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Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 6600 NJ Atlantic-C Rainfall events imported from "NRCS-Rain.txt" for 7614 PA Chester-C Rainfall events imported from "NRCS-Rain.txt" for 6617 NJ Somerset-C Rainfall events imported from "Site 4_20240402.hcp"

Site1HillsboroughMunicpComplex_20240628 Prepared by Rutgers Cooperative Extension Water Resources Program HydroCAD® 10.10-7c s/n 03601 © 2022 HydroCAD Software Solutions LLC

| Event# | Event | Storm Type | Curve | Mode | Duration | B/B | Depth | AMC |
|--------|-------------------|------------|-------|---------|----------|-----|----------|-----|
| | Name | | | | (hours) | | (inches) | |
| 1 | 2-Year _2100 | NOAA 24-hr | С | Default | 24.00 | 1 | 3.97 | 2 |
| 2 | 2-Year _Current | NOAA 24-hr | С | Default | 24.00 | 1 | 3.34 | 2 |
| 3 | 10-Year _2100 | NOAA 24-hr | С | Default | 24.00 | 1 | 6.21 | 2 |
| 4 | 10-Year _Current | NOAA 24-hr | С | Default | 24.00 | 1 | 5.16 | 2 |
| 5 | 100-Year _2100 | NOAA 24-hr | С | Default | 24.00 | 1 | 12.15 | 2 |
| 6 | 100-Year _Current | NOAA 24-hr | С | Default | 24.00 | 1 | 8.95 | 2 |

Rainfall Events Listing (selected events)

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Area Listing (all nodes)

| Area | CN | Description |
|-----------|----|--|
| (sq-ft) | | (subcatchment-numbers) |
| 13,302 | 79 | 50-75% Grass cover, Fair, HSG C (3Sa) |
| 2,767 | 70 | Brush (fair) C (8S) |
| 63,031 | 77 | Brush (fair) D (8S) |
| 159,121 | 65 | Brush (good) C (8S, 9S) |
| 64,708 | 73 | Brush (good) D (8S) |
| 966 | 98 | Gravel surface, HSG C - Path (3Sa) |
| 596,450 | 98 | Impervious (1S, 1Sb, 2S, 3S, 3Sc, 4S, 4Sb, 5S, 5Sb, 6S, 7S, 8S, 9S, 31S) |
| 3,630 | 98 | Impervious - Road / Sidewalk (3Sb) |
| 10,303 | 98 | Impervious - Roof top (3Sb) |
| 14,584 | 98 | Impervious Parking Lot (1Sa) |
| 9,716 | 98 | Impervious Parking lot (5Sa) |
| 14,019 | 98 | Impervious Parkinglot (4Sa) |
| 6,507 | 98 | Impervious Roof Top (3Sa) |
| 5,114 | 98 | Impervious Sidewalk (3Sa) |
| 2,484 | 74 | OPen Space (Good) C - Portion from DA1 (1Sa) |
| 22,588 | 79 | Open Space (Fair) C (5S, 5Sa, 5Sb) |
| 108,641 | 79 | Open Space (fair) C (6S, 7S, 31S) |
| 433,830 | 74 | Open Space (good) C (2S, 5S, 5Sb, 6S, 7S, 9S) |
| 100,978 | 79 | Open space (Fair) C (2S, 3S, 3Sc, 8S) |
| 6,912 | 79 | Open space (fair) C (1S, 1Sb, 4S, 4Sb) |
| 5,569 | 79 | Open space (fair) C - Portion from DA 9 the field (1Sa) |
| 10,350 | 79 | Open space (fair) C _from DA 8 (4Sa) |
| 31,153 | 84 | Open space (fair) D (4S, 4Sb, 8S) |
| 118,684 | 74 | Open space (good) C (1S, 1Sb, 3S, 3Sb, 3Sc, 4S, 4Sb, 8S) |
| 9,087 | 80 | Open space (good) D (8S) |
| 10,448 | 79 | Open spcae (fair) C (9S) |
| 1,824,942 | 83 | TOTAL AREA |

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Soil Listing (all nodes)

| Area | Soil | Subcatchment |
|-----------|-------|--|
| (sq-ft) | Group | Numbers |
| 0 | HSG A | |
| 0 | HSG B | |
| 14,268 | HSG C | 3Sa |
| 0 | HSG D | |
| 1,810,674 | Other | 1S, 1Sa, 1Sb, 2S, 3S, 3Sa, 3Sb, 3Sc, 4S, 4Sa, 4Sb, 5S, 5Sa, 5Sb, 6S, 7S, |
| | | 8S, 9S, 31S |
| 1,824,942 | | TOTAL AREA |

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| HSG-A | HSG-B | HSG-C | HSG-D | Other | Total | Ground |
|---------|---------|---------|---------|---------|---------|--------------------------------|
| (sq-ft) | (sq-ft) | (sq-ft) | (sq-ft) | (sq-ft) | (sq-ft) | Cover |
| 0 | 0 | 13,302 | 0 | 0 | 13,302 | 50-75% Grass |
| | | | | | | cover, Fair |
| 0 | 0 | 0 | 0 | 2,767 | 2,767 | Brush (fair) C |
| 0 | 0 | 0 | 0 | 63,031 | 63,031 | Brush (fair) D |
| 0 | 0 | 0 | 0 | 159,121 | 159,121 | Brush (good) C |
| 0 | 0 | 0 | 0 | 64,708 | 64,708 | Brush (good) D |
| 0 | 0 | 966 | 0 | 0 | 966 | Gravel surface |
| 0 | 0 | 0 | 0 | 596,450 | 596,450 | Impervious |
| 0 | 0 | 0 | 0 | 3,630 | 3,630 | Impervious - |
| | | | | | | Road / Sidewalk |
| 0 | 0 | 0 | 0 | 10,303 | 10,303 | Impervious - Roof |
| | | | | | | top |
| 0 | 0 | 0 | 0 | 14,584 | 14,584 | Impervious |
| | | | | | | Parking Lot |
| 0 | 0 | 0 | 0 | 9,716 | 9,716 | Impervious |
| | | | | | | Parking lot |
| 0 | 0 | 0 | 0 | 14,019 | 14,019 | Impervious |
| | | | | | | Parkinglot |
| 0 | 0 | 0 | 0 | 6,507 | 6,507 | Impervious Roof |
| _ | | _ | | | | Тор |
| 0 | 0 | 0 | 0 | 5,114 | 5,114 | Impervious |
| | | | | | o (o) | Sidewalk |
| 0 | 0 | 0 | 0 | 2,484 | 2,484 | OPen Space |
| | | | | | | (Good) C - |
| 0 | 0 | 0 | 0 | 00 500 | 00 500 | Portion from DA1 |
| 0 | 0 | 0 | 0 | 22,588 | 22,588 | Open Space |
| 0 | 0 | 0 | 0 | 100 644 | 100 644 | (Fair) C Onen Snees (feir) |
| 0 | 0 | 0 | 0 | 100,041 | 100,041 | Open Space (iair) |
| 0 | 0 | 0 | 0 | 122 020 | 122 020 | C Open Space |
| 0 | 0 | 0 | 0 | 433,830 | 433,830 | (good) C |
| 0 | 0 | 0 | 0 | 100 078 | 100 078 | (yoou) C Open space |
| 0 | 0 | 0 | 0 | 100,978 | 100,970 | (Eair) C |
| 0 | 0 | 0 | 0 | 6 912 | 6 912 | (I all) C Open space (fair) |
| 0 | 0 | 0 | 0 | 0,012 | 0,012 | C. |
| 0 | 0 | 0 | 0 | 5 569 | 5 569 | Onen snace (fair) |
| 0 | 0 | Ŭ | 0 | 0,000 | 0,000 | C - Portion from |
| | | | | | | DA 9 the field |
| 0 | 0 | 0 | 0 | 10.350 | 10.350 | Open space (fair) |
| 5 | 3 | Ũ | 5 | , | , | C from DA 8 |
| 0 | 0 | 0 | 0 | 31.153 | 31.153 | Open space (fair) |
| - | - | - | - | , - | , - | D , , , , , |

Ground Covers (all nodes)

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| HSG-A (sq-ft) | HSG-B (sq-ft) | HSG-C (sq-ft) | HSG-D (sq-ft) | Other (sq-ft) | Total (sq-ft) | Ground Cover |
|------------------|------------------|------------------|------------------|------------------|------------------|------------------------|
| 0 | 0 | 0 | 0 | 118,684 | 118,684 | Open space (good) C |
| 0 | 0 | 0 | 0 | 9,087 | 9,087 | Open space (good) D |
| 0 | 0 | 0 | 0 | 10,448 | 10,448 | Open spcae (fair) C |
| 0 | 0 | 14,268 | 0 | 1,810,674 | 1,824,942 | TOTAL AREA |

Ground Covers (all nodes) (continued)

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| Line# | Node Number | In-Invert (feet) | Out-Invert (feet) | Length (feet) | Slope (ft/ft) | n | Width (inches) | Diam/Height (inches) | Inside-Fill (inches) |
|-------|----------------|---------------------|----------------------|------------------|------------------|-------|-------------------|-------------------------|-------------------------|
| 1 | 1P | 98.15 | 98.09 | 11.0 | 0.0055 | 0.020 | 0.0 | 4.0 | 0.0 |
| 2 | 1P | 98.25 | 98.15 | 20.0 | 0.0050 | 0.020 | 0.0 | 4.0 | 0.0 |
| 3 | 2P | 92.17 | 90.37 | 359.0 | 0.0050 | 0.020 | 0.0 | 6.0 | 0.0 |
| 4 | 3P | 92.17 | 90.37 | 359.0 | 0.0050 | 0.020 | 0.0 | 6.0 | 0.0 |
| 5 | 4P | 99.15 | 99.09 | 11.0 | 0.0055 | 0.020 | 0.0 | 4.0 | 0.0 |
| 6 | 4P | 99.25 | 99.15 | 20.0 | 0.0050 | 0.020 | 0.0 | 4.0 | 0.0 |
| 7 | 5P | 99.15 | 99.09 | 11.0 | 0.0055 | 0.020 | 0.0 | 4.0 | 0.0 |
| 8 | 5P | 99.25 | 99.15 | 20.0 | 0.0050 | 0.020 | 0.0 | 4.0 | 0.0 |
| 9 | 6P | 92.17 | 90.37 | 359.0 | 0.0050 | 0.020 | 0.0 | 6.0 | 0.0 |
| 10 | 7P | 98.15 | 98.09 | 11.0 | 0.0055 | 0.020 | 0.0 | 4.0 | 0.0 |
| 11 | 7P | 98.25 | 98.15 | 20.0 | 0.0050 | 0.020 | 0.0 | 4.0 | 0.0 |
| 12 | 8P | 92.17 | 90.37 | 359.0 | 0.0050 | 0.020 | 0.0 | 6.0 | 0.0 |
| 13 | 9P | 98.15 | 98.09 | 11.0 | 0.0055 | 0.020 | 0.0 | 4.0 | 0.0 |
| 14 | 9P | 98.25 | 98.15 | 20.0 | 0.0050 | 0.020 | 0.0 | 4.0 | 0.0 |
| 15 | 10P | 92.17 | 90.37 | 359.0 | 0.0050 | 0.020 | 0.0 | 6.0 | 0.0 |
| 16 | 11P | 98.15 | 98.09 | 11.0 | 0.0055 | 0.020 | 0.0 | 4.0 | 0.0 |
| 17 | 11P | 98.25 | 98.15 | 20.0 | 0.0050 | 0.020 | 0.0 | 4.0 | 0.0 |
| 18 | 12P | 92.17 | 90.37 | 359.0 | 0.0050 | 0.020 | 0.0 | 6.0 | 0.0 |

Pipe Listing (all nodes)

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| Subcatchment1S: DA1: CN w/ IC | Runoff Area=56,173 sf 73.47% Impervious Runoff Depth=3.18" Flow Length=361' Tc=14.3 min CN=75/98 Runoff=3.57 cfs 14,888 cf |
|-------------------------------------|---|
| Subcatchment 1Sa: Existing RG 1_W | Vest_ Runoff Area=22,637 sf 64.43% Impervious Runoff Depth=3.04" Flow Length=361' Tc=14.3 min CN=77/98 Runoff=1.39 cfs 5,740 cf |
| Subcatchment1Sb: DA1: CN w/ IC | Runoff Area=39,105 sf 68.25% Impervious Runoff Depth=3.07" Flow Length=361' Tc=14.3 min CN=75/98 Runoff=2.41 cfs 10,008 cf |
| Subcatchment 2S: DA 2: CN w/ IC are | eas Runoff Area=58,249 sf 86.46% Impervious Runoff Depth=3.46" Flow Length=391' Tc=7.0 min CN=76/98 Runoff=5.01 cfs 16,804 cf |
| Subcatchment3S: DA 3: CN w/ IC | Runoff Area=158,623 sf 63.48% Impervious Runoff Depth=3.00" Flow Length=441' Tc=8.3 min CN=76/98 Runoff=11.58 cfs 39,625 cf |
| Subcatchment3Sa: Existing RG 2 Fr | ont DA Runoff Area=25,889 sf 48.62% Impervious Runoff Depth=2.81" Tc=8.3 min CN=79/98 Runoff=1.81 cfs 6,067 cf |
| Subcatchment3Sb: RG 1 DA | Runoff Area=21,388 sf 65.14% Impervious Runoff Depth=2.98" Flow Length=441' Tc=8.3 min CN=74/98 Runoff=1.55 cfs 5,315 cf |
| Subcatchment3Sc: DA 3: CN w/ IC a | reas Runoff Area=111,346 sf 66.62% Impervious Runoff Depth=3.04" Flow Length=441' Tc=8.3 min CN=75/98 Runoff=8.20 cfs 28,182 cf |
| Subcatchment4S: DA 4: CN w/ IC | Runoff Area=86,816 sf 90.62% Impervious Runoff Depth=3.54" Flow Length=143' Tc=8.4 min CN=75/98 Runoff=7.27 cfs 25,603 cf |
| Subcatchment4Sa: RG 4 DA | Runoff Area=24,369 sf 57.53% Impervious Runoff Depth=2.97" Flow Length=143' Tc=8.4 min CN=79/98 Runoff=1.77 cfs 6,036 cf |
| Subcatchment4Sb: DA 4: CN w/ IC a | reas Runoff Area=72,797 sf 88.81% Impervious Runoff Depth=3.50" Flow Length=143' Tc=8.4 min CN=75/98 Runoff=6.04 cfs 21,240 cf |
| Subcatchment5S: DA 5: CN w/ IC | Runoff Area=78,058 sf 72.85% Impervious Runoff Depth=3.21" Flow Length=310' Tc=11.5 min CN=77/98 Runoff=5.42 cfs 20,859 cf |
| Subcatchment 5Sa: RG 3 DA | Runoff Area=19,898 sf 48.83% Impervious Runoff Depth=2.82" Flow Length=310' Tc=11.5 min CN=79/98 Runoff=1.25 cfs 4,670 cf |
| Subcatchment 5Sb: DA 5: CN w/ IC a | reas Runoff Area=58,163 sf 81.07% Impervious Runoff Depth=3.34" Flow Length=310' Tc=11.5 min CN=75/98 Runoff=4.17 cfs 16,185 cf |
| Subcatchment6S: DA 6: CN w/ IC are | eas Runoff Area=32,033 sf 45.19% Impervious Runoff Depth=2.75" Flow Length=276' Tc=14.0 min CN=79/98 Runoff=1.84 cfs 7,343 cf |
| Subcatchment7S: DA 7 (Offsite Sout | th): Runoff Area=107,001 sf 18.84% Impervious Runoff Depth=2.22" Flow Length=309' Tc=14.5 min CN=78/98 Runoff=5.03 cfs 19,757 cf |

Site1HillsboroughMunicpComplex_20240628 NOAA 24-hr C 2-Year_2100 Rainfall=3.97" Prepared by Rutgers Cooperative Extension Water Resources Program Printed 6/29/2024 HydroCAD® 10.10-7c s/n 03601 © 2022 HydroCAD Software Solutions LLC Page 10 Subcatchment 8S: DA 8 (Offsite North): CN Runoff Area=340,642 sf 1.94% Impervious Runoff Depth=1.62" Flow Length=976' Tc=19.4 min CN=74/98 Runoff=10.54 cfs 45,879 cf Runoff Area=479,720 sf 0.89% Impervious Runoff Depth=1.53" Subcatchment9S: DA 9 (Offsite Field Flow Length=1,468' Tc=30.4 min CN=73/98 Runoff=11.17 cfs 60,998 cf Subcatchment 31S: RG 2 DA Runoff Area=32,035 sf 32.46% Impervious Runoff Depth=2.52" Flow Length=276' Tc=14.0 min CN=79/98 Runoff=1.72 cfs 6,733 cf Avg. Flow Depth=0.20' Max Vel=1.94 fps Inflow=1.39 cfs 5,740 cf Reach 1R: Existing Bioswale West 1 n=0.035 L=33.0' S=0.0227 '/' Capacity=7.36 cfs Outflow=1.38 cfs 5,740 cf Avg. Flow Depth=0.29' Max Vel=2.36 fps Inflow=1.25 cfs 4,670 cf Reach 2R: Bioswale E 1 RG 3 n=0.035 L=35.0' S=0.0286 '/' Capacity=4.02 cfs Outflow=1.24 cfs 4,670 cf Pond 1P: Exising Rain Garden 1 West Peak Elev=100.38' Storage=1,831 cf Inflow=1.38 cfs 5,740 cf Primary=0.27 cfs 4,082 cf Secondary=1.13 cfs 1,483 cf Outflow=1.40 cfs 5,565 cf Pond 2P: Underground Storage w/ Porous Peak Elev=97.33' Storage=13,272 cf Inflow=3.79 cfs 15,573 cf Primary=0.02 cfs 3,613 cf Secondary=0.00 cfs 0 cf Outflow=0.02 cfs 3,613 cf

Pond 3P: Underground Storage w/ Porous Peak Elev=97.29' Storage=15,715 cf Inflow=5.01 cfs 16,804 cf Primary=0.01 cfs 3,642 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 3,642 cf

Pond 4P: Existing Rain Garden 2 Front Peak Elev=101.21' Storage=3,140 cf Inflow=1.81 cfs 6,067 cf Primary=0.20 cfs 4,306 cf Secondary=0.27 cfs 633 cf Outflow=0.47 cfs 4,938 cf

Pond 5P: Proposed Rain Garden 1 (South Peak Elev=101.31' Storage=2,466 cf Inflow=1.55 cfs 5,315 cf Primary=0.24 cfs 3,954 cf Secondary=0.75 cfs 810 cf Outflow=1.00 cfs 4,764 cf

Pond 6P: Underground Storage w/ Porous Peak Elev=97.18' Storage=34,307 cf Inflow=8.38 cfs 37,884 cf Primary=0.01 cfs 3,591 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 3,591 cf

Pond 7P: Proposed Rain Garden 4 (North) Peak Elev=100.53' Storage=2,453 cf Inflow=1.77 cfs 6,036 cf Primary=0.32 cfs 4,289 cf Secondary=2.15 cfs 1,518 cf Outflow=2.47 cfs 5,806 cf

Pond 8P: Underground Storage w/ Porous Peak Elev=97.21' Storage=24,597 cf Inflow=7.67 cfs 27,046 cf Primary=0.01 cfs 3,618 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 3,618 cf

Pond 9P: Proposed Rain Garden 3 (North Peak Elev=100.34' Storage=1,751 cf Inflow=1.24 cfs 4,670 cf Primary=0.25 cfs 3,651 cf Secondary=0.86 cfs 884 cf Outflow=1.12 cfs 4,535 cf

Pond 10P: Underground Storage w/ Porous Peak Elev=97.23' Storage=18,421 cf Inflow=4.77 cfs 20,720 cf Primary=0.01 cfs 3,623 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 3,623 cf

Pond 11P: Proposed Rain Garden 2 (East) Peak Elev=100.35' Storage=3,267 cf Inflow=1.84 cfs 7,343 cf Primary=0.27 cfs 5,879 cf Secondary=0.97 cfs 1,248 cf Outflow=1.24 cfs 7,127 cf

Pond 12P: Underground Storage w/ Porous Peak Elev=96.76' Storage=4,178 cf Inflow=1.24 cfs 7,127 cf Primary=0.01 cfs 3,224 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 3,224 cf

Link 1L: Offsite Flows

Inflow=24.16 cfs 126,634 cf Primary=24.16 cfs 126,634 cf

Total Runoff Area = 1,824,942 sf Runoff Volume = 361,933 cf Average Runoff Depth = 2.38" 63.76% Pervious = 1,163,653 sf 36.24% Impervious = 661,289 sf

Summary for Subcatchment 1S: DA1: CN w/ IC areas_original

Runoff = 3.57 cfs @ 12.22 hrs, Volume= 14,888 cf, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| | A | rea (sf) | CN | Description | | |
|---|-------|----------|---------|-------------|--------------|--|
| * | | 2,053 | 79 | Open space | e (fair) C | |
| * | | 12,848 | 74 | Open space | e (good) C | |
| * | | 41,272 | 98 | Impervious | , | |
| | | 56,173 | 92 | Weighted A | verage | |
| | | 14,901 | 75 | 26.53% Pei | vious Area | |
| | | 41,272 | 98 | 73.47% Imp | pervious Are | ea |
| | Тс | Longth | Slone | Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | Description |
| | 12.2 | 100 | 0.0109 | 0.14 | | Sheet Flow, Sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 0.2 | 33 | 0.0280 | 2.69 | | Shallow Concentrated Flow, SCF - unpaved |
| | | | | | | Unpaved Kv= 16.1 fps |
| | 1.9 | 228 | 0.0095 | 1.98 | | Shallow Concentrated Flow, SCF - Paved parking lot |
| _ | | | | | | Paved Kv= 20.3 fps |
| | 14.3 | 361 | Total | | | |

Subcatchment 1S: DA1: CN w/ IC areas_original



Summary for Subcatchment 1Sa: Existing RG 1_West_ DA

Runoff = 1.39 cfs @ 12.22 hrs, Volume= Routed to Reach 1R : Existing Bioswale West 1 5,740 cf, Depth= 3.04"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| | A | rea (sf) | CN | Description | | | | | | | |
|---|-------------|------------------|------------------|--|-------------------|--|--|--|--|--|--|
| * | | 5,569 | 79 | 79 Open space (fair) C - Portion from DA 9 the field | | | | | | | |
| * | | 14,584 | 98 | mpervious Parking Lot | | | | | | | |
| * | | 2,484 | 74 | OPen Spac | e (Good) C | C - Portion from DA1 | | | | | |
| | | 22,637 | 91 | Weighted A | verage | | | | | | |
| | | 8,053 | 77 | 35.57% Pei | rvious Area | | | | | | |
| | | 14,584 | 98 | 64.43% Imp | pervious Ar | ea | | | | | |
| | Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description | | | | | |
| | 12.2 | 100 | 0.0109 | 0.14 | | Sheet Flow, Sheet flow Grass: Short_n= 0 150_P2= 3 34" | | | | | |
| | 0.2 | 33 | 0.0280 | 2.69 | | Shallow Concentrated Flow, SCF - unpaved Unpaved Ky= 16.1 fps | | | | | |
| | 1.9 | 228 | 0.0095 | 1.98 | | Shallow Concentrated Flow, SCF - Paved parking lot Paved Kv= 20.3 fps | | | | | |
| | 44.0 | 0.04 | T () | | | | | | | | |

14.3 361 Total

Subcatchment 1Sa: Existing RG 1_West_ DA



Summary for Subcatchment 1Sb: DA1: CN w/ IC areas_Remaining

Runoff = 2.41 cfs @ 12.22 hrs, Volume= 10,008 cf, Depth= 3.07" Routed to Pond 2P : Underground Storage w/ Porous Pavement 1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| _ | A | rea (sf) | CN | Description | | |
|---------------------------------|--------------|----------|--------|-------------|-------------|--|
| * | | 2,053 | 79 | Open space | e (fair) C | |
| * | | 10,364 | 74 | Open space | e (good) C | |
| * | | 26,688 | 98 | Impervious | (0) | |
| _ | | 39,105 | 91 | Weighted A | verage | |
| | | 12,417 | 75 | 31.75% Pei | rvious Area | |
| 26,688 98 68.25% Impervious Are | | | | | pervious Ar | ea |
| | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description |
| | <u>(min)</u> | (feet) | (ft/ft |) (ft/sec) | (cfs) | |
| | 12.2 | 100 | 0.0109 | 9 0.14 | | Sheet Flow, Sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 0.2 | 33 | 0.0280 |) 2.69 | | Shallow Concentrated Flow, SCF - unpaved |
| | | | | | | Unpaved Kv= 16.1 fps |
| | 1.9 | 228 | 0.0095 | 5 1.98 | | Shallow Concentrated Flow, SCF - Paved parking lot |
| _ | | | | | | Paved Kv= 20.3 fps |
| | 14.3 | 361 | Total | | | |

Subcatchment 1Sb: DA1: CN w/ IC areas_Remaining



Summary for Subcatchment 2S: DA 2: CN w/ IC areas

Runoff = 5.01 cfs @ 12.14 hrs, Volume= 16,804 cf, Depth= 3.46" Routed to Pond 3P : Underground Storage w/ Porous Pavement 2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| _ | A | rea (sf) | CN | Description | | |
|----------------------------------|-------|----------|--------|-------------|-------------|--|
| * | | 3,767 | 79 | Open space | e (Fair) C | |
| * | | 4,118 | 74 | Open Spac | e (good) C | |
| * | | 50,364 | 98 | Impervious | , | |
| 58,249 95 Weighted Average | | | | | verage | |
| 7,885 76 13.54% Pervious Area | | | | | | |
| 50,364 98 86.46% Impervious Area | | | | | pervious Ar | ea |
| | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description |
| _ | (min) | (feet) | (ft/ft | i) (ft/sec) | (cfs) | |
| | 4.8 | 18 | 0.0037 | 7 0.06 | | Sheet Flow, Sheet flow - grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 2.2 | 373 | 0.0186 | 6 2.77 | | Shallow Concentrated Flow, SCF _ paved |
| _ | | | | | | Paved Kv= 20.3 fps |
| | 7.0 | 391 | Total | | | |

Subcatchment 2S: DA 2: CN w/ IC areas



Summary for Subcatchment 3S: DA 3: CN w/ IC areas_Original

Runoff = 11.58 cfs @ 12.15 hrs, Volume= 39,625 cf, Depth= 3.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| | A | rea (sf) | CN | Description | | | | | |
|---|---------|----------|--------|------------------------|------------|--|--|--|--|
| * | | 18,715 | 79 | Open space | e (Fair) C | | | | |
| * | | 39,208 | 74 | Open space | e (good) C | | | | |
| * | 1 | 00,700 | 98 | Impervious | (0) | | | | |
| _ | 1 | 58,623 | 90 | Weighted Average | | | | | |
| | | 57,923 | 76 | 36.52% Pervious Area | | | | | |
| | 100,700 | | 98 | 63.48% Impervious Area | | | | | |
| | | | | | | | | | |
| | Tc | Length | Slope | e Velocity | Capacity | Description | | | |
| _ | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | | | |
| | 5.8 | 83 | 0.0489 | 0.24 | | Sheet Flow, sheet flow - grass | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| | 2.5 | 358 | 0.0138 | 3 2.38 | | Shallow Concentrated Flow, SCF - paved | | | |
| | | | | | | Paved Kv= 20.3 fps | | | |
| | 8.3 | 441 | Total | | | | | | |

Subcatchment 3S: DA 3: CN w/ IC areas_Original



Summary for Subcatchment 3Sa: Existing RG 2 Front DA

Runoff = 1.81 cfs @ 12.15 hrs, Volume= 6,067 cf, Depth= 2.81" Routed to Pond 4P : Existing Rain Garden 2 Front

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| | Area (sf) | CN | Description | | | | | | |
|----|-----------|--------------|---|---------------------|--|--|--|--|--|
| * | 6,507 | 98 | Impervious Roof Top | Impervious Roof Top | | | | | |
| * | 966 | 98 | Gravel surface, HSG C - Path | | | | | | |
| * | 5,114 | 98 | npervious Sidewalk | | | | | | |
| | 13,302 | 79 | 50-75% Grass cover, Fair, HSG C | | | | | | |
| | 25,889 | 88 | Weighted Average | | | | | | |
| | 13,302 | 79 | 51.38% Pervious Area | | | | | | |
| | 12,587 | 98 | 48.62% Impervious Area | | | | | | |
| (m | Tc Length | Slop (ft/ | be Velocity Capacity Description (ft) (ft/sec) (cfs) | | | | | | |
| | 8.3 | (13 | Direct Entry, | | | | | | |





Summary for Subcatchment 3Sb: RG 1 DA

Runoff = 1.55 cfs @ 12.15 hrs, Volume= 5,315 cf, Depth= 2.98" Routed to Pond 5P : Proposed Rain Garden 1 (South West)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| | A | rea (sf) | CN | Description | | | | | | |
|---------------------------------|-------|----------|--------|-------------|---------------------|--|--|--|--|--|
| * | | 7,455 | 74 | Open space | Open space (good) C | | | | | |
| * | | 10,303 | 98 | Impervious | - Roof top | | | | | |
| * | | 3,630 | 98 | Impervious | - Road / Si | dewalk | | | | |
| | | 21,388 | 90 | Weighted A | verage | | | | | |
| 7,455 74 34.86% Pervious Area | | | | | | | | | | |
| 13,933 98 65.14% Impervious Are | | | | | | ea | | | | |
| | | | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | | |
| | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | | | | |
| | 5.8 | 83 | 0.048 | 9 0.24 | | Sheet Flow, sheet flow - grass | | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | | |
| | 2.5 | 358 | 0.013 | 3 2.38 | | Shallow Concentrated Flow, SCF - paved | | | | |
| | | | | | | Paved Kv= 20.3 fps | | | | |
| | 8.3 | 441 | Total | | | | | | | |

Subcatchment 3Sb: RG 1 DA



Summary for Subcatchment 3Sc: DA 3: CN w/ IC areas Remaining

Runoff = 8.20 cfs @ 12.15 hrs, Volume= 28,182 cf, Depth= 3.04" Routed to Pond 6P : Underground Storage w/ Porous Pavement 3

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| | A | rea (sf) | CN | Description | | | | | |
|---|----------------------------------|----------|--------|----------------------|-------------|--|--|--|--|
| * | | 5,413 | 79 | Open space | e (Fair) C | | | | |
| * | | 31,753 | 74 | Open space | e (good) C | | | | |
| * | | 74,180 | 98 | Impervious | , | | | | |
| _ | 1 | 11,346 | 90 | Weighted A | verage | | | | |
| | | 37,166 | 75 | 33.38% Pervious Area | | | | | |
| | 74,180 98 66.62% Impervious Area | | | | pervious Ar | ea | | | |
| | | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | |
| _ | (min) | (feet) | (ft/ft | :) (ft/sec) | (cfs) | | | | |
| | 5.8 | 83 | 0.0489 | 9 0.24 | | Sheet Flow, sheet flow - grass | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| | 2.5 | 358 | 0.0138 | 3 2.38 | | Shallow Concentrated Flow, SCF - paved | | | |
| | | | | | | Paved Kv= 20.3 fps | | | |
| | 8.3 | 441 | Total | | | | | | |

Subcatchment 3Sc: DA 3: CN w/ IC areas Remaining



Summary for Subcatchment 4S: DA 4: CN w/ IC areas_original

Runoff = 7.27 cfs @ 12.15 hrs, Volume= 25,603 cf, Depth= 3.54"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| | A | rea (sf) | CN | Description | | | | | |
|---|-------|----------|--------|-----------------------|---------------------|--|--|--|--|
| * | | 1,403 | 79 | 9 Open space (fair) C | | | | | |
| * | | 446 | 84 | Open space | Open space (fair) D | | | | |
| * | | 6,298 | 74 | Open space | e (good) C | | | | |
| * | | 78,669 | 98 | Impervious | | | | | |
| | | 86,816 | 96 | Weighted A | verage | | | | |
| | | 8,147 | 75 | 9.38% Perv | vious Area | | | | |
| | | 78,669 | 98 | 90.62% Imp | pervious Are | ea | | | |
| | | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | |
| _ | (min) | (feet) | (ft/ft | t) (ft/sec) | (cfs) | | | | |
| | 7.9 | 67 | 0.0144 | 4 0.14 | | Sheet Flow, sheet flow - grass | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| | 0.5 | 76 | 0.015 | 5 2.53 | | Shallow Concentrated Flow, SCF - Paved | | | |
| | | | | | | Paved Kv= 20.3 fps | | | |
| | 8.4 | 143 | Total | | | | | | |

Subcatchment 4S: DA 4: CN w/ IC areas_original



Summary for Subcatchment 4Sa: RG 4 DA

Runoff = 1.77 cfs @ 12.15 hrs, Volume= 6,036 cf, Depth= 2.97" Routed to Pond 7P : Proposed Rain Garden 4 (North)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| | A | rea (sf) | CN | Description | | | | | |
|---|-------------|------------------|-----------------|---------------------------------|-------------------|---|--|--|--|
| * | | 10,350 | 79 | 9 Open space (fair) C from DA 8 | | | | | |
| * | | 14,019 | 98 | Impervious | Parkinglot | | | | |
| | | 24,369 | 90 | Weighted A | verage | | | | |
| 10,350 79 42.47% Pervious Area 14,019 98 57.53% Impervious Are | | | | | | | | | |
| | | | | | | ea | | | |
| | Tc (min) | Length (feet) | Slope (ft/ft | e Velocity) (ft/sec) | Capacity (cfs) | Description | | | |
| | 7.9 | 67 | 0.0144 | 4 0.14 | | Sheet Flow, sheet flow - grass Grass: Short n= 0.150 P2= 3.34" | | | |
| | 0.5 | 76 | 0.0155 | 5 2.53 | | Shallow Concentrated Flow, SCF - Paved Paved Kv= 20.3 fps | | | |
| | 0.4 | 110 | T . 4 . 1 | | | | | | |

8.4 143 Total

Subcatchment 4Sa: RG 4 DA



Summary for Subcatchment 4Sb: DA 4: CN w/ IC areas

Runoff = 6.04 cfs @ 12.15 hrs, Volume= 21,240 cf, Depth= 3.50" Routed to Pond 8P : Underground Storage w/ Porous Pavement 4

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| | A | rea (sf) | CN | Description | | | | | |
|---|------|----------|--------|-------------|---------------------|--|--|--|--|
| * | | 1,403 | 79 | Open space | e (fair) C | | | | |
| * | | 446 | 84 | Open space | Dpen space (fair) D | | | | |
| * | | 6,298 | 74 | Open space | Dpen space (good) C | | | | |
| * | | 64,650 | 98 | Impervious | , | | | | |
| | | 72,797 | 95 | Weighted A | verage | | | | |
| | | 8,147 | 75 | 11.19% Pe | rvious Area | | | | |
| | | 64,650 | 98 | 88.81% Imp | pervious Are | ea | | | |
| | | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | |
| (| min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | | | |
| | 7.9 | 67 | 0.0144 | 4 0.14 | | Sheet Flow, sheet flow - grass | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| | 0.5 | 76 | 0.015 | 5 2.53 | | Shallow Concentrated Flow, SCF - Paved | | | |
| | | | | | | Paved Kv= 20.3 fps | | | |
| | 8.4 | 143 | Total | | | | | | |

Subcatchment 4Sb: DA 4: CN w/ IC areas



Summary for Subcatchment 5S: DA 5: CN w/ IC areas_Original

Runoff = 5.42 cfs @ 12.19 hrs, Volume= 20,859 cf, Depth= 3.21"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| | A | rea (sf) | CN | Description | | |
|---|----------------------------|----------|---------|-------------|--------------|--|
| * | | 11,294 | 79 | Open Spac | | |
| * | | 9,899 | 74 | Open Spac | e (good) C | |
| * | | 56,865 | 98 | Impervious | , | |
| | 78,058 92 Weighted Average | | | | | |
| | | 21,193 | 77 | 27.15% Pei | vious Area | |
| | | 56,865 | 98 | 72.85% Imp | pervious Are | ea |
| | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | |
| | 8.7 | 64 | 0.0105 | 0.12 | | Sheet Flow, Sheet flow -grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 1.3 | 179 | 0.0129 | 2.31 | | Shallow Concentrated Flow, SCF - paved |
| | | | | | | Paved Kv= 20.3 fps |
| | 1.5 | 67 | 0.0120 | 0.77 | | Shallow Concentrated Flow, SCF _ grass |
| | | | | | | Short Grass Pasture Kv= 7.0 fps |
| | 11.5 | 310 | Total | | | |

Subcatchment 5S: DA 5: CN w/ IC areas_Original



Summary for Subcatchment 5Sa: RG 3 DA

Runoff = 1.25 cfs @ 12.19 hrs, Volume= 4,670 cf, Depth= 2.82" Routed to Reach 2R : Bioswale E 1 RG 3

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| _ | A | vrea (sf) | CN | Description | | |
|---|-------|-----------|---------|-------------|-------------|--|
| * | | 10,182 | 79 | Open Spac | e (Fair) C | |
| * | | 9,716 | 98 | Impervious | Parking lot | |
| | | 19,898 | 88 | Weighted A | verage | |
| | | 10,182 | 79 | 51.17% Pei | rvious Area | |
| | | 9,716 | 98 | 48.83% Imp | pervious Ar | ea |
| | _ | | | | | |
| | Тс | Length | Slope | · Velocity | Capacity | Description |
| _ | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | |
| | 8.7 | 64 | 0.0105 | 0.12 | | Sheet Flow, Sheet flow -grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 1.3 | 179 | 0.0129 | 2.31 | | Shallow Concentrated Flow, SCF - paved |
| | | | | | | Paved Kv= 20.3 fps |
| | 1.5 | 67 | 0.0120 | 0.77 | | Shallow Concentrated Flow, SCF _ grass |
| | | | | | | Short Grass Pasture Kv= 7.0 fps |
| | | | - | | | |

11.5 310 Total

Subcatchment 5Sa: RG 3 DA



Summary for Subcatchment 5Sb: DA 5: CN w/ IC areas

Runoff = 4.17 cfs @ 12.19 hrs, Volume= 16,185 cf, Depth= 3.34" Routed to Pond 10P : Underground Storage w/ Porous Pavement 5

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| _ | A | rea (sf) | CN I | Description | | | | |
|---|---------------------------------|----------|---------|---------------------|------------|--|--|--|
| * | | 1,112 | 79 (| Open Spac | e (Fair) C | | | |
| * | | 9,899 | 74 (| Open Space (good) C | | | | |
| * | | 47,152 | 98 I | mpervious | | | | |
| | 58,163 94 Weighted Average | | | | | | | |
| | 11,011 75 18.93% Pervious Area | | | | | | | |
| | 47,152 98 81.07% Impervious Are | | | | | ea | | |
| | | | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description | | |
| | <u>(min)</u> | (feet) | (ft/ft) | (ft/sec) | (cfs) | | | |
| | 8.7 | 64 | 0.0105 | 0.12 | | Sheet Flow, Sheet flow -grass | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | |
| | 1.3 | 179 | 0.0129 | 2.31 | | Shallow Concentrated Flow, SCF - paved | | |
| | | | | | | Paved Kv= 20.3 fps | | |
| | 1.5 | 67 | 0.0120 | 0.77 | | Shallow Concentrated Flow, SCF _ grass | | |
| | | | | | | Short Grass Pasture Kv= 7.0 fps | | |

11.5 310 Total

Subcatchment 5Sb: DA 5: CN w/ IC areas



Summary for Subcatchment 6S: DA 6: CN w/ IC areas

Runoff = 1.84 cfs @ 12.22 hrs, Volume= 7,343 cf, Depth= 2.75" Routed to Pond 11P : Proposed Rain Garden 2 (East)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| | A | rea (sf) | CN I | Description | | |
|---|-------|----------|---------|-------------|-------------|--|
| * | | 16,559 | 79 (| Open Spac | e (fair) C | |
| * | | 998 | 74 (| Open Spac | e (good) C | |
| * | | 14,476 | 98 I | mpervious | | |
| | | 32,033 | 87 V | Neighted A | verage | |
| | | 17,557 | 79 క | 54.81% Pei | vious Area | |
| | | 14,476 | 98 4 | 45.19% Imp | pervious Ar | ea |
| | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | |
| | 12.8 | 100 | 0.0098 | 0.13 | | Sheet Flow, Sheet flow - grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 0.5 | 86 | 0.0244 | 3.17 | | Shallow Concentrated Flow, SCF - paved |
| | | | | | | Paved Kv= 20.3 fps |
| | 0.7 | 90 | 0.0178 | 2.15 | | Shallow Concentrated Flow, SCF - unpaved |
| | | | | | | Unpaved Kv= 16.1 fps |

14.0 276 Total

Subcatchment 6S: DA 6: CN w/ IC areas



Summary for Subcatchment 7S: DA 7 (Offsite South): CN w/ IC areas

Runoff = 5.03 cfs @ 12.23 hrs, Volume= 19,757 cf, Depth= 2.22" Routed to Link 1L : Offsite Flows

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| | A | rea (sf) | CN [| Description | | |
|----|---------------------------------|------------------|------------------|----------------------|-------------------|--|
| * | | 70,444 | 79 (| Open Spac | e (fair) C | |
| * | | 16,401 | 74 (| Open Spac | e (good) C | |
| * | | 20,156 | 98 I | mpervious | | |
| | 107,001 82 Weighted Average | | | Neighted A | verage | |
| | 86,845 78 | | | 31.16% Per | vious Area | |
| | 20,156 98 18.84% Impervious Are | | | | pervious Ar | ea |
| (r | Tc nin) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
| | 12.1 | 100 | 0.0112 | 0.14 | | Sheet Flow, Sheet flow |
| | 2.2 | 165 | 0.0305 | 1.22 | | Grass: Short n= 0.150 P2= 3.34" Shallow Concentrated Flow, SCF _ grass Short Grass Pasture Kv= 7.0 fps |
| | 0.2 | 44 | 0.0317 | 3.61 | | Shallow Concentrated Flow, SCF _ paved |
| | | | | | | Paved Kv= 20.3 fps |

14.5 309 Total

Subcatchment 7S: DA 7 (Offsite South): CN w/ IC areas



Summary for Subcatchment 8S: DA 8 (Offsite North): CN w/ IC areas

Runoff = 10.54 cfs @ 12.30 hrs, Volume= 45,879 cf, Depth= 1.62" Routed to Link 1L : Offsite Flows

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| | A | rea (sf) | CN | Description | | |
|----|------|----------|--------|--------------|-------------|---|
| * | | 2,767 | 70 | Brush (fair) | С | |
| * | | 63,031 | 77 | Brush (fair) | D | |
| * | | 86,643 | 65 | Brush (goo | d) C | |
| * | (| 64,708 | 73 | Brush (goo | d) D | |
| * | | 73,083 | 79 | Open space | e (Fair) C | |
| * | | 30,261 | 84 | Open space | e (fair) D | |
| * | | 4,460 | 74 | Open space | e (good) C | |
| * | | 9,087 | 80 | Open space | e (good) D | |
| * | | 6,602 | 98 | Impervious | | |
| | 3 | 40,642 | 75 | Weighted A | verage | |
| | 3 | 34,040 | 74 | 98.06% Pe | rvious Area | |
| | | 6,602 | 98 | 1.94% Impe | ervious Are | a |
| | | | | | | |
| | Тс | Length | Slop | e Velocity | Capacity | Description |
| (m | nin) | (feet) | (ft/ft | t) (ft/sec) | (cfs) | |
| | 7.5 | 100 | 0.036 | 6 0.22 | | Sheet Flow, sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| 1 | 1.9 | 876 | 0.006 | 7 1.23 | | Shallow Concentrated Flow, scf - grass waterway |
| | | | | | | Grassed Waterway Kv= 15.0 fps |
| 1 | 9.4 | 976 | Total | | | |



Subcatchment 8S: DA 8 (Offsite North): CN w/ IC areas

Summary for Subcatchment 9S: DA 9 (Offsite Field West): CN w/ IC areas

Runoff = 11.17 cfs @ 12.45 hrs, Volume= 60,998 cf, Depth= 1.53" Routed to Link 1L : Offsite Flows

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| | A | rea (sf) | CN | Description | | |
|---|-------|----------|---------|-------------|--------------|---|
| * | | 72,478 | 65 | Brush (goo | d) C | |
| * | | 10,448 | 79 | Open spcae | e (fair) C | |
| * | 3 | 92,515 | 74 | Open Spac | e (good) C | |
| * | | 4,279 | 98 | Impervious | , | |
| | 4 | 79,720 | 73 | Weighted A | verage | |
| | 4 | 75,441 | 73 | 99.11% Pei | vious Area | |
| | | 4,279 | 98 | 0.89% Impe | ervious Area | a |
| | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | |
| | 10.5 | 100 | 0.0159 | 0.16 | | Sheet Flow, Sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 7.1 | 362 | 0.0148 | 0.85 | | Shallow Concentrated Flow, SCF - grass |
| | | | | | | Short Grass Pasture Kv= 7.0 fps |
| | 12.8 | 1,006 | 0.0076 | 1.31 | | Shallow Concentrated Flow, SCF - grass waterway |
| | | | | | | Grassed Waterway Kv= 15.0 fps |
| | | | | | | |

30.4 1,468 Total

Subcatchment 9S: DA 9 (Offsite Field West): CN w/ IC areas



Summary for Subcatchment 31S: RG 2 DA

Runoff = 1.72 cfs @ 12.22 hrs, Volume= 6,733 cf, Depth= 2.52"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

| | A | rea (sf) | CN | Description | | | |
|---|-----------|----------|--------|--------------------------|------------|---|--|
| * | | 21,638 | 79 | Open Spac | e (fair) C | | |
| * | | 10,397 | 98 | Impervious | 、 | | |
| | 32,035 85 | | 85 | Weighted A | verage | | |
| | | 21,638 | 79 | 67.54% Pervious Area | | | |
| | 10,397 9 | | 98 | 3 32.46% Impervious Area | | | |
| | Tc | Length | Slope | e Velocity | Capacity | Description | |
| | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | |
| | 12.8 | 100 | 0.0098 | 3 0.13 | | Sheet Flow, Sheet flow - grass Grass: Short n= 0.150 P2= 3.34" | |
| | 0.5 | 86 | 0.0244 | 4 3.17 | | Shallow Concentrated Flow, SCF - paved Paved Ky= 20.3 fps | |
| | 0.7 | 90 | 0.0178 | 3 2.15 | | Shallow Concentrated Flow, SCF - unpaved Unpaved Kv= 16.1 fps | |
| | 14.0 | 276 | Total | | | | |

Subcatchment 31S: RG 2 DA



Summary for Reach 1R: Existing Bioswale West 1

Inflow Area = 22,637 sf, 64.43% Impervious, Inflow Depth = 3.04" for 2-Year 2100 event Inflow 1.39 cfs @ 12.22 hrs, Volume= 5.740 cf = 1.38 cfs @ 12.23 hrs, Volume= Outflow = 5,740 cf, Atten= 1%, Lag= 0.5 min Routed to Pond 1P : Exising Rain Garden 1 West Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Max. Velocity= 1.94 fps, Min. Travel Time= 0.3 min Avg. Velocity = 0.52 fps, Avg. Travel Time= 1.0 min Peak Storage= 24 cf @ 12.22 hrs Average Depth at Peak Storage= 0.20', Surface Width= 4.19' Bank-Full Depth= 0.50' Flow Area= 2.3 sf, Capacity= 7.36 cfs 3.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds Side Slope Z-value= 3.0 '/' Top Width= 6.00' Length= 33.0' Slope= 0.0227 '/' Inlet Invert= 100.75', Outlet Invert= 100.00' ‡ Reach 1R: Existing Bioswale West 1 Hydrograph Inflow 1.39 cfs Outflow 1.38 cfs Inflow Area=22,637 sf Avg. Flow Depth=0.20' Max Vel=1.94 fps n=0.035 (cfs) L=33.0' Flow S=0.0227 '/' Capacity=7.36 cfs

0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 Time (hours)

Summary for Reach 2R: Bioswale E 1 RG 3



Summary for Pond 1P: Exising Rain Garden 1 West

[93] Warning: Storage range exceeded by 0.13'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

[62] Hint: Exceeded Reach 1R OUTLET depth by 0.18' @ 12.25 hrs

Inflow Area = 22,637 sf, 64.43% Impervious, Inflow Depth = 3.04" for 2-Year 2100 event Inflow = 1.38 cfs @ 12.23 hrs, Volume= 5,740 cf 1.40 cfs @ 12.24 hrs, Volume= 0.27 cfs @ 12.24 hrs, Volume= = Outflow 5,565 cf, Atten= 0%, Lag= 0.5 min Primarv = 4.082 cf Routed to Pond 2P : Underground Storage w/ Porous Pavement 1 Secondary = 1.13 cfs @ 12.24 hrs, Volume= 1,483 cf Routed to Pond 2P : Underground Storage w/ Porous Pavement 1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.38' @ 12.24 hrs Surf.Area= 1,750 sf Storage= 1,831 cf

Plug-Flow detention time= 512.5 min calculated for 5,561 cf (97% of inflow) Center-of-Mass det. time= 495.2 min (1,276.0 - 780.8)

| Volume | Invert | Avail.Stora | | age | Storage Descrip | otion | | | |
|------------------|--------------|-------------------------|-------------------|---|---|--|--|--|--|
| #1 | 98.25' | 98.25' 1,83 | | 81 cf | Custom Stage | Data (Conic)Listed | below (Recalc) | | |
| Elevatio (fee | on Su et) | rf.Area (sq-ft) | a Voids t) (%) | | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) | | |
| 98.2 | 25 25 | 1,445 | 0. | .0 0 | 0 | 0 | 1,445 | | |
| 99.5 | 50 | 1,445 | 25. | .0 | 90 | 596 | 1,613 | | |
| 100.0 100.2 | 00 25 | 1,750 1,750 | 100. 100. | .0 .0 | 798 438 | 1,394 1,831 | 1,927 1,964 | | |
| Device | Routing | In | vert | Outle | et Devices | | | | |
| #1 | #1 Primary | | .15' | 4.0" Inlet n= 0. | I" Round Culvert L= 11.0' Ke= 0.500 et / Outlet Invert= 98.15' / 98.09' S= 0.0055 '/' Cc= 0.900 0.020 Corrugated PE, corrugated interior, Flow Area= 0.09 sf | | | | |
| #2 | Device 1 | 98 | .15' | 0.5" Limit | Vert. Restrictive | e Orifice C= 0.600 t low heads | , | | |
| #3 Device 2 | | 98 | .25' | 4.0" Inlet n= 0. | " Round 4" HDPE Underdrain L= 20.0' Ke= 0.500 et / Outlet Invert= 98.25' / 98.15' S= 0.0050 '/' Cc= 0.900 0.020 Corrugated PE, corrugated interior, Flow Area= 0.09 sf | | | | |
| #4 Device 3 | | 98.25' 0. ' X | | 0.9" X 3 r | 0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads | | | | |
| #5 Device 1 | | 100.00' | | 4.0" Horiz. Draintech Atrium C= 0.600 Limited to weir flow at low heads | | | | | |
| #6 | Secondary | 100 | .10' | 3.0' I Heac 2.50 Coef 2.85 | ong x 2.0' brea I (feet) 0.20 0.4 3.00 3.50 . (English) 2.54 3.07 3.20 3.32 | dth Broad-Crester 0 0.60 0.80 1.00 2.61 2.61 2.60 2. | Rectangular Weir 1.20 1.40 1.60 1.80 2.00 66 2.70 2.77 2.89 2.88 | | |

Primary OutFlow Max=0.27 cfs @ 12.24 hrs HW=100.37' (Free Discharge) 1=Culvert (Passes 0.27 cfs of 0.44 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.15 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.34 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.26 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.26 cfs @ 2.95 fps)

Secondary OutFlow Max=1.11 cfs @ 12.24 hrs HW=100.37' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 1.11 cfs @ 1.34 fps)



Pond 1P: Exising Rain Garden 1 West

Summary for Pond 2P: Underground Storage w/ Porous Pavement 1

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 61,742 sf, 66.85% Impervious, | Inflow Depth > 3.03" for 2-Year _2100 event |
|---------------|-------------------------------|---|
| Inflow = | 3.79 cfs @ 12.23 hrs, Volume= | 15,573 cf |
| Outflow = | 0.02 cfs @ 24.53 hrs, Volume= | 3,613 cf, Atten= 100%, Lag= 737.9 min |
| Primary = | 0.02 cfs @ 24.53 hrs, Volume= | 3,613 cf |
| Secondary = | 0.00 cfs @ 0.00 hrs, Volume= | 0 cf |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 97.33' @ 24.53 hrs Surf.Area= 13,421 sf Storage= 13,272 cf

Plug-Flow detention time= 1,692.7 min calculated for 3,611 cf (23% of inflow) Center-of-Mass det. time= 1,341.4 min (2,296.9 - 955.5)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 1,612 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 9,359 cf | 72.75'W x 146.02'L x 3.50'H Field A |
| | | | 37,179 cf Overall - 13,782 cf Embedded = 23,397 cf x 40.0% Voids |
| #3A | 96.17' | 13,782 cf | ADS_StormTech SC-740 +Cap x 300 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 300 Chambers in 15 Rows |
| | | 24 752 of | Total Available Storage |

24,753 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevation (feet) | | Surf.Area Voic (sq-ft) (% | | s Inc.Store) (cubic-feet) | Cum.Store (cubic-feet) | | | | |
|---------------------|------------|------------------------------|------|--|---------------------------|------------------------------|--|--|--|
| 96.1 | 17 | 2,798 | 0. | 0 0 | 0 | | | | |
| 97.6 | 67 | 2,798 | 35. | 0 1,469 | 1,469 | | | | |
| 97.8 | 33 | 2,798 | 15. | 0 67 | 1,536 | | | | |
| 98.0 | 01 | 2,798 | 15. | 0 76 | 1,612 | | | | |
| Device Routing | | In | vert | Outlet Devices | | | | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restriction Orifice C= 0.600 | | | | | |
| | | | | Limited to weir flow a | at low heads | | | | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 | | | | | |
| | | | | Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 '/' Cc= 0.900 | | | | | |
| | | | | n= 0.020 Corrugated | d PE, corrugated | interior, Flow Area= 0.20 sf | | | |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. Pe | erforations X 400 | .00 columns | | | |
| | . . | | | X 3 rows C= 0.600 Limited to weir flow at low heads | | | | | |
| #4 Secondary | | ry 98 | .00' | 3.0' long x 2.0' breadth Broad-Crested Rectangular Weir | | | | | |
| | | | | Head (feet) 0.20 0.4 | 40 0.60 0.80 1.0 | 0 1.20 1.40 1.60 1.80 2.00 | | | |
| | | | | 2.50 3.00 3.50 | | | | | |
| | | | | Coer. (English) 2.54 | 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 | | | |
| | | | | 2.85 3.07 3.20 3.32 | Z | | | | |
Primary OutFlow Max=0.02 cfs @ 24.53 hrs HW=97.33' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 11.02 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.44 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 8.20 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs) Site1HillsboroughMunicpComplex_20240628NOAA 24-hr C2-Year_2100 Rainfall=3.97"Prepared by Rutgers Cooperative Extension Water Resources ProgramPrinted 6/29/2024HydroCAD® 10.10-7cs/n 03601© 2022 HydroCAD Software Solutions LLCPage 38

Pond 2P: Underground Storage w/ Porous Pavement 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

20 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 144.02' Row Length +12.0" End Stone x 2 = 146.02' Base Length 15 Rows x 51.0" Wide + 6.0" Spacing x 14 + 12.0" Side Stone x 2 = 72.75' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

300 Chambers x 45.9 cf = 13,782.0 cf Chamber Storage

37,179.5 cf Field - 13,782.0 cf Chambers = 23,397.5 cf Stone x 40.0% Voids = 9,359.0 cf Stone Storage

Chamber Storage + Stone Storage = 23,141.0 cf = 0.531 af Overall Storage Efficiency = 62.2% Overall System Size = 146.02' x 72.75' x 3.50'

300 Chambers 1,377.0 cy Field 866.6 cy Stone





Pond 2P: Underground Storage w/ Porous Pavement 1

Site1HillsboroughMunicpComplex_20240628NOAA 24-hr C2-Year _2100 Rainfall=3.97"Prepared by Rutgers Cooperative Extension Water Resources ProgramPrinted 6/29/2024HydroCAD® 10.10-7cs/n 03601© 2022 HydroCAD Software Solutions LLCPage 40

Summary for Pond 3P: Underground Storage w/ Porous Pavement 2

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 58,249 sf, 86.46% Impervious, | Inflow Depth = 3.46" for 2-Year _2100 event |
|---------------|-------------------------------|---|
| Inflow = | 5.01 cfs @ 12.14 hrs, Volume= | 16,804 cf |
| Outflow = | 0.01 cfs @ 24.15 hrs, Volume= | 3,642 cf, Atten= 100%, Lag= 720.7 min |
| Primary = | 0.01 cfs @ 24.15 hrs, Volume= | 3,642 cf |
| Secondary = | 0.00 cfs @ 0.00 hrs, Volume= | 0 cf |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 97.29' @ 24.15 hrs Surf.Area= 23,296 sf Storage= 15,715 cf

Plug-Flow detention time= 1,747.3 min calculated for 3,642 cf (22% of inflow) Center-of-Mass det. time= 1,505.9 min (2,266.2 - 760.3)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 8,187 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 8,029 cf | 82.25'W x 110.42'L x 3.50'H Field A |
| | | | 31,786 cf Overall - 11,715 cf Embedded = 20,071 cf x 40.0% Voids |
| #3A | 96.17' | 11,715 cf | ADS_StormTech SC-740 +Cap x 255 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 255 Chambers in 17 Rows |
| | | 27.031 of | Total Available Storage |

27,931 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void %) | s Inc.Store Cum.Store b) (cubic-feet) (cubic-feet) | |
|------------------|-----------|----------------------|------------|---|--|
| 96.1 | 17 | 14,214 | 0. | 0 0 0 | |
| 97.6 | 67 | 14,214 | 35. | 0 7,462 7,462 | |
| 97.8 | 33 | 14,214 | 15. | 0 341 7,803 | |
| 98.0 |)1 | 14,214 | 15. | 0 384 8,187 | |
| Device | Routing | In | vert | Outlet Devices | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restriction Orifice C= 0.600 | |
| | | | | Limited to weir flow at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 | |
| | | | | Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 '/' Cc= 0.900 | |
| | | | | n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf | |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. Perforations X 400.00 columns | |
| | | | | X 3 rows C= 0.600 Limited to weir flow at low heads | |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' breadth Broad-Crested Rectangular Weir | |
| | | | | Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 | |
| | | | | | |
| | | | | Coet. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 | |
| | | | | 2.85 3.07 3.20 3.32 | |

Primary OutFlow Max=0.01 cfs @ 24.15 hrs HW=97.29' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.01 cfs @ 10.98 fps) 2=6" HDPE Underdrain (Passes 0.01 cfs of 0.43 cfs potential flow) 3=Perforations (Passes 0.01 cfs of 8.17 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs) Site1HillsboroughMunicpComplex_20240628NOAA 24-hr C2-Year_2100 Rainfall=3.97"Prepared by Rutgers Cooperative Extension Water Resources ProgramPrinted 6/29/2024HydroCAD® 10.10-7cs/n 03601© 2022 HydroCAD Software Solutions LLCPage 42

Pond 3P: Underground Storage w/ Porous Pavement 2 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

15 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 108.42' Row Length +12.0" End Stone x 2 = 110.42' Base Length
17 Rows x 51.0" Wide + 6.0" Spacing x 16 + 12.0" Side Stone x 2 = 82.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

255 Chambers x 45.9 cf = 11,714.7 cf Chamber Storage

31,786.2 cf Field - 11,714.7 cf Chambers = 20,071.5 cf Stone x 40.0% Voids = 8,028.6 cf Stone Storage

Chamber Storage + Stone Storage = 19,743.3 cf = 0.453 af Overall Storage Efficiency = 62.1% Overall System Size = 110.42' x 82.25' x 3.50'

255 Chambers 1,177.3 cy Field 743.4 cy Stone





Pond 3P: Underground Storage w/ Porous Pavement 2

Site1HillsboroughMunicpComplex_20240628NOAA 24-hr C2-Year_2100 Rainfall=3.97"Prepared by Rutgers Cooperative Extension Water Resources ProgramPrinted 6/29/2024HydroCAD® 10.10-7cs/n 03601© 2022 HydroCAD Software Solutions LLCPage 44

Summary for Pond 4P: Existing Rain Garden 2 Front

25,889 sf, 48.62% Impervious, Inflow Depth = 2.81" for 2-Year 2100 event Inflow Area = Inflow = 1.81 cfs @ 12.15 hrs, Volume= 6.067 cf 0.47 cfs @ 12.47 hrs, Volume= Outflow = 4,938 cf, Atten= 74%, Lag= 19.2 min 0.20 cfs @ 12.47 hrs, Volume= Primary = 4,306 cf Routed to Pond 6P : Underground Storage w/ Porous Pavement 3 Secondary = 0.27 cfs @ 12.47 hrs, Volume= 633 cf Routed to Pond 6P : Underground Storage w/ Porous Pavement 3

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 101.21' @ 12.47 hrs Surf.Area= 3,045 sf Storage= 3,140 cf

Plug-Flow detention time= 762.4 min calculated for 4,938 cf (81% of inflow) Center-of-Mass det. time= 683.3 min (1,468.8 - 785.5)

| <u>Volume</u> | Invert | Avail.Storage | | Storage Descript | tion | |
|---------------|-----------|---------------|--|--|--|--|
| #1 | 99.25' | 3 | 8,267 cf | Custom Stage I | Data (Conic)Listed | below (Recalc) |
| Elevatio | on Su | rf.Area ∖ | /oids | Inc.Store | Cum.Store | Wet.Area |
| (tee | et) | (sq-ft) | (%) | (cubic-feet) | (cubic-feet) | <u>(sq-ft)</u> |
| 99.2 | 25 | 2,635 | 0.0 | 0 | 0 | 2,635 |
| 100.2 | 25 | 2,635 | 35.0 | 922 | 922 | 2,817 |
| 100. | 50 | 2,635 | 25.0 | 165 | 1,087 | 2,862 |
| 101.0 | 00 | 3,045 1 | 0.00 | 1,419 | 2,506 | 3,283 |
| 101.2 | 25 | 3,045 1 | 00.0 | 761 | 3,267 | 3,332 |
| Device | Routing | Inve | ert Outle | et Devices | | |
| #1 | Primary | 99.1 | 5' 4.0'' Inlet n= 0 | Round Culvert / Outlet Invert= 99 .020 Corrugated | L= 11.0' Ke= 0.50 9.15' / 99.09' S= 0 PE, corrugated inte | 00 .0055 '/' Cc= 0.900 erior, Flow Area= 0.09 sf |
| #2 | Device 1 | 99.1 | 5' 0.5'' Limi | Vert. Restrictive ted to weir flow at | Orifice C= 0.600 low heads | |
| #3 | Device 2 | 99.2 | 5' 4.0'' Inlet n= 0 | Round 4" HDPE / Outlet Invert= 99 .020 Corrugated | Underdrain L= 20 9.25' / 99.15' S= 0 PE. corrugated inte | 0.0' Ke= 0.500 0.0050 '/' Cc= 0.900 erior. Flow Area= 0.09 sf |
| #4 | Device 3 | 99.2 | 5' 0.9'' X 3 | x 0.1" Horiz. Per rows C= 0.600 L | forations X 400.00 |) columns at low heads |
| #5 | Device 1 | 101.0 | 0' 4.0'' Limi | Horiz. Draintech | Atrium C= 0.600 | |
| #6 | Secondary | 101.1 | 0' 3.0' Hea 2.50 Coe 2.85 | long x 2.0' bread d (feet) 0.20 0.40 3.00 3.50 f. (English) 2.54 3.07 3.20 3.32 | Broad-Crested 0.60 0.80 1.00 2.61 2.61 2.60 2. | Rectangular Weir 1.20 1.40 1.60 1.80 2.00 66 2.70 2.77 2.89 2.88 |

Primary OutFlow Max=0.20 cfs @ 12.47 hrs HW=101.21' (Free Discharge) 1=Culvert (Passes 0.20 cfs of 0.42 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 6.87 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.33 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.05 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.19 cfs @ 2.20 fps)

Secondary OutFlow Max=0.27 cfs @ 12.47 hrs HW=101.21' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 0.27 cfs @ 0.83 fps)



Pond 4P: Existing Rain Garden 2 Front

Summary for Pond 5P: Proposed Rain Garden 1 (South West)

[93] Warning: Storage range exceeded by 0.06'

Inflow Area = 21,388 sf, 65.14% Impervious, Inflow Depth = 2.98" for 2-Year 2100 event 1.55 cfs @ 12.15 hrs, Volume= Inflow = 5,315 cf 1.00 cfs @ 12.30 hrs, Volume= Outflow = 4,764 cf, Atten= 35%, Lag= 8.8 min 0.24 cfs @ 12.30 hrs, Volume= Primary = 3,954 cf Routed to Pond 6P : Underground Storage w/ Porous Pavement 3 0.75 cfs @ 12.30 hrs, Volume= Secondary = 810 cf Routed to Pond 6P : Underground Storage w/ Porous Pavement 3

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 101.31' @ 12.30 hrs Surf.Area= 2,325 sf Storage= 2,466 cf

Plug-Flow detention time= 712.4 min calculated for 4,764 cf (90% of inflow) Center-of-Mass det. time= 658.5 min (1,432.0 - 773.6)

| Volume | Invert | Avail.Storage | | age | Storage Descript | tion | | |
|-------------------|-----------|---------------|------|--|---------------------|-----------------------|-----------------------------|--|
| #1 | 99.25' | | 2,46 | 6 cf | Custom Stage I | Data (Conic)Listed | below (Recalc) | |
| Elevati | on Su | rf.Area | Voic | ls | Inc.Store | Cum.Store | Wet.Area | |
| (fee | et) | (sq-ft) | (% | 6) | (cubic-feet) | (cubic-feet) | <u>(sq-ft)</u> | |
| 99. | 25 | 1,970 | 0. | .0 | 0 | 0 | 1,970 | |
| 100. | 25 | 1,970 | 35. | .0 | 690 | 690 | 2,127 | |
| 100. | 50 | 1,970 | 25 | .0 | 123 | 813 | 2,167 | |
| 101. | 00 | 2,325 | 100 | .0 | 1,073 | 1,885 | 2,531 | |
| 101. | 25 | 2,325 | 100 | .0 | 581 | 2,466 | 2,574 | |
| Device | Routing | In | vert | Outl | et Devices | | | |
| #1 | Primary | 99 | .15' | 4.0" | Round Culvert | L= 11.0' Ke= 0.50 | | |
| | | | | n = 0 | 0.020 Corrugated | PE corrugated inte | -00007 - 0000 - 0000 | |
| #2 | Device 1 | 00 | 15' | 0.5" | Vort Postrictivo | | enor, Flow Area - 0.09 Si | |
| π2 | Device | 33 | . 15 | L imi | ted to weir flow at | low heads | | |
| #3 | Device 2 | qq | 25' | 4 0" | Round 4" HDPF | Inderdrain = 2 | 0.0' Ke= 0.500 | |
| <i>#</i> 0 | Device 2 | 00 | .20 | Inlet / Outlet Invert= 99.25' / 99.15' $S = 0.0050 $ '/' $C = 0.000$ | | | | |
| | | | | n=0 | 020 Corrugated | PE corrugated inte | Prior Flow Area = 0.09 sf | |
| #4 | Device 3 | 99 | 25' | 0.9" | x 0.1" Horiz Per | forations X 400 00 | columns | |
| | Device e | 00 | .20 | X 3 | rows $C = 0.600$ L | imited to weir flow a | at low heads | |
| #5 | Device 1 | 101 | .00' | 4.0" | Horiz, Draintech | Atrium $C = 0.600$ | | |
| | | | | Limi | ted to weir flow at | low heads | | |
| #6 | Secondary | 101 | .10' | 3.0' | long x 2.0' bread | th Broad-Crested | Rectangular Weir | |
| | , | | | Hea | d (feet) 0.20 0.40 | 0.60 0.80 1.00 | 1.20 1.40 1.60 1.80 2.00 | |
| | | | | 2.50 | 3.00 3.50 | | | |
| | | | | Coe | f. (English) 2.54 | 2.61 2.61 2.60 2. | 66 2.70 2.77 2.89 2.88 | |
| | | | | 2.85 | 3.07 3.20 3.32 | | | |

Primary OutFlow Max=0.24 cfs @ 12.30 hrs HW=101.31' (Free Discharge) 1=Culvert (Passes 0.24 cfs of 0.43 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.04 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.34 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.18 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.23 cfs @ 2.69 fps)

Secondary OutFlow Max=0.74 cfs @ 12.30 hrs HW=101.31' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 0.74 cfs @ 1.17 fps)



Pond 5P: Proposed Rain Garden 1 (South West)

Site1HillsboroughMunicpComplex_20240628NOAA 24-hr C2-Year _2100 Rainfall=3.97"Prepared by Rutgers Cooperative Extension Water Resources ProgramPrinted 6/29/2024HydroCAD® 10.10-7cs/n 03601© 2022 HydroCAD Software Solutions LLCPage 48

Summary for Pond 6P: Underground Storage w/ Porous Pavement 3

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 158,623 sf, 63.48% Impervious, | Inflow Depth > 2.87" for 2-Year _2100 event |
|---------------|---|---|
| Inflow = | 8.38 cfs @ 12.16 hrs, Volume= | 37,884 cf |
| Outflow = | 0.01 cfs @ 65.01 hrs, Volume= | 3,591 cf, Atten= 100%, Lag= 3,171.0 min |
| Primary = | 0.01 cfs @ 65.01 hrs, Volume= | 3,591 cf |
| Secondary = | 0.00 cfs $\overline{@}$ 0.00 hrs, Volume= | 0 cf |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 97.18' @ 65.01 hrs Surf.Area= 38,014 sf Storage= 34,307 cf

Plug-Flow detention time= 1,851.9 min calculated for 3,589 cf (9% of inflow) Center-of-Mass det. time= 1,347.2 min (2,293.5 - 946.4)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|---|
| #1 | 96.17' | 4,287 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 26,630 cf | 106.00'W x 288.42'L x 3.50'H Field A |
| | | | 107,003 cf Overall - 40,427 cf Embedded = 66,575 cf x 40.0% Voids |
| #3A | 96.17' | 40,427 cf | ADS_StormTech SC-740 +Cap x 880 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 880 Chambers in 22 Rows |
| | | 71 244 of | Total Available Storage |

71,344 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void (% | ls Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | |
|------------------|-----------|----------------------|------------|------------------------------|---------------------------|------------------------------|
| 96.1 | 17 | 7,442 | 0. | .0 0 | 0 | |
| 97.6 | 67 | 7,442 | 35. | .0 3,907 | 3,907 | |
| 97.8 | 33 | 7,442 | 15. | .0 179 | 4,086 | |
| 98.0 |)1 | 7,442 | 15. | .0 201 | 4,287 | |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | on Orifice C= 0. | 600 |
| | | | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | PE Underdrain L | = 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | = 92.17' / 90.37' S | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. F | Perforations X 40 | 0.00 columns |
| | | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bre | eadth Broad-Cres | ted Rectangular Weir |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | | |
| | | | | Coef. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3.3 | 32 | |

Primary OutFlow Max=0.01 cfs @ 65.01 hrs HW=97.18' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.01 cfs @ 10.86 fps) 2=6" HDPE Underdrain (Passes 0.01 cfs of 0.43 cfs potential flow) 3=Perforations (Passes 0.01 cfs of 8.08 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs) Site1HillsboroughMunicpComplex_20240628NOAA 24-hr C2-Year _2100 Rainfall=3.97"Prepared by Rutgers Cooperative Extension Water Resources ProgramPrinted 6/29/2024HydroCAD® 10.10-7cs/n 03601© 2022 HydroCAD Software Solutions LLCPage 50

Pond 6P: Underground Storage w/ Porous Pavement 3 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

40 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 286.42' Row Length +12.0" End Stone x 2 = 288.42' Base Length 22 Rows x 51.0" Wide + 6.0" Spacing x 21 + 12.0" Side Stone x 2 = 106.00' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

880 Chambers x 45.9 cf = 40,427.2 cf Chamber Storage

107,002.6 cf Field - 40,427.2 cf Chambers = 66,575.4 cf Stone x 40.0% Voids = 26,630.1 cf Stone Storage

Chamber Storage + Stone Storage = 67,057.4 cf = 1.539 af Overall Storage Efficiency = 62.7% Overall System Size = 288.42' x 106.00' x 3.50'

880 Chambers 3,963.1 cy Field 2,465.8 cy Stone





Pond 6P: Underground Storage w/ Porous Pavement 3

Summary for Pond 7P: Proposed Rain Garden 4 (North)

[93] Warning: Storage range exceeded by 0.28'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

| Inflow Area | a = | 24,369 sf | 57.53% In | npervious, | Inflow Depth = | 2.97" | for 2-Yea | r _2100 event |
|-------------|---------|-------------|-------------|-------------|----------------|----------|------------|---------------|
| Inflow | = | 1.77 cfs @ | 12.15 hrs, | Volume= | 6,036 c | f | | _ |
| Outflow | = | 2.47 cfs @ | 12.21 hrs, | Volume= | 5,806 c | f, Atter | n= 0%, Lag | = 3.5 min |
| Primary | = | 0.32 cfs @ | 12.21 hrs, | Volume= | 4,289 c | f | - | |
| Routed | to Pond | 8P : Underg | round Stora | ge w/ Poro | ous Pavement 4 | | | |
| Secondary | / = | 2.15 cfs @ | 12.21 hrs, | Volume= | 1,518 c | f | | |
| Routed | to Pond | 8P : Underg | round Stora | ige w/ Poro | ous Pavement 4 | | | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2 Peak Elev= 100.53' @ 12.21 hrs Surf.Area= 2,435 sf Storage= 2,453 cf

Plug-Flow detention time= 563.4 min calculated for 5,802 cf (96% of inflow) Center-of-Mass det. time= 541.9 min (1,320.9 - 779.0)

| Volume | Invert | Avail.Storage | | Storage Descript | ion | | |
|----------------|---------------------------------|-------------------------|---|--|--|--|-----------|
| #1 | 98.25' | 2 | ,453 cf | Custom Stage I | Data (Conic)Listed | below (Recalc) | |
| Elevatio | on Su | rf.Area V | oids | Inc.Store | Cum.Store | Wet.Area | |
| (196 | <i>et)</i> | (sq-it) | (%) | (cubic-leet) | (cubic-leet) | (SQ-IL) | |
| 98.2 | 25 | 1,870 | 0.0 | 0 | 0 | 1,870 | |
| 99.2 | 25 | 1,870 3 | 35.0 | 655 | 655 | 2,023 | |
| 99.5 | 50 | 1,870 2 | 25.0 | 117 | 771 | 2,062 | |
| 100.0 | 00 | 2,435 10 | 0.00 | 1,073 | 1,845 | 2,633 | |
| 100.2 | 25 | 2,435 10 | 0.00 | 609 | 2,453 | 2,676 | |
| Device | Routing | Inver | rt Outle | et Devices | | | |
| #1 #2 #3 | Primary Device 1 Device 2 | 98.15 98.15 98.25 | 5' 4.0" Inlet n= 0 5' 0.5" Limit 5' 4.0" Inlet n= 0 | Round Culvert / Outlet Invert= 98 0.020 Corrugated Vert. Restrictive ted to weir flow at Round 4" HDPE / Outlet Invert= 98 0.020 Corrugated | L= 11.0' Ke= 0.50 3.15' / 98.09' S= 0 PE, corrugated inte Orifice C= 0.600 low heads Underdrain L= 20 3.25' / 98.15' S= 0 PE, corrugated inte | 0 .0055 '/' Cc= 0.900 rior, Flow Area= 0.09 s 0.0' Ke= 0.500 .0050 '/' Cc= 0.900 erior, Flow Area= 0.09 s | sf |
| #4 | Device 3 | 98.25 | 5' 0.9" X31 | x 0.1" Horiz. Per rows C= 0.600 Li | forations X 400.00 mited to weir flow a | t columns at low heads | |
| #5 | Device 1 | 100.00 |)' 4.0'' Limit | Horiz. Draintech | Atrium C= 0.600 | | |
| #6 | Secondary | 100.10 |)' 3.0' Head 2.50 Coet 2.85 | long x 2.0' bread d (feet) 0.20 0.40 3.00 3.50 f. (English) 2.54 2 3.07 3.20 3.32 | Ith Broad-Crested 0 0.60 0.80 1.00 2.61 2.61 2.60 2. | Rectangular Weir 1.20 1.40 1.60 1.80 2 66 2.70 2.77 2.89 2.8 | 2.00 8 |

Primary OutFlow Max=0.30 cfs @ 12.21 hrs HW=100.49' (Free Discharge) 1=Culvert (Passes 0.30 cfs of 0.45 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.33 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.35 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.40 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.29 cfs @ 3.36 fps)

Secondary OutFlow Max=1.92 cfs @ 12.21 hrs HW=100.49' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 1.92 cfs @ 1.63 fps)



Pond 7P: Proposed Rain Garden 4 (North)

Site1HillsboroughMunicpComplex_20240628NOAA 24-hr C2-Year _2100 Rainfall=3.97"Prepared by Rutgers Cooperative Extension Water Resources ProgramPrinted 6/29/2024HydroCAD® 10.10-7cs/n 03601© 2022 HydroCAD Software Solutions LLCPage 54

Summary for Pond 8P: Underground Storage w/ Porous Pavement 4

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 97,166 sf, 80.96% Impervious, | Inflow Depth > 3.34" for 2-Year _2100 event |
|---------------|-------------------------------|---|
| Inflow = | 7.67 cfs @ 12.19 hrs, Volume= | 27,046 cf |
| Outflow = | 0.01 cfs @ 24.56 hrs, Volume= | 3,618 cf, Atten= 100%, Lag= 741.8 min |
| Primary = | 0.01 cfs @ 24.56 hrs, Volume= | 3,618 cf |
| Secondary = | 0.00 cfs @ 0.00 hrs, Volume= | 0 cf |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 97.21' @ 24.56 hrs Surf.Area= 33,612 sf Storage= 24,597 cf

Plug-Flow detention time= 1,810.4 min calculated for 3,618 cf (13% of inflow) Center-of-Mass det. time= 1,399.4 min (2,280.1 - 880.7)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 9,112 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 15,592 cf | 63.25'W x 281.30'L x 3.50'H Field A |
| | | | 62,272 cf Overall - 23,292 cf Embedded = 38,980 cf x 40.0% Voids |
| #3A | 96.17' | 23,292 cf | ADS_StormTech SC-740 +Cap x 507 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 507 Chambers in 13 Rows |
| | | 47 006 of | Total Available Storage |

47,996 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void %) | s Inc.Store) (cubic-feet) | Cum.Store (cubic-feet) | |
|------------------|-----------|----------------------|------------|-------------------------------|---------------------------|---|
| 96.1 | 17 | 15,820 | 0. |) 0 | 0 | |
| 97.6 | 67 | 15,820 | 35. |) 8,306 | 8,306 | |
| 97.8 | 33 | 15,820 | 15. |) 380 | 8,685 | |
| 98.0 | 01 | 15,820 | 15. |) 427 | 9,112 | |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restriction | Orifice C= 0.600 | 1 |
| | - | | | Limited to weir flow at lo | ow heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HDPE | Underdrain L= 3 | 59.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= 92. | 17' / 90.37' S= 0 | 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugated P | E, corrugated inte | erior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. Perfe | orations X 400.00 |) columns |
| | - · | | | X 3 rows C= 0.600 Lin | nited to weir flow a | at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' breadt | h Broad-Crested | Rectangular Weir |
| | | | | Head (feet) 0.20 0.40 | 0.60 0.80 1.00 | 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | | ~ |
| | | | | Coet. (English) 2.54 2 | .61 2.61 2.60 2. | 66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3.32 | | |

Primary OutFlow Max=0.01 cfs @ 24.56 hrs HW=97.21' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.01 cfs @ 10.90 fps) 2=6" HDPE Underdrain (Passes 0.01 cfs of 0.43 cfs potential flow) 3=Perforations (Passes 0.01 cfs of 8.11 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs) Site1HillsboroughMunicpComplex_20240628NOAA 24-hr C2-Year_2100 Rainfall=3.97"Prepared by Rutgers Cooperative Extension Water Resources ProgramPrinted 6/29/2024HydroCAD® 10.10-7cs/n 03601© 2022 HydroCAD Software Solutions LLCPage 56

Pond 8P: Underground Storage w/ Porous Pavement 4 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

39 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 279.30' Row Length +12.0" End Stone x 2 = 281.30' Base Length
13 Rows x 51.0" Wide + 6.0" Spacing x 12 + 12.0" Side Stone x 2 = 63.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

507 Chambers x 45.9 cf = 23,291.6 cf Chamber Storage

62,272.0 cf Field - 23,291.6 cf Chambers = 38,980.5 cf Stone x 40.0% Voids = 15,592.2 cf Stone Storage

Chamber Storage + Stone Storage = 38,883.8 cf = 0.893 af Overall Storage Efficiency = 62.4% Overall System Size = 281.30' x 63.25' x 3.50'

507 Chambers 2,306.4 cy Field 1,443.7 cy Stone





Summary for Pond 9P: Proposed Rain Garden 3 (North East)

[93] Warning: Storage range exceeded by 0.09' [62] Hint: Exceeded Reach 2R OUTLET depth by 0.06' @ 12.45 hrs

| Inflow Area | a = | 19,898 sf, | 48.83% In | npervious, | Inflow Depth = | 2.82" | for 2-Year | _2100 event |
|-------------|---|-------------|-------------|------------|----------------|----------|-------------|-------------|
| Inflow | = | 1.24 cfs @ | 12.20 hrs, | Volume= | 4,670 c | f | | _ |
| Outflow | = | 1.12 cfs @ | 12.26 hrs, | Volume= | 4,535 c | f, Atten | i= 10%, Lag | = 4.0 min |
| Primary | = | 0.25 cfs @ | 12.27 hrs, | Volume= | 3,651 c | f | | |
| Routed | Routed to Pond 10P : Underground Storage w/ Porous Pavement 5 | | | | | | | |
| Secondary | / = | 0.86 cfs @ | 12.26 hrs, | Volume= | 884 c | f | | |
| Routed | to Pond | 10P : Under | ground Stor | age w/ Por | ous Pavement 5 | | | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.34' @ 12.27 hrs Surf.Area= 1,670 sf Storage= 1,751 cf

Plug-Flow detention time= 594.3 min calculated for 4,535 cf (97% of inflow) Center-of-Mass det. time= 576.4 min (1,365.4 - 789.0)

| Volume | Invert | Avail. | .Storage | Storage Descrip | tion | | |
|----------|-----------|---------|--|--|--|--|------------|
| #1 | 98.25' | | 1,751 c | f Custom Stage | Data (Conic)Listed | below (Recalc) | |
| Elevatio | on Su | rf.Area | Voids | Inc.Store | Cum.Store | Wet.Area | |
| (166 | et) | (sq-π) | (%) | (cubic-feet) | (cubic-feet) | (sq-π) | |
| 98.2 | 25 | 1,385 | 0.0 | 0 | 0 | 1,385 | |
| 99.2 | 25 | 1,385 | 35.0 | 485 | 485 | 1,517 | |
| 99.5 | 50 | 1,385 | 25.0 | 87 | 571 | 1,550 | |
| 100.0 | 00 | 1,670 | 100.0 | 763 | 1,334 | 1,843 | |
| 100.2 | 25 | 1,670 | 100.0 | 418 | 1,751 | 1,879 | |
| Device | Routing | Inv | ert Ou | Itlet Devices | | | |
| #1 | Primary | 98. | 15' 4.(Inl n= |)" Round Culvert et / Outlet Invert= 9 0.020 Corrugated | L= 11.0' Ke= 0.50 8.15' / 98.09' S= 0 PE, corrugated inte |)0).0055 '/' Cc= 0.900 erior, Flow Area= 0.09 : | sf |
| #2 | Device 1 | 98. | 15' 0. Lir | 5" Vert. Restrictive nited to weir flow at | Orifice C= 0.600 low heads | | |
| #3 | Device 2 | 98.2 | 25' 4.(Inl n= |)" Round 4" HDPf et / Outlet Invert= 9 0.020 Corrugated | E Underdrain L= 2 8.25' / 98.15' S= 0 PE, corrugated inte | 0.0' Ke= 0.500).0050 '/' Cc= 0.900 erior, Flow Area= 0.09 | sf |
| #4 | Device 3 | 98.2 | 25' 0. 9 |)" x 0.1" Horiz. Pe 3 rows C= 0.600 L | rforations X 400.00 |) columns at low heads | |
| #5 | Device 1 | 100.0 | 00' 4.(Lir |)" Horiz. Draintech | Atrium C= 0.600 |) | |
| #6 | Secondary | 100. | 10' 3.(He 2.(Co 2.8 | b)' long x 2.0' brea ead (feet) 0.20 0.4 50 3.00 3.50 bef. (English) 2.54 35 3.07 3.20 3.32 | dth Broad-Crested 0 0.60 0.80 1.00 2.61 2.61 2.60 2. | Rectangular Weir 1.20 1.40 1.60 1.80 2 66 2.70 2.77 2.89 2.8 | 2.00 38 |

Primary OutFlow Max=0.25 cfs @ 12.27 hrs HW=100.32' (Free Discharge) 1=Culvert (Passes 0.25 cfs of 0.43 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.06 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.34 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.19 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.24 cfs @ 2.72 fps)

Secondary OutFlow Max=0.79 cfs @ 12.26 hrs HW=100.32' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 0.79 cfs @ 1.20 fps)



Pond 9P: Proposed Rain Garden 3 (North East)

Site1HillsboroughMunicpComplex_20240628NOAA 24-hr C2-Year _2100 Rainfall=3.97"Prepared by Rutgers Cooperative Extension Water Resources ProgramPrinted 6/29/2024HydroCAD® 10.10-7cs/n 03601© 2022 HydroCAD Software Solutions LLCPage 60

Summary for Pond 10P: Underground Storage w/ Porous Pavement 5

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 78,061 sf, 72.85% Impervious, | Inflow Depth > 3.19" for 2-Year _2100 event |
|---------------|-------------------------------|---|
| Inflow = | 4.77 cfs @ 12.23 hrs, Volume= | 20,720 cf |
| Outflow = | 0.01 cfs @ 24.41 hrs, Volume= | 3,623 cf, Atten= 100%, Lag= 730.7 min |
| Primary = | 0.01 cfs @ 24.41 hrs, Volume= | 3,623 cf |
| Secondary = | 0.00 cfs @ 0.00 hrs, Volume= | 0 cf |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 97.23' @ 24.41 hrs Surf.Area= 27,852 sf Storage= 18,421 cf

Plug-Flow detention time= 1,753.8 min calculated for 3,623 cf (17% of inflow) Center-of-Mass det. time= 1,380.9 min (2,279.1 - 898.1)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 9,426 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 10,110 cf | 63.25'W x 181.62'L x 3.50'H Field A |
| | | | 40,205 cf Overall - 14,931 cf Embedded = 25,275 cf x 40.0% Voids |
| #3A | 96.17' | 14,931 cf | ADS_StormTech SC-740 +Cap x 325 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 325 Chambers in 13 Rows |
| | | 24 467 of | Total Available Storage |

34,467 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void %) | s Inc.Store b) (cubic-feet) | Cum.Store (cubic-feet) | |
|------------------|-----------|----------------------|------------|--------------------------------|---------------------------|------------------------------|
| 96.1 | 17 | 16,365 | 0. | 0 0 | 0 | |
| 97.6 | 67 | 16,365 | 35. | 0 8,592 | 8,592 | |
| 97.8 | 33 | 16,365 | 15. | 0 393 | 8,984 | |
| 98.0 |)1 | 16,365 | 15. | 0 442 | 9,426 | |
| Device | Routina | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | on Orifice C= 0. | 600 |
| | 5 | | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | PE Underdrain L | = 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | = 92.17' / 90.37' S | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. F | Perforations X 40 | 0.00 columns |
| | | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bre | eadth Broad-Cres | ted Rectangular Weir |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | | |
| | | | | Coef. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3.3 | 32 | |

Primary OutFlow Max=0.01 cfs @ 24.41 hrs HW=97.23' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.01 cfs @ 10.92 fps) 2=6" HDPE Underdrain (Passes 0.01 cfs of 0.43 cfs potential flow) 3=Perforations (Passes 0.01 cfs of 8.13 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs) Site1HillsboroughMunicpComplex_20240628NOAA 24-hr C2-Year_2100 Rainfall=3.97"Prepared by Rutgers Cooperative Extension Water Resources ProgramPrinted 6/29/2024HydroCAD® 10.10-7cs/n 03601© 2022 HydroCAD Software Solutions LLCPage 62

Pond 10P: Underground Storage w/ Porous Pavement 5 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

25 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 179.62' Row Length +12.0" End Stone x 2 = 181.62' Base Length 13 Rows x 51.0" Wide + 6.0" Spacing x 12 + 12.0" Side Stone x 2 = 63.25' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

325 Chambers x 45.9 cf = 14,930.5 cf Chamber Storage

40,205.4 cf Field - 14,930.5 cf Chambers = 25,274.9 cf Stone x 40.0% Voids = 10,110.0 cf Stone Storage

Chamber Storage + Stone Storage = 25,040.5 cf = 0.575 af Overall Storage Efficiency = 62.3% Overall System Size = 181.62' x 63.25' x 3.50'

325 Chambers 1,489.1 cy Field 936.1 cy Stone



Pond 10P: Underground Storage w/ Porous Pavement 5

Summary for Pond 11P: Proposed Rain Garden 2 (East)

[93] Warning: Storage range exceeded by 0.10'

Inflow Area = 32,033 sf, 45.19% Impervious, Inflow Depth = 2.75" for 2-Year 2100 event 1.84 cfs @ 12.22 hrs, Volume= Inflow = 7,343 cf Outflow = 1.24 cfs @ 12.40 hrs, Volume= 7,127 cf, Atten= 33%, Lag= 11.0 min 0.27 cfs @ 12.40 hrs, Volume= Primary = 5,879 cf Routed to Pond 12P : Underground Storage w/ Porous Pavement 6 0.97 cfs @ 12.40 hrs, Volume= Secondary = 1.248 cf Routed to Pond 12P : Underground Storage w/ Porous Pavement 6

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.35' @ 12.40 hrs Surf.Area= 3,045 sf Storage= 3,267 cf

Plug-Flow detention time= 709.1 min calculated for 7,122 cf (97% of inflow) Center-of-Mass det. time= 692.5 min (1,486.0 - 793.5)

| Volume | Invert | Avail. | .Storage | Storage Descrip | tion | | |
|----------------|--------------|--------------------|--|--|---|---|---------|
| #1 | 98.25' | | 3,267 cf | Custom Stage | Data (Conic)Listed | below (Recalc) | |
| Elevati (fe | on Su et) | rf.Area (sq-ft) | Voids (%) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) | |
| 98. | 25 | 2,635 | 0.0 | 0 | 0 | 2,635 | |
| 99. | 25 | 2,635 | 35.0 | 922 | 922 | 2,817 | |
| 99. | 50 | 2,635 | 25.0 | 165 | 1,087 | 2,862 | |
| 100. | 00 | 3,045 | 100.0 | 1,419 | 2,506 | 3,283 | |
| 100. | 25 | 3,045 | 100.0 | 761 | 3,267 | 3,332 | |
| Device | Routing | Inv | ert Out | let Devices | | | |
| #1 | Primary | 98. | 15' 4.0 Inle n= | Round Culvert t / Outlet Invert= 9 0.020 Corrugated | L= 11.0' Ke= 0.50 8.15' / 98.09' S= 0 PE, corrugated inte | 0 .0055 '/' Cc= 0.900 rior, Flow Area= 0.09 sf | ī |
| #2 | Device 1 | 98. | 15' 0.7 Lim | " Vert. Restrictive ited to weir flow at | Orifice C= 0.600 low heads | | |
| #3 | Device 2 | 98.2 | 25' 4.0 Inle n= | Round 4" HDPE t / Outlet Invert= 9 0 020 Corrugated | E Underdrain L= 20 8.25' / 98.15' S= 0 PE corrugated inte |).0' Ke= 0.500 .0050 '/' Cc= 0.900 erior Flow Area= 0.09 sf | f |
| #4 | Device 3 | 98.2 | 25' 0.9 X 3 | " x 0.1" Horiz. Per rows C= 0.600 L | forations X 400.00 | columns at low heads | |
| #5 | Device 1 | 100.0 | 00' 4.0 Lim | " Horiz. Draintech ited to weir flow at | Atrium C= 0.600 low heads | | |
| #6 | Secondary | 100. | 10' 3.0 Hea 2.5 Coe 2.8 | ' long x 2.0' bread ad (feet) 0.20 0.40 0 3.00 3.50 ef. (English) 2.54 5 3.07 3.20 3.32 | Broad-Crested 0 0.60 0.80 1.00 2.61 2.61 2.60 2.6 | Rectangular Weir 1.20 1.40 1.60 1.80 2. 36 2.70 2.77 2.89 2.88 | 00 } |

Primary OutFlow Max=0.27 cfs @ 12.40 hrs HW=100.35' (Free Discharge) 1=Culvert (Passes 0.27 cfs of 0.43 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.02 cfs @ 7.09 fps) 3=4" HDPE Underdrain (Passes 0.02 cfs of 0.34 cfs potential flow) 4=Perforations (Passes 0.02 cfs of 5.23 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.25 cfs @ 2.84 fps)

Secondary OutFlow Max=0.96 cfs @ 12.40 hrs HW=100.35' (Free Discharge) GeBroad-Crested Rectangular Weir (Weir Controls 0.96 cfs @ 1.28 fps)



Pond 11P: Proposed Rain Garden 2 (East)

Summary for Pond 12P: Underground Storage w/ Porous Pavement 6

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 32,033 sf, 45.19% Impervious, | Inflow Depth > 2.67" for 2-Year _2100 event |
|---------------|-------------------------------|---|
| Inflow = | 1.24 cfs @ 12.40 hrs, Volume= | 7,127 cf |
| Outflow = | 0.01 cfs @ 50.90 hrs, Volume= | 3,224 cf, Atten= 99%, Lag= 2,310.1 min |
| Primary = | 0.01 cfs @ 50.90 hrs, Volume= | 3,224 cf |
| Secondary = | 0.00 cfs @ 0.00 hrs, Volume= | 0 cf |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 96.76' @ 50.90 hrs Surf.Area= 8,364 sf Storage= 4,178 cf

Plug-Flow detention time= 1,649.0 min calculated for 3,224 cf (45% of inflow) Center-of-Mass det. time= 931.9 min (2,417.9 - 1,486.0)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|---|
| #1 | 96.17' | 1,866 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 4,603 cf | 25.25'W x 202.98'L x 3.50'H Field A |
| | | | 17,938 cf Overall - 6,432 cf Embedded = 11,506 cf x 40.0% Voids |
| #3A | 96.17' | 6,432 cf | ADS_StormTech SC-740 +Cap x 140 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 140 Chambers in 5 Rows |
| | | 12 000 of | Total Available Storage |

12,900 cf I otal Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void (% | ds Inc.Store %) (cubic-feet) | Cum.Store (cubic-feet) | |
|------------------|-----------|----------------------|------------|---------------------------------|---------------------------|------------------------------|
| 96.1 | 17 | 3,239 | 0. | .0 0 | 0 | |
| 97.6 | 67 | 3,239 | 35. | .0 1,700 | 1,700 | |
| 97.8 | 33 | 3,239 | 15. | .0 78 | 1,778 | |
| 98.0 |)1 | 3,239 | 15. | .0 87 | 1,866 | |
| Device | Routina | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | 07' | 0.5" Vert Restricti | on Orifice C= 0 | 600 |
| | i innary | - | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | PE Underdrain L | = 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | = 92.17' / 90.37' | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. F | Perforations X 40 | 0.00 columns |
| | | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bre | eadth Broad-Cres | ted Rectangular Weir |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | | |
| | | | | Coef. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3.3 | 32 | |

Primary OutFlow Max=0.01 cfs @ 50.90 hrs HW=96.76' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.01 cfs @ 10.40 fps) 2=6" HDPE Underdrain (Passes 0.01 cfs of 0.41 cfs potential flow) 3=Perforations (Passes 0.01 cfs of 7.74 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs) Site1HillsboroughMunicpComplex_20240628NOAA 24-hr C2-Year_2100 Rainfall=3.97"Prepared by Rutgers Cooperative Extension Water Resources ProgramPrinted 6/29/2024HydroCAD® 10.10-7cs/n 03601© 2022 HydroCAD Software Solutions LLCPage 68

Pond 12P: Underground Storage w/ Porous Pavement 6 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

28 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 200.98' Row Length +12.0" End Stone x 2 = 202.98' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

140 Chambers x 45.9 cf = 6,431.6 cf Chamber Storage

17,938.1 cf Field - 6,431.6 cf Chambers = 11,506.5 cf Stone x 40.0% Voids = 4,602.6 cf Stone Storage

Chamber Storage + Stone Storage = 11,034.2 cf = 0.253 af Overall Storage Efficiency = 61.5% Overall System Size = 202.98' x 25.25' x 3.50'

140 Chambers 664.4 cy Field 426.2 cy Stone





Pond 12P: Underground Storage w/ Porous Pavement 6

Site1HillsboroughMunicpComplex_20240628NOAA 24-hr C2-Year _2100 Rainfall=3.97"Prepared by Rutgers Cooperative Extension Water Resources ProgramPrinted 6/29/2024HydroCAD® 10.10-7cs/n 03601© 2022 HydroCAD Software Solutions LLCPage 70

Summary for Link 1L: Offsite Flows

| Inflow A | Area = | 927,363 sf, | 3.35% Impervious, | Inflow Depth = | 1.64" | for 2-Year | _2100 event |
|----------|--------|-------------|--------------------|----------------|----------|-------------|-------------|
| Inflow | = | 24.16 cfs @ | 12.33 hrs, Volume= | 126,634 c | f | | |
| Primar | y = | 24.16 cfs @ | 12.33 hrs, Volume= | 126,634 c | f, Atter | n= 0%, Lag= | 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Hydrograph _ _ _ _ _ _ Inflow Primary 24 16 cfs 26 24.16 cfs Inflow Area=927,363 sf 24 22 20 18 16 Flow (cfs) 14 12-10-8 6 4 2 0 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 Time (hours)

Link 1L: Offsite Flows

Site1HillsboroughMunicpComplex_20240628VOAA 24-hr C 2-Year_Current Rainfall=3.34"Prepared by Rutgers Cooperative Extension Water Resources ProgramPrinted 6/29/2024HydroCAD® 10.10-7c s/n 03601 © 2022 HydroCAD Software Solutions LLCPage 71

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| Subcatchment1S: DA1: CN w/ IC | Runoff Area=56,173 sf 73.47% Impervious Runoff Depth=2.60" Flow Length=361' Tc=14.3 min CN=75/98 Runoff=2.92 cfs 12,163 cf |
|--|---|
| Subcatchment 1Sa: Existing RG 1_W | est_ Runoff Area=22,637 sf 64.43% Impervious Runoff Depth=2.47" Flow Length=361' Tc=14.3 min CN=77/98 Runoff=1.13 cfs 4,657 cf |
| Subcatchment1Sb: DA1: CN w/ IC | Runoff Area=39,105 sf 68.25% Impervious Runoff Depth=2.50" Flow Length=361' Tc=14.3 min CN=75/98 Runoff=1.96 cfs 8,141 cf |
| Subcatchment 2S: DA 2: CN w/ IC are | eas Runoff Area=58,249 sf 86.46% Impervious Runoff Depth=2.86" Flow Length=391' Tc=7.0 min CN=76/98 Runoff=4.15 cfs 13,862 cf |
| Subcatchment 3S: DA 3: CN w/ IC | Runoff Area=158,623 sf 63.48% Impervious Runoff Depth=2.43" Flow Length=441' Tc=8.3 min CN=76/98 Runoff=9.39 cfs 32,109 cf |
| Subcatchment 3Sa: Existing RG 2 From the second sec | ont DA Runoff Area=25,889 sf 48.62% Impervious Runoff Depth=2.25" Tc=8.3 min CN=79/98 Runoff=1.45 cfs 4,858 cf |
| Subcatchment3Sb: RG 1 DA | Runoff Area=21,388 sf 65.14% Impervious Runoff Depth=2.42" Flow Length=441' Tc=8.3 min CN=74/98 Runoff=1.25 cfs 4,310 cf |
| Subcatchment3Sc: DA 3: CN w/ IC a | reas Runoff Area=111,346 sf 66.62% Impervious Runoff Depth=2.47" Flow Length=441' Tc=8.3 min CN=75/98 Runoff=6.67 cfs 22,891 cf |
| Subcatchment4S: DA 4: CN w/ IC | Runoff Area=86,816 sf 90.62% Impervious Runoff Depth=2.93" Flow Length=143' Tc=8.4 min CN=75/98 Runoff=6.05 cfs 21,176 cf |
| Subcatchment4Sa: RG 4 DA | Runoff Area=24,369 sf 57.53% Impervious Runoff Depth=2.40" Flow Length=143' Tc=8.4 min CN=79/98 Runoff=1.43 cfs 4,874 cf |
| Subcatchment4Sb: DA 4: CN w/ IC a | reas Runoff Area=72,797 sf 88.81% Impervious Runoff Depth=2.89" Flow Length=143' Tc=8.4 min CN=75/98 Runoff=5.02 cfs 17,547 cf |
| Subcatchment5S: DA 5: CN w/ IC | Runoff Area=78,058 sf 72.85% Impervious Runoff Depth=2.62" Flow Length=310' Tc=11.5 min CN=77/98 Runoff=4.44 cfs 17,042 cf |
| Subcatchment5Sa: RG 3 DA | Runoff Area=19,898 sf 48.83% Impervious Runoff Depth=2.26" Flow Length=310' Tc=11.5 min CN=79/98 Runoff=1.00 cfs 3,740 cf |
| Subcatchment5Sb: DA 5: CN w/ IC a | reas Runoff Area=58,163 sf 81.07% Impervious Runoff Depth=2.74" Flow Length=310' Tc=11.5 min CN=75/98 Runoff=3.44 cfs 13,300 cf |
| Subcatchment6S: DA 6: CN w/ IC are | eas Runoff Area=32,033 sf 45.19% Impervious Runoff Depth=2.19" Flow Length=276' Tc=14.0 min CN=79/98 Runoff=1.47 cfs 5,859 cf |
| Subcatchment 7S: DA 7 (Offsite Sout | h): Runoff Area=107,001 sf 18.84% Impervious Runoff Depth=1.70" Flow Length=309' Tc=14.5 min CN=78/98 Runoff=3.84 cfs 15,183 cf |

Site1HillsboroughMunicpComplex_20240628VOAA 24-hr C 2-Year _Current Rainfall=3.34"Prepared by Rutgers Cooperative Extension Water Resources ProgramPrinted 6/29/2024HydroCAD® 10.10-7c s/n 03601 © 2022 HydroCAD Software Solutions LLCPage 72

| Subcatchment8S: DA 8 (Offsite North): CN Runoff Area=340,642 sf 1.94% Impervious Runoff Depth=1.17' Flow Length=976' Tc=19.4 min CN=74/98 Runoff=7.46 cfs 33,187 cf |
|---|
| Subcatchment9S: DA 9 (Offsite Field Runoff Area=479,720 sf 0.89% Impervious Runoff Depth=1.09' Flow Length=1,468' Tc=30.4 min CN=73/98 Runoff=7.77 cfs 43,637 cf |
| Subcatchment 31S: RG 2 DARunoff Area=32,035 sf 32.46% ImperviousRunoff Depth=1.98Flow Length=276'Tc=14.0 minCN=79/98Runoff=1.35 cfs 5,293 cf |
| Reach 1R: Existing Bioswale West 1 Avg. Flow Depth=0.18' Max Vel=1.81 fps Inflow=1.13 cfs 4,657 cf n=0.035 L=33.0' S=0.0227 '/' Capacity=7.36 cfs Outflow=1.12 cfs 4,657 cf |
| Reach 2R: Bioswale E 1 RG 3 Avg. Flow Depth=0.25' Max Vel=2.22 fps Inflow=1.00 cfs 3,740 cfs n=0.035 L=35.0' S=0.0286 '/' Capacity=4.02 cfs Outflow=0.99 cfs 3,740 cfs |
| Pond 1P: Exising Rain Garden 1 WestPeak Elev=100.31' Storage=1,831 cfInflow=1.12 cfs4,657 cfPrimary=0.24 cfs3,637 cfSecondary=0.71 cfs848 cfOutflow=0.95 cfs4,484 cf |
| Pond 2P: Underground Storage w/ Porous Peak Elev=97.01' Storage=10,372 cf Inflow=2.58 cfs 12,625 cf Primary=0.01 cfs 3,492 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 3,492 cf |
| Pond 3P: Underground Storage w/ Porous Peak Elev=97.05' Storage=12,809 cf Inflow=4.15 cfs 13,862 cf Primary=0.01 cfs 3,546 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 3,546 cf |
| Pond 4P: Existing Rain Garden 2 FrontPeak Elev=101.12' Storage=2,880 cfInflow=1.45 cfs4,858 cfPrimary=0.15 cfs3,674 cfSecondary=0.03 cfs61 cfOutflow=0.18 cfs3,735 cf |
| Pond 5P: Proposed Rain Garden 1 (South Primary=0.18 cfs 3,513 cf Secondary=0.14 cfs 250 cf Outflow=0.32 cfs 3,763 cf |
| Pond 6P: Underground Storage w/ Porous Peak Elev=96.91' Storage=26,914 cf Inflow=6.68 cfs 30,390 cf Primary=0.01 cfs 3,482 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 3,482 cf |
| Pond 7P: Proposed Rain Garden 4 (North) Peak Elev=100.22' Storage=2,3/1 cf Inflow=1.43 cfs 4,8/4 cf Primary=0.20 cfs 3,818 cf Secondary=0.30 cfs 545 cf Outflow=0.51 cfs 4,363 cf |
| Primary=0.01 cfs 3,515 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 3,515 cf Primary=0.01 cfs 3,515 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 3,515 cf |
| Primary=0.20 cfs 3,238 cf Secondary=0.26 cfs 369 cf Outflow=0.46 cfs 3,607 cf |
| Primary=0.01 cfs 3,521 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 3,521 cf Primary=0.01 cfs 3,521 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 3,521 cf |
| Primary=0.20 cfs 5,263 cf Secondary=0.17 cfs 386 cf Outflow=0.36 cfs 5,649 cf |
| Primary=0.01 cfs 3,111 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 3,111 cf |

Link 1L: Offsite Flows

Inflow=17.10 cfs 92,008 cf Primary=17.10 cfs 92,008 cf
Total Runoff Area = 1,824,942 sf Runoff Volume = 283,830 cf Average Runoff Depth = 1.87" 63.76% Pervious = 1,163,653 sf 36.24% Impervious = 661,289 sf

Summary for Subcatchment 1S: DA1: CN w/ IC areas_original

Runoff = 2.92 cfs @ 12.22 hrs, Volume= 12,163 cf, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| | A | rea (sf) | CN | Description | | | | | |
|---|-------------|------------------|-----------------|--------------------------|-------------------|--|--|--|--|
| * | | 2,053 | 79 | Open space | e (fair) C | | | | |
| * | | 12,848 | 74 | Open space | e (good) C | | | | |
| * | | 41,272 | 98 | Impervious | , | | | | |
| | | 56,173 | 92 | Weighted A | verage | | | | |
| | 14,901 75 | | | 26.53% Pei | | | | | |
| | | 41,272 | 98 | 73.47% Impervious Area | | | | | |
| | Tc (min) | Length (feet) | Slope (ft/ft | e Velocity) (ft/sec) | Capacity (cfs) | Description | | | |
| | 12.2 | 100 | 0.0109 | 0.14 | | Sheet Flow, Sheet flow Grass: Short n= 0.150 P2= 3.34" | | | |
| | 0.2 | 33 | 0.0280 |) 2.69 | | Shallow Concentrated Flow, SCF - unpaved Unpaved Kv= 16.1 fps | | | |
| | 1.9 | 228 | 0.0095 | 5 1.98 | | Shallow Concentrated Flow, SCF - Paved parking lot Paved Kv= 20.3 fps | | | |
| | 14.3 | 361 | Total | | | | | | |

Subcatchment 1S: DA1: CN w/ IC areas_original



Summary for Subcatchment 1Sa: Existing RG 1_West_ DA

Runoff = 1.13 cfs @ 12.22 hrs, Volume= 4,657 cf, Depth= 2.47" Routed to Reach 1R : Existing Bioswale West 1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| | A | rea (sf) | CN | Description | | | | | |
|---|-------------|----------------------------------|-----------------------------|--------------------------|-------------------|--|--|--|--|
| * | | 5,569 | 79 | Open space | e (fair) C - F | Portion from DA 9 the field | | | |
| * | | 14,584 | 98 | Impervious | Parking Lo | t | | | |
| * | | 2,484 | 74 | OPen Spac | e (Good) C | C - Portion from DA1 | | | |
| | | 22,637 | 91 | Weighted A | verage | | | | |
| | | 8,053 | 053 77 35.57% Pervious Area | | | | | | |
| | | 14,584 98 64.43% Impervious Area | | | | | | | |
| | Tc (min) | Length (feet) | Slope (ft/ft | e Velocity) (ft/sec) | Capacity (cfs) | Description | | | |
| | 12.2 | 100 | 0.0109 | 0.14 | | Sheet Flow, Sheet flow Grass: Short n= 0.150 P2= 3.34" | | | |
| | 0.2 | 33 | 0.0280 |) 2.69 | | Shallow Concentrated Flow, SCF - unpaved Unpaved Kv= 16.1 fps | | | |
| | 1.9 | 228 | 0.0095 | 5 1.98 | | Shallow Concentrated Flow, SCF - Paved parking lot Paved Kv= 20.3 fps | | | |
| - | 44.0 | 0.04 | T · · | | | | | | |

14.3 361 Total

Subcatchment 1Sa: Existing RG 1_West_ DA



Summary for Subcatchment 1Sb: DA1: CN w/ IC areas_Remaining

Runoff = 1.96 cfs @ 12.22 hrs, Volume= 8,141 cf, Depth= 2.50" Routed to Pond 2P : Underground Storage w/ Porous Pavement 1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| | A | rea (sf) | CN | Description | | |
|--------------------|--------------------------------|----------|--------|-------------|--|--|
| * | | 2,053 | 79 | Open space | e (fair) C | |
| * | | 10,364 | 74 | Open space | e (good) C | |
| * | | 26,688 | 98 | Impervious | , | |
| _ | | 39,105 | 91 | Weighted A | verage | |
| | 12,417 75 31.75% Pervious Area | | | | | |
| | | 26,688 | 98 | 68.25% Imp | pervious Ar | ea |
| | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | |
| | 12.2 | 100 | 0.0109 | 9 0.14 | | Sheet Flow, Sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| 0.2 33 0.0280 2.69 | | |) 2.69 | | Shallow Concentrated Flow, SCF - unpaved | |
| | | | | | | Unpaved Kv= 16.1 fps |
| | 1.9 | 228 | 0.0095 | 5 1.98 | | Shallow Concentrated Flow, SCF - Paved parking lot |
| | | | | | | Paved Kv= 20.3 fps |
| | 14.3 | 361 | Total | | | |

Subcatchment 1Sb: DA1: CN w/ IC areas_Remaining



Summary for Subcatchment 2S: DA 2: CN w/ IC areas

Runoff = 4.15 cfs @ 12.14 hrs, Volume= 13,862 cf, Depth= 2.86" Routed to Pond 3P : Underground Storage w/ Porous Pavement 2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| _ | A | rea (sf) | CN | Description | | | | |
|-------------------------------|-------|----------|--------|-------------|--------------|--|--|--|
| * | | 3,767 | 79 | Open space | e (Fair) C | | | |
| * | | 4,118 | 74 | Open Spac | e (good) C | | | |
| * | | 50,364 | 98 | Impervious | mpervious | | | |
| 58,249 95 Weighted Average | | | | | verage | | | |
| 7,885 76 13.54% Pervious Area | | | | | rvious Area | | | |
| | | 50,364 | 98 | 86.46% Im | pervious Are | ea | | |
| | | | | | | | | |
| | Tc | Length | Slope | e Velocity | Capacity | Description | | |
| _ | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | | |
| | 4.8 | 18 | 0.0037 | 7 0.06 | | Sheet Flow, Sheet flow - grass | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | |
| | 2.2 | 373 | 0.0186 | 6 2.77 | | Shallow Concentrated Flow, SCF _ paved | | |
| | | | | | | Paved Kv= 20.3 fps | | |
| | 7.0 | 391 | Total | | | | | |

Subcatchment 2S: DA 2: CN w/ IC areas



Summary for Subcatchment 3S: DA 3: CN w/ IC areas_Original

Runoff = 9.39 cfs @ 12.15 hrs, Volume= 32,109 cf, Depth= 2.43"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| _ | A | rea (sf) | CN | Description | | | |
|--------------------------------|-------|----------|------------|-------------------|-------------|--|--|
| * | | 18,715 | 79 | Open space | e (Fair) C | | |
| * | | 39,208 | 74 | Open space | e (good) C | | |
| * | 1 | 00,700 | 98 | Impervious | ίο γ | | |
| 158,623 90 Weighted Average | | | | Weighted A | verage | | |
| 57,923 76 36.52% Pervious Area | | | | 36.52% Pe | rvious Area | | |
| 100,700 98 63.48 | | | 63.48% Imp | % Impervious Area | | | |
| | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | |
| _ | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | |
| | 5.8 | 83 | 0.0489 | 0.24 | | Sheet Flow, sheet flow - grass | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | |
| | 2.5 | 358 | 0.0138 | 3 2.38 | | Shallow Concentrated Flow, SCF - paved | |
| | | | | | | Paved Kv= 20.3 fps | |
| | 8.3 | 441 | Total | | | | |

Subcatchment 3S: DA 3: CN w/ IC areas_Original



Summary for Subcatchment 3Sa: Existing RG 2 Front DA

Runoff = 1.45 cfs @ 12.15 hrs, Volume= 4,858 cf, Depth= 2.25" Routed to Pond 4P : Existing Rain Garden 2 Front

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| | Area (sf) | CN | Description | | | | | |
|-----|------------|------|----------------------------------|--|--|--|--|--|
| * | 6,507 | 98 | Impervious Roof Top | | | | | |
| * | 966 | 98 | Gravel surface, HSG C - Path | | | | | |
| * | 5,114 | 98 | npervious Sidewalk | | | | | |
| | 13,302 | 79 | -75% Grass cover, Fair, HSG C | | | | | |
| | 25,889 | 88 | 38 Weighted Average | | | | | |
| | 13,302 | 79 | 51.38% Pervious Area | | | | | |
| | 12,587 | 98 | 48.62% Impervious Area | | | | | |
| - | Tc Length | Slop | be Velocity Capacity Description | | | | | |
| (mi | in) (feet) | (ft/ | ft) (ft/sec) (cfs) | | | | | |
| 0 |)) | | Direct Entry | | | | | |



Direct Entry,

Subcatchment 3Sa: Existing RG 2 Front DA



Summary for Subcatchment 3Sb: RG 1 DA

Runoff = 1.25 cfs @ 12.15 hrs, Volume= 4,310 cf, Depth= 2.42" Routed to Pond 5P : Proposed Rain Garden 1 (South West)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| | A | rea (sf) | CN | Description | | | | | | |
|---|-------|----------|--------|-------------|---------------------|--|--|--|--|--|
| * | | 7,455 | 74 | Open space | pen space (good) C | | | | | |
| * | | 10,303 | 98 | Impervious | pervious - Roof top | | | | | |
| * | | 3,630 | 98 | Impervious | - Road / Si | dewalk | | | | |
| | | 21,388 | 90 | Weighted A | verage | | | | | |
| | | 7,455 | 74 | 34.86% Pe | rvious Area | | | | | |
| | | 13,933 | 98 | 65.14% Imp | pervious Ar | ea | | | | |
| | | | | - | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | | |
| | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | | | | |
| | 5.8 | 83 | 0.0489 | 9 0.24 | | Sheet Flow, sheet flow - grass | | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | | |
| | 2.5 | 358 | 0.0138 | 8 2.38 | | Shallow Concentrated Flow, SCF - paved | | | | |
| | | | | | | Paved Kv= 20.3 fps | | | | |
| | 8.3 | 441 | Total | | | | | | | |

Subcatchment 3Sb: RG 1 DA



Summary for Subcatchment 3Sc: DA 3: CN w/ IC areas Remaining

Runoff = 6.67 cfs @ 12.15 hrs, Volume= 22,891 cf, Depth= 2.47" Routed to Pond 6P : Underground Storage w/ Porous Pavement 3

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| | A | rea (sf) | CN | Description | | |
|----------------------------------|-------|----------|--------|-------------|--------------|--|
| * | | 5,413 | 79 | Open space | e (Fair) C | |
| * | | 31,753 | 74 | Open space | e (good) C | |
| * | | 74,180 | 98 | Impervious | (0) | |
| 111,346 90 Weighted Ave | | | | Weighted A | verage | |
| 37,166 75 33.38% Pervious Area | | | | | rvious Area | |
| 74,180 98 66.62% Impervious Area | | | | 66.62% Imp | pervious Are | ea |
| | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description |
| _ | (min) | (feet) | (ft/ft | i) (ft/sec) | (cfs) | |
| | 5.8 | 83 | 0.048 | 9 0.24 | | Sheet Flow, sheet flow - grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 2.5 | 358 | 0.013 | 8 2.38 | | Shallow Concentrated Flow, SCF - paved |
| | | | | | | Paved Kv= 20.3 fps |
| | 8.3 | 441 | Total | | | |

Subcatchment 3Sc: DA 3: CN w/ IC areas Remaining



Hydrograph

Summary for Subcatchment 4S: DA 4: CN w/ IC areas_original

Runoff = 6.05 cfs @ 12.15 hrs, Volume= 21,176 cf, Depth= 2.93"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| | A | rea (sf) | CN | Description | | | | | |
|---|-------|----------|--------|---------------------|-------------|--|--|--|--|
| * | | 1,403 | 79 | Open space (fair) C | | | | | |
| * | | 446 | 84 | Open space | e (fair) D | | | | |
| * | | 6,298 | 74 | Open space | e (good) C | | | | |
| * | | 78,669 | 98 | Impervious | , | | | | |
| | | 86,816 | 96 | Weighted A | verage | | | | |
| | | 8,147 | 75 | 9.38% Perv | ious Area | | | | |
| | | 78,669 | 98 | 90.62% Imp | pervious Ar | ea | | | |
| | | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | |
| | (min) | (feet) | (ft/ft | :) (ft/sec) | (cfs) | | | | |
| | 7.9 | 67 | 0.0144 | 4 0.14 | | Sheet Flow, sheet flow - grass | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| | 0.5 | 76 | 0.015 | 5 2.53 | | Shallow Concentrated Flow, SCF - Paved | | | |
| | | | | | | Paved Kv= 20.3 fps | | | |
| | 8.4 | 143 | Total | | | | | | |

Subcatchment 4S: DA 4: CN w/ IC areas_original



Summary for Subcatchment 4Sa: RG 4 DA

Runoff = 1.43 cfs @ 12.15 hrs, Volume= 4,874 cf, Depth= 2.40" Routed to Pond 7P : Proposed Rain Garden 4 (North)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| | A | rea (sf) | CN | Description | | | | | | |
|--|-------------|------------------|-----------------|-------------------------------|-------------------|---|--|--|--|--|
| * | | 10,350 | 79 | Open space (fair) C from DA 8 | | | | | | |
| <u>14,019 98 Impervious Parkinglot</u> 24,369 90 Weighted Average 10,350 79 42.47% Pervious Area | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | 14,019 | 98 | 57.53% Impervious Area | | | | | | |
| | Tc (min) | Length (feet) | Slope (ft/ft | e Velocity) (ft/sec) | Capacity (cfs) | Description | | | | |
| | 7.9 | 67 | 0.0144 | 4 0.14 | | Sheet Flow, sheet flow - grass Grass: Short n= 0.150 P2= 3.34" | | | | |
| | 0.5 | 76 | 0.0155 | 5 2.53 | | Shallow Concentrated Flow, SCF - Paved Paved Kv= 20.3 fps | | | | |
| | 0.4 | 110 | T . 4 . 1 | | | | | | | |

8.4 143 Total

Subcatchment 4Sa: RG 4 DA



Summary for Subcatchment 4Sb: DA 4: CN w/ IC areas

Runoff = 5.02 cfs @ 12.15 hrs, Volume= 17,547 cf, Depth= 2.89" Routed to Pond 8P : Underground Storage w/ Porous Pavement 4

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| | A | rea (sf) | CN | Description | | |
|---|-------|----------|--------|-------------|-------------|--|
| * | | 1,403 | 79 | Open space | e (fair) C | |
| * | | 446 | 84 | Open space | e (fair) D | |
| * | | 6,298 | 74 | Open space | e (good) C | |
| * | | 64,650 | 98 | Impervious | , | |
| | | 72,797 | 95 | Weighted A | verage | |
| | | 8,147 | 75 | 11.19% Per | vious Area | |
| | | 64,650 | 98 | 88.81% Imp | pervious Ar | ea |
| | | | | | | |
| | Tc | Length | Slope | e Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | |
| | 7.9 | 67 | 0.0144 | 4 0.14 | | Sheet Flow, sheet flow - grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 0.5 | 76 | 0.0155 | 5 2.53 | | Shallow Concentrated Flow, SCF - Paved |
| _ | | | | | | Paved Kv= 20.3 fps |
| | 8.4 | 143 | Total | | | |

Subcatchment 4Sb: DA 4: CN w/ IC areas



Summary for Subcatchment 5S: DA 5: CN w/ IC areas_Original

Runoff = 4.44 cfs @ 12.19 hrs, Volume= 17,042 cf, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| _ | A | rea (sf) | CN | Description | | |
|----------------------------------|-------|----------|---------|-------------|--------------|--|
| * | | 11,294 | 79 | Open Spac | e (Fair) C | |
| * | | 9,899 | 74 | Open Spac | e (good) C | |
| * | | 56,865 | 98 | Impervious | (0) | |
| 78.058 92 Weighted Average | | | | | | |
| 21,193 77 27.15% Pervious Area | | | | | vious Area | |
| 56,865 98 72.85% Impervious Area | | | | 72.85% Imp | pervious Are | ea |
| | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description |
| _ | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | |
| | 8.7 | 64 | 0.0105 | 0.12 | | Sheet Flow, Sheet flow -grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 1.3 | 179 | 0.0129 | 2.31 | | Shallow Concentrated Flow, SCF - paved |
| | | | | | | Paved Kv= 20.3 fps |
| | 1.5 | 67 | 0.0120 | 0.77 | | Shallow Concentrated Flow, SCF _ grass |
| _ | | | | | | Short Grass Pasture Kv= 7.0 fps |
| | 11.5 | 310 | Total | | | |

Subcatchment 5S: DA 5: CN w/ IC areas_Original



Summary for Subcatchment 5Sa: RG 3 DA

Runoff = 1.00 cfs @ 12.19 hrs, Volume= 3,740 cf, Depth= 2.26" Routed to Reach 2R : Bioswale E 1 RG 3

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| | A | rea (sf) | CN | Description | | | | | | |
|---|-------|----------|---------|-------------|--------------------|--|--|--|--|--|
| * | | 10,182 | 79 | Open Spac | pen Space (Fair) C | | | | | |
| * | | 9,716 | 98 | Impervious | Parking lot | | | | | |
| | | 19,898 | 88 | Weighted A | verage | | | | | |
| | | 10,182 | 79 | 51.17% Pei | vious Area | | | | | |
| | | 9,716 | 98 | 48.83% Imp | pervious Are | ea | | | | |
| | | | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | | |
| _ | (min) | (feet) | (ft/ft) |) (ft/sec) | (cfs) | | | | | |
| | 8.7 | 64 | 0.0105 | 5 0.12 | | Sheet Flow, Sheet flow -grass | | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | | |
| | 1.3 | 179 | 0.0129 | 2.31 | | Shallow Concentrated Flow, SCF - paved | | | | |
| | | | | | | Paved Kv= 20.3 fps | | | | |
| | 1.5 | 67 | 0.0120 | 0.77 | | Shallow Concentrated Flow, SCF _ grass | | | | |
| | | | | | | Short Grass Pasture Kv= 7.0 fps | | | | |
| | | | | | | | | | | |

11.5 310 Total

Subcatchment 5Sa: RG 3 DA



Summary for Subcatchment 5Sb: DA 5: CN w/ IC areas

Runoff = 3.44 cfs @ 12.19 hrs, Volume= 13,300 cf, Depth= 2.74" Routed to Pond 10P : Underground Storage w/ Porous Pavement 5

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| | A | rea (sf) | CN I | Description | | | | | |
|---------------------|---|----------|---------|---------------------|--|---------------------------------|--|--|--|
| * | | 1,112 | 79 (| Open Space (Fair) C | | | | | |
| * | | 9,899 | 74 (| Open Space | e (good) C | | | | |
| * | | 47,152 | 98 I | mpervious | | | | | |
| | 58,163 94 Weighted Average | | | | | | | | |
| | 11,011 75 18.93% Pervious Area | | | | | | | | |
| | | 47,152 | 98 8 | 31.07% Imp | ervious Ar | ea | | | |
| | | | | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description | | | |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | | | | |
| | 8.7 | 64 | 0.0105 | 0.12 | | Sheet Flow, Sheet flow -grass | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| 1.3 179 0.0129 2.31 | | | 2.31 | | Shallow Concentrated Flow, SCF - paved | | | | |
| | | | | | | Paved Kv= 20.3 fps | | | |
| | 1.5 67 0.0120 0.77 Shallow Concentrated Flow, SCF grass | | | | | | | | |
| | | | | | | Short Grass Pasture Kv= 7.0 fps | | | |

11.5 310 Total

Subcatchment 5Sb: DA 5: CN w/ IC areas



Summary for Subcatchment 6S: DA 6: CN w/ IC areas

Runoff = 1.47 cfs @ 12.22 hrs, Volume= 5,859 cf, Depth= 2.19" Routed to Pond 11P : Proposed Rain Garden 2 (East)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| | А | rea (sf) | CN | Description | | |
|---|-------|----------|---------|--------------------------|--------------|--|
| * | | 16,559 | 79 | Open Spac | e (fair) C | |
| * | | 998 | 74 | Open Spac | e (good) C | |
| * | | 14,476 | 98 | Impervious | | |
| | | 32,033 | 87 | Weighted A | verage | |
| | | 17,557 | 79 | 54.8 [ँ] 1% Pei | vious Area | |
| | | 14,476 | 98 | 45.19% Imp | pervious Are | ea |
| | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | · · · · · · · · · · · · · · · · · · · |
| | 12.8 | 100 | 0.0098 | 0.13 | | Sheet Flow, Sheet flow - grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 0.5 | 86 | 0.0244 | 3.17 | | Shallow Concentrated Flow, SCF - paved |
| | | | | | | Paved Kv= 20.3 fps |
| | 0.7 | 90 | 0.0178 | 2.15 | | Shallow Concentrated Flow, SCF - unpaved |
| | | | | | | Unpaved Kv= 16.1 fps |

14.0 276 Total

Subcatchment 6S: DA 6: CN w/ IC areas



Summary for Subcatchment 7S: DA 7 (Offsite South): CN w/ IC areas

Runoff = 3.84 cfs @ 12.23 hrs, Volume= 15,183 cf, Depth= 1.70" Routed to Link 1L : Offsite Flows

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| | A | rea (sf) | CN E | Description | | | | |
|--------------------------------|---------------------------------|----------|--------------|-----------------------|------------|--|--|--|
| * | | 70,444 | 79 C | 9 Open Space (fair) C | | | | |
| * | | 16,401 | 74 C | Dpen Spac | e (good) C | | | |
| * | | 20,156 | 98 l | mpervious | | | | |
| 107,001 82 Weighted Average | | | | | verage | | | |
| 86,845 78 81.16% Pervious Area | | | | | vious Area | | | |
| | 20,156 98 18.84% Impervious Are | | | | | ea | | |
| | | | | | o | | | |
| | , IC | Length | Slope | Velocity | Capacity | Description | | |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | | | |
| | 12.1 | 100 | 0.0112 | 0.14 | | Sheet Flow, Sheet flow | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | |
| | 2.2 | 165 | 0.0305 | 1.22 | | Shallow Concentrated Flow, SCF _ grass | | |
| | | | | | | Short Grass Pasture Kv= 7.0 fps | | |
| | 0.2 | 44 | 0.0317 | 3.61 | | Shallow Concentrated Flow, SCF _ paved | | |
| _ | | | | | | Paved Kv= 20.3 fps | | |
| | | | — · · | | | | | |

14.5 309 Total

Subcatchment 7S: DA 7 (Offsite South): CN w/ IC areas



Summary for Subcatchment 8S: DA 8 (Offsite North): CN w/ IC areas

Runoff = 7.46 cfs @ 12.30 hrs, Volume= 33 Routed to Link 1L : Offsite Flows

33,187 cf, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| | A | rea (sf) | CN | Description | | |
|---|-------|----------|--------|--------------|--------------|---|
| * | | 2,767 | 70 | Brush (fair) | С | |
| * | | 63,031 | 77 | Brush (fair) | D | |
| * | | 86,643 | 65 | Brush (goo | d) C | |
| * | | 64,708 | 73 | Brush (goo | d) D | |
| * | | 73,083 | 79 | Open space | e (Fair) C | |
| * | | 30,261 | 84 | Open space | e (fair) D | |
| * | | 4,460 | 74 | Open space | e (good) C | |
| * | | 9,087 | 80 | Open space | e (good) D | |
| * | | 6,602 | 98 | Impervious | | |
| | 3 | 40,642 | 75 | Weighted A | verage | |
| | 3 | 34,040 | 74 | 98.06% Pe | rvious Area | |
| | | 6,602 | 98 | 1.94% Impe | ervious Area | а |
| | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | |
| | 7.5 | 100 | 0.036 | 6 0.22 | | Sheet Flow, sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 11.9 | 876 | 0.006 | 7 1.23 | | Shallow Concentrated Flow, scf - grass waterway |
| | | | | | | Grassed Waterway Kv= 15.0 fps |
| | 19.4 | 976 | Total | | | |



Subcatchment 8S: DA 8 (Offsite North): CN w/ IC areas

Summary for Subcatchment 9S: DA 9 (Offsite Field West): CN w/ IC areas

Runoff = 7.77 cfs @ 12.46 hrs, Volume= 43,637 cf, Depth= 1.09" Routed to Link 1L : Offsite Flows

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| | A | rea (sf) | CN | Description | | |
|--------------------------------|-------|----------|---------|-------------|--------------|---|
| * | | 72,478 | 65 | Brush (goo | d) C | |
| * | | 10,448 | 79 | Open spcae | e (fair) C | |
| * | 3 | 92,515 | 74 | Open Spac | e (good) C | |
| * | | 4,279 | 98 | Impervious | | |
| | 4 | 79,720 | 73 | Weighted A | verage | |
| | 4 | 75,441 | 73 | 99.11% Pei | rvious Area | |
| 4,279 98 0.89% Impervious Area | | | | | ervious Area | а |
| | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | |
| | 10.5 | 100 | 0.0159 | 0.16 | | Sheet Flow, Sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 7.1 | 362 | 0.0148 | 0.85 | | Shallow Concentrated Flow, SCF - grass |
| | | | | | | Short Grass Pasture Kv= 7.0 fps |
| | 12.8 | 1,006 | 0.0076 | 1.31 | | Shallow Concentrated Flow, SCF - grass waterway |
| | | | | | | Grassed Waterway Kv= 15.0 fps |
| | 30.4 | 1.468 | Total | | | |

Subcatchment 9S: DA 9 (Offsite Field West): CN w/ IC areas



Summary for Subcatchment 31S: RG 2 DA

Runoff = 1.35 cfs @ 12.22 hrs, Volume= 5,293 cf, Depth= 1.98"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

| | A | rea (sf) | CN | Description | | |
|---------------------------------|----------------------------|------------------|-----------------|--|-------------------|---|
| * | | 21,638 | 79 | Open Spac | e (fair) C | |
| * | | 10,397 | 98 | Impervious | · · · | |
| | 32,035 85 Weighted Average | | | Weighted A | verage | |
| 21,638 79 67.54% Pervious Area | | | | | vious Area | |
| 10,397 98 32.46% Impervious Are | | | | | pervious Ar | ea |
| (| Tc (min) | Length (feet) | Slope (ft/ft | e Velocity) (ft/sec) | Capacity (cfs) | Description |
| | 12.8 | 100 | 0.0098 | 3 0.13 | | Sheet Flow, Sheet flow - grass Grass: Short n= 0.150 P2= 3.34" |
| | 0.5 86 0.0244 3.17 | | | Shallow Concentrated Flow, SCF - paved Paved Kv= 20.3 fps | | |
| | 0.7 | 90 | 0.0178 | 3 2.15 | | Shallow Concentrated Flow, SCF - unpaved Unpaved Kv= 16.1 fps |
| | 14.0 | 276 | Total | | | |

Subcatchment 31S: RG 2 DA



Summary for Reach 1R: Existing Bioswale West 1

Inflow Area = 22,637 sf, 64.43% Impervious, Inflow Depth = 2.47" for 2-Year Current event Inflow 1.13 cfs @ 12.22 hrs, Volume= 4.657 cf = 1.12 cfs @ 12.23 hrs, Volume= Outflow = 4,657 cf, Atten= 1%, Lag= 0.6 min Routed to Pond 1P : Exising Rain Garden 1 West Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Max. Velocity= 1.81 fps, Min. Travel Time= 0.3 min Avg. Velocity = 0.49 fps, Avg. Travel Time= 1.1 min Peak Storage= 21 cf @ 12.22 hrs Average Depth at Peak Storage= 0.18', Surface Width= 4.06' Bank-Full Depth= 0.50' Flow Area= 2.3 sf, Capacity= 7.36 cfs 3.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds Side Slope Z-value= 3.0 '/' Top Width= 6.00' Length= 33.0' Slope= 0.0227 '/' Inlet Invert= 100.75', Outlet Invert= 100.00' ‡ Reach 1R: Existing Bioswale West 1 Hydrograph Inflow 1.13 cfs Outflow 1.12 cfs Inflow Area=22,637 sf Avg. Flow Depth=0.18' Max Vel=1.81 fps n=0.035 (cfs) L=33.0' Flow S=0.0227 '/' Capacity=7.36 cfs 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72

Time (hours)

Summary for Reach 2R: Bioswale E 1 RG 3



Summary for Pond 1P: Exising Rain Garden 1 West

[93] Warning: Storage range exceeded by 0.06'

[62] Hint: Exceeded Reach 1R OUTLET depth by 0.15' @ 12.35 hrs

| Inflow Area = | | 22,637 sf, | 64.43% Impervious, | Inflow Depth = 2.47" | for 2-Year _Current event |
|---------------|---------|---------------|-----------------------|----------------------|---------------------------|
| Inflow | = | 1.12 cfs @ | 12.23 hrs, Volume= | 4,657 cf | |
| Outflow | = | 0.95 cfs @ | 12.32 hrs, Volume= | 4,484 cf, Atter | n= 15%, Lag= 5.6 min |
| Primary | = | 0.24 cfs @ | 12.32 hrs, Volume= | 3,637 cf | - |
| Routed | to Ponc | 2P : Undergi | round Storage w/ Poro | us Pavement 1 | |
| Secondary | = | 0.71 cfs @ | 12.32 hrs, Volume= | 848 cf | |
| Routed | to Ponc | d 2P : Underg | round Storage w/ Poro | us Pavement 1 | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.31' @ 12.32 hrs Surf.Area= 1,750 sf Storage= 1,831 cf

Plug-Flow detention time= 624.6 min calculated for 4,484 cf (96% of inflow) Center-of-Mass det. time= 601.9 min (1,385.6 - 783.7)

| Volume | Invert | Avail.Stor | | age Storage Desc | ription | | | | |
|------------------|-----------|--------------------|-------|--|---|---|--|--|--|
| #1 | 98.25' | | 1,83 | 1 cf Custom Stag | f Custom Stage Data (Conic)Listed below (Recalc) | | | | |
| Elevatio (fee | on Su | rf.Area (sɑ-ft) | Void | s Inc.Store | Cum.Store (cubic-feet) | Wet.Area (sg-ft) | | | |
| 08 (| 25 | 1 445 | 0.0 | 0 0 | 0 | 1 445 | | | |
| 00.2 00 2 | 25 | 1,445 | 35 (| 0 506 | 506 | 1,440 | | | |
| 99.4 | 50 | 1,445 | 25 (| 0 90 | 596 | 1 613 | | | |
| 100 (| 0 | 1,110 | 100 (| 0 798 | 1 394 | 1 927 | | | |
| 100.2 | 25 | 1,750 | 100.0 | 0 438 | 1,831 | 1,964 | | | |
| Device | Routing | Inv | vert | Outlet Devices | | | | | |
| #1 Primary | | 98 | .15' | 4.0" Round Culve Inlet / Outlet Invert= n= 0.020 Corrugate 0.5" Vert Restricti | 0" Round Culvert L= 11.0' Ke= 0.500 let / Outlet Invert= 98.15' / 98.09' S= 0.0055 '/' Cc= 0.900 = 0.020 Corrugated PE, corrugated interior, Flow Area= 0.09 sf 5" Vort Postrictive Orifice C= 0.600 | | | | |
| #2 | Device | 50.10 | | Limited to weir flow at low heads | | | | | |
| #3 | Device 2 | 98 | .25' | 4.0" Round 4" HD Inlet / Outlet Invert= n= 0.020 Corrugate | Round 4" HDPE Underdrain L= 20.0' Ke= 0.500 / Outlet Invert= 98.25' / 98.15' S= 0.0050 '/' Cc= 0.900 020 Corrugated PE corrugated interior Elow Area= 0.09 sf | | | | |
| #4 | Device 3 | 98 | .25' | 0.9" x 0.1" Horiz. Perforations X 400.00 columns | | | | | |
| #5 | Device 1 | 100 | .00' | 4.0" Horiz. Drainte | ch Atrium C= 0.6 | 00 | | | |
| #6 | Secondary | 100 | .10' | 3.0' long x 2.0' bre Head (feet) 0.20 0 2.50 3.00 3.50 Coef. (English) 2.5 2.85 3.07 3.20 3.3 | adth Broad-Crest .40 0.60 0.80 1.0 4 2.61 2.61 2.60 | ed Rectangular Weir D 1.20 1.40 1.60 1.80 2.00 2.66 2.70 2.77 2.89 2.88 | | | |

Primary OutFlow Max=0.24 cfs @ 12.32 hrs HW=100.30' (Free Discharge) 1=Culvert (Passes 0.24 cfs of 0.43 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.02 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.33 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.17 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.23 cfs @ 2.62 fps)

Secondary OutFlow Max=0.66 cfs @ 12.32 hrs HW=100.30' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 0.66 cfs @ 1.13 fps)



Pond 1P: Exising Rain Garden 1 West

Summary for Pond 2P: Underground Storage w/ Porous Pavement 1

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | | 61,742 sf, | 66.85% Ir | npervious, | Inflow Depth > | 2.45" | for 2-Ye | ear_C | Current event |
|---------------|---|------------|------------|------------|----------------|----------|-----------|-------|---------------|
| Inflow = | 2 | 2.58 cfs @ | 12.29 hrs, | Volume= | 12,625 c | f | | | |
| Outflow = | (|).01 cfs @ | 24.45 hrs, | Volume= | 3,492 c | f, Atten | i= 99%, I | _ag= | 729.3 min |
| Primary = | (|).01 cfs @ | 24.45 hrs, | Volume= | 3,492 c | f | | - | |
| Secondary = | (| 0.00 cfs @ | 0.00 hrs, | Volume= | 0 c | f | | | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 97.01' @ 24.45 hrs Surf.Area= 13,421 sf Storage= 10,372 cf

Plug-Flow detention time= 1,677.6 min calculated for 3,490 cf (28% of inflow) Center-of-Mass det. time= 1,310.2 min (2,305.3 - 995.0)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 1,612 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 9,359 cf | 72.75'W x 146.02'L x 3.50'H Field A |
| | | | 37,179 cf Overall - 13,782 cf Embedded = 23,397 cf x 40.0% Voids |
| #3A | 96.17' | 13,782 cf | ADS_StormTech SC-740 +Cap x 300 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 300 Chambers in 15 Rows |
| | | 24 752 of | Total Available Storage |

24,753 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevation (feet) | | Surf.Area (sq-ft) | Void (% | ls Inc.Store 6) (cubic-feet) | Cum.Store (cubic-feet) | | | | |
|---------------------|----------|----------------------|------------|--|---|------------------------------|--|--|--|
| 96.1 | 17 | 2,798 | 0. | .0 0 | 0 | | | | |
| 97.6 | 67 | 2,798 | 35. | .0 1,469 | 1,469 | | | | |
| 97.8 | 33 | 2,798 | 15. | .0 67 | 1,536 | | | | |
| 98.0 |)1 | 2,798 | 15. | .0 76 | 1,612 | | | | |
| Device | Routing | In | vert | Outlet Devices | | | | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | 0.5" Vert. Restriction Orifice C= 0.600 | | | | |
| | | | | Limited to weir flow | at low heads | | | | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | 6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 | | | | |
| | | | | Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 '/' Cc= 0.900 | | | | | |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf | | | |
| #3 | Device 2 | 92.17' | | 0.9" x 0.1" Horiz. Perforations X 400.00 columns | | | | | |
| | | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads | | | |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bre | adth Broad-Cres | ted Rectangular Weir | | | |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 | | | |
| | | | | 2.50 3.00 3.50 | | | | | |
| | | | | Coef. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 | | | |
| | | | | 2.85 3.07 3.20 3.3 | 32 | | | | |

Primary OutFlow Max=0.01 cfs @ 24.45 hrs HW=97.01' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.01 cfs @ 10.68 fps) 2=6" HDPE Underdrain (Passes 0.01 cfs of 0.42 cfs potential flow) 3=Perforations (Passes 0.01 cfs of 7.95 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2P: Underground Storage w/ Porous Pavement 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

20 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 144.02' Row Length +12.0" End Stone x 2 = 146.02' Base Length 15 Rows x 51.0" Wide + 6.0" Spacing x 14 + 12.0" Side Stone x 2 = 72.75' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

300 Chambers x 45.9 cf = 13,782.0 cf Chamber Storage

37,179.5 cf Field - 13,782.0 cf Chambers = 23,397.5 cf Stone x 40.0% Voids = 9,359.0 cf Stone Storage

Chamber Storage + Stone Storage = 23,141.0 cf = 0.531 af Overall Storage Efficiency = 62.2% Overall System Size = 146.02' x 72.75' x 3.50'

300 Chambers 1,377.0 cy Field 866.6 cy Stone





Pond 2P: Underground Storage w/ Porous Pavement 1

Summary for Pond 3P: Underground Storage w/ Porous Pavement 2

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 58,249 sf, 86.46% Impervious, | Inflow Depth = 2.86" for 2-Year _Current event |
|---------------|-------------------------------|--|
| Inflow = | 4.15 cfs @ 12.14 hrs, Volume= | 13,862 cf |
| Outflow = | 0.01 cfs @ 24.14 hrs, Volume= | 3,546 cf, Atten= 100%, Lag= 720.1 min |
| Primary = | 0.01 cfs @ 24.14 hrs, Volume= | 3,546 cf |
| Secondary = | 0.00 cfs @ 0.00 hrs, Volume= | 0 cf |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 97.05' @ 24.14 hrs Surf.Area= 23,296 sf Storage= 12,809 cf

Plug-Flow detention time= 1,717.8 min calculated for 3,543 cf (26% of inflow) Center-of-Mass det. time= 1,509.6 min (2,273.1 - 763.5)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 8,187 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 8,029 cf | 82.25'W x 110.42'L x 3.50'H Field A |
| | | | 31,786 cf Overall - 11,715 cf Embedded = 20,071 cf x 40.0% Voids |
| #3A | 96.17' | 11,715 cf | ADS_StormTech SC-740 +Cap x 255 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 255 Chambers in 17 Rows |
| | | 27 021 of | Total Available Storage |

27,931 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void %) | Inc.Store Cum.Store (cubic-feet) (cubic-feet) | | | |
|------------------|-----------|----------------------|------------|--|----------------------------|--|--|
| 96.1 | 17 | 14,214 | 0.0 | 0 0 | | | |
| 97.6 | 67 | 14,214 | 35. | 7,462 7,462 | | | |
| 97.8 | 33 | 14,214 | 15. | 341 7,803 | | | |
| 98.0 |)1 | 14,214 | 15. | 384 8,187 | | | |
| Device | Routing | In | vert | Outlet Devices | | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restriction Orifice C= 0.60 | 0 | | |
| | | | | Limited to weir flow at low heads | | | |
| #2 | Device 1 | 92 | .17' | 7' 6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 | | | |
| | | | | Inlet / Outlet Invert= 92.17' / 90.37' S= | 0.0050 '/' Cc= 0.900 | | |
| | | | | n= 0.020 Corrugated PE, corrugated in | terior, Flow Area= 0.20 sf | | |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. Perforations X 400.0 | 0 columns | | |
| | | | | X 3 rows C= 0.600 Limited to weir flow | at low heads | | |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' breadth Broad-Creste | d Rectangular Weir | | |
| | | | | Head (feet) 0.20 0.40 0.60 0.80 1.00 | 1.20 1.40 1.60 1.80 2.00 | | |
| | | | | | | | |
| | | | | Coet. (English) 2.54 2.61 2.61 2.60 2 | 2.66 2.70 2.77 2.89 2.88 | | |
| | | | | 2.85 3.07 3.20 3.32 | | | |

Primary OutFlow Max=0.01 cfs @ 24.14 hrs HW=97.05' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.01 cfs @ 10.73 fps) 2=6" HDPE Underdrain (Passes 0.01 cfs of 0.42 cfs potential flow) 3=Perforations (Passes 0.01 cfs of 7.98 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P: Underground Storage w/ Porous Pavement 2 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

15 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 108.42' Row Length +12.0" End Stone x 2 = 110.42' Base Length 17 Rows x 51.0" Wide + 6.0" Spacing x 16 + 12.0" Side Stone x 2 = 82.25' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

255 Chambers x 45.9 cf = 11,714.7 cf Chamber Storage

31,786.2 cf Field - 11,714.7 cf Chambers = 20,071.5 cf Stone x 40.0% Voids = 8,028.6 cf Stone Storage

Chamber Storage + Stone Storage = 19,743.3 cf = 0.453 af Overall Storage Efficiency = 62.1% Overall System Size = 110.42' x 82.25' x 3.50'

255 Chambers 1,177.3 cy Field 743.4 cy Stone





Pond 3P: Underground Storage w/ Porous Pavement 2

Summary for Pond 4P: Existing Rain Garden 2 Front

25,889 sf, 48.62% Impervious, Inflow Depth = 2.25" for 2-Year Current event Inflow Area = Inflow = 1.45 cfs @ 12.15 hrs, Volume= 4.858 cf 0.18 cfs @ 12.91 hrs, Volume= Outflow = 3,735 cf, Atten= 88%, Lag= 45.2 min 0.15 cfs @ 12.91 hrs, Volume= Primary = 3,674 cf Routed to Pond 6P : Underground Storage w/ Porous Pavement 3 0.03 cfs @ 12.91 hrs, Volume= Secondary = 61 cf Routed to Pond 6P : Underground Storage w/ Porous Pavement 3

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 101.12' @ 12.91 hrs Surf.Area= 3,045 sf Storage= 2,880 cf

Plug-Flow detention time= 971.4 min calculated for 3,733 cf (77% of inflow) Center-of-Mass det. time= 883.8 min (1,672.4 - 788.6)

| <u>Volume</u> | Invert | Avail.S | Storage | Storage Descrip | tion | | | |
|---------------|-----------|-----------|--|--|---|--|--|--|
| #1 | 99.25' | 3 | 8,267 cf | Custom Stage I | Data (Conic)Listed | below (Recalc) | | |
| Elevatio | on Su | rf.Area V | /oids | Inc.Store | Cum.Store | Wet.Area | | |
| (fee | et) | (sq-ft) | (%) | (cubic-feet) | (cubic-feet) | <u>(sq-ft)</u> | | |
| 99.2 | 25 | 2,635 | 0.0 | 0 | 0 | 2,635 | | |
| 100.2 | 25 | 2,635 | 35.0 | 922 | 922 | 2,817 | | |
| 100.5 | 50 | 2,635 | 25.0 | 165 | 1,087 | 2,862 | | |
| 101.0 | 00 | 3,045 1 | 00.0 | 1,419 | 2,506 | 3,283 | | |
| 101.2 | 25 | 3,045 1 | 00.0 | 761 | 3,267 | 3,332 | | |
| Device | Routing | Inve | rt Outl | et Devices | | | | |
| #1 | Primary | 99.1 | 5' 4.0'' Inlet n= 0 | Round Culvert / Outlet Invert= 9 .020 Corrugated | L= 11.0' Ke= 0.50 9.15' / 99.09' S= 0 PE. corrugated inte | 00 0.0055 '/' Cc= 0.900 erior. Flow Area= 0.09 sf | | |
| #2 | Device 1 | 99.1 | 5' 0.5'' Limi | 0.5" Vert. Restrictive Orifice C= 0.600 | | | | |
| #3 | Device 2 | 99.2 | 5' 4.0'' Inlet n= 0 | 4.0" Round 4" HDPE Underdrain L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 99.25' / 99.15' S= 0.0050 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior. Flow Area= 0.09 sf | | | | |
| #4 | Device 3 | 99.2 | 5' 0.9'' X 3 | 0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads | | | | |
| #5 | Device 1 | 101.0 | 0' 4.0'' | Horiz. Draintech | Atrium C= 0.600 |) | | |
| #6 | Secondary | 101.1 | 0' 3.0' Hea 2.50 Coe 2.85 | long x 2.0' bread d (feet) 0.20 0.4(3.00 3.50 f. (English) 2.54 3.07 3.20 3.32 | Sth Broad-Crested 0 0.60 0.80 1.00 2.61 2.61 2.60 2. | Rectangular Weir 1.20 1.40 1.60 1.80 2.00 66 2.70 2.77 2.89 2.88 | | |

| Site1HillsboroughMunicpComplex_20240628VOAA 24-hr C 2-Year_ | <i>Current Rainfall=3.34"</i> |
|---|-------------------------------|
| Prepared by Rutgers Cooperative Extension Water Resources Program | Printed 6/29/2024 |
| HydroCAD® 10.10-7c s/n 03601 © 2022 HydroCAD Software Solutions LLC | Page 107 |

Primary OutFlow Max=0.16 cfs @ 12.91 hrs HW=101.12' (Free Discharge) 1=Culvert (Passes 0.16 cfs of 0.41 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 6.73 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.32 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 4.94 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.15 cfs @ 1.69 fps)

Secondary OutFlow Max=0.03 cfs @ 12.91 hrs HW=101.12' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 0.03 cfs @ 0.38 fps)



Pond 4P: Existing Rain Garden 2 Front

Summary for Pond 5P: Proposed Rain Garden 1 (South West)

21,388 sf, 65.14% Impervious, Inflow Depth = 2.42" for 2-Year Current event Inflow Area = Inflow = 1.25 cfs @ 12.15 hrs, Volume= 4.310 cf 0.32 cfs @ 12.48 hrs, Volume= Outflow = 3,763 cf, Atten= 74%, Lag= 19.5 min 0.18 cfs @ 12.48 hrs, Volume= Primary = 3,513 cf Routed to Pond 6P : Underground Storage w/ Porous Pavement 3 0.14 cfs @ 12.48 hrs, Volume= Secondary = 250 cf Routed to Pond 6P : Underground Storage w/ Porous Pavement 3

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 101.17' @ 12.48 hrs Surf.Area= 2,325 sf Storage= 2,278 cf

Plug-Flow detention time= 879.5 min calculated for 3,763 cf (87% of inflow) Center-of-Mass det. time= 817.3 min (1,593.4 - 776.1)

| Volume | Invert | Avail.S | torage | e Storage Description | | | | |
|--|----------------------------|--|---|--|---|--|--|--|
| #1 | 99.25' | 2, | 466 cf | Custom Stage Data (Conic)Listed below (Recalc) | | | | |
| Elevatio (fee | on Su et) | rf.Area Vo (sq-ft) | oids (%) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) | | |
| 99.2 100.2 100.5 101.0 101.2 | 25 25 50 00 25 | 1,970 1,970 1,970 2,325 2,325 10 2,325 | 0.0 35.0 25.0 00.0 00.0 | 0 690 123 1,073 581 | 0 690 813 1,885 2,466 | 1,970 2,127 2,167 2,531 2,574 | | |
| Device | Routing | Inver | t Outl | et Devices | | | | |
| #1 | Primary | 99.15 | ' 4.0" Inlet n= 0 | Round Culvert / Outlet Invert= 99 0.020 Corrugated | L= 11.0' Ke= 0.50 9.15' / 99.09' S= 0 PE, corrugated inte | 00 0.0055 '/' Cc= 0.900 erior, Flow Area= 0.09 sf | | |
| #2 | Device | 33.10 | Limi | ted to weir flow at | low heads | | | |
| #3 | Device 2 | 99.25 | ' 4.0'' Inlet n= 0 | 4.0" Round 4" HDPE Underdrain L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 99.25' / 99.15' S= 0.0050 '/' Cc= 0.900 n= 0.020 Corrugated PE corrugated interior Flow Area= 0.09 sf | | | | |
| #4 | Device 3 | 99.25 | ' 0.9'' X 3 | 0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads | | | | |
| #5 | Device 1 | 101.00 | ' 4.0'' Limi | 4.0" Horiz. Draintech Atrium C= 0.600 Limited to weir flow at low heads | | | | |
| #6 | Secondary | 101.10 | ' 3.0' Hea 2.50 Coe 2.85 | long x 2.0' bread d (feet) 0.20 0.40 3.00 3.50 f. (English) 2.54 3.07 3.20 3.32 | Ith Broad-Crested 0 0.60 0.80 1.00 2.61 2.61 2.60 2. | Rectangular Weir 1.20 1.40 1.60 1.80 2.00 66 2.70 2.77 2.89 2.88 | | |
Primary OutFlow Max=0.18 cfs @ 12.48 hrs HW=101.17' (Free Discharge) 1=Culvert (Passes 0.18 cfs of 0.41 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 6.81 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.32 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.00 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.17 cfs @ 1.98 fps)

Secondary OutFlow Max=0.14 cfs @ 12.48 hrs HW=101.17' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 0.14 cfs @ 0.67 fps)



Summary for Pond 6P: Underground Storage w/ Porous Pavement 3

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 158,623 sf, 63.48% Impervious, | Inflow Depth > 2.30" for 2-Year _Current event |
|---------------|--------------------------------|--|
| Inflow = | 6.68 cfs @ 12.15 hrs, Volume= | 30,390 cf |
| Outflow = | 0.01 cfs @ 67.33 hrs, Volume= | 3,482 cf, Atten= 100%, Lag= 3,310.4 min |
| Primary = | 0.01 cfs @ 67.33 hrs, Volume= | 3,482 cf |
| Secondary = | 0.00 cfs @ 0.00 hrs, Volume= | 0 cf |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 96.91' @ 67.33 hrs Surf.Area= 38,014 sf Storage= 26,914 cf

Plug-Flow detention time= 1,820.4 min calculated for 3,479 cf (11% of inflow) Center-of-Mass det. time= 1,314.5 min (2,301.4 - 986.9)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|---|
| #1 | 96.17' | 4,287 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 26,630 cf | 106.00'W x 288.42'L x 3.50'H Field A |
| | | | 107,003 cf Overall - 40,427 cf Embedded = 66,575 cf x 40.0% Voids |
| #3A | 96.17' | 40,427 cf | ADS_StormTech SC-740 +Cap x 880 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 880 Chambers in 22 Rows |
| | | 71 244 of | Total Available Storage |

71,344 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Voic (% | ds Inc.Store %) (cubic-feet) | Cum.Store (cubic-feet) | |
|------------------|-----------|----------------------|------------|---------------------------------|---------------------------|------------------------------|
| 96.1 | 17 | 7,442 | 0. | 0.0 0.0 | 0 | |
| 97.6 | 67 | 7,442 | 35. | 5.0 3,907 | 3,907 | |
| 97.8 | 33 | 7,442 | 15. | 5.0 179 | 4,086 | |
| 98.0 |)1 | 7,442 | 15. | 5.0 201 | 4,287 | |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | on Orifice C= 0. | 600 |
| | | | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | PE Underdrain L | = 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | = 92.17' / 90.37' S | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. F | Perforations X 40 | 0.00 columns |
| | | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bre | eadth Broad-Cres | ted Rectangular Weir |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | | |
| | | | | Coet. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3.3 | 32 | |

Primary OutFlow Max=0.01 cfs @ 67.33 hrs HW=96.91' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.01 cfs @ 10.56 fps) 2=6" HDPE Underdrain (Passes 0.01 cfs of 0.42 cfs potential flow) 3=Perforations (Passes 0.01 cfs of 7.86 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 6P: Underground Storage w/ Porous Pavement 3 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

40 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 286.42' Row Length +12.0" End Stone x 2 = 288.42' Base Length 22 Rows x 51.0" Wide + 6.0" Spacing x 21 + 12.0" Side Stone x 2 = 106.00' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

880 Chambers x 45.9 cf = 40,427.2 cf Chamber Storage

107,002.6 cf Field - 40,427.2 cf Chambers = 66,575.4 cf Stone x 40.0% Voids = 26,630.1 cf Stone Storage

Chamber Storage + Stone Storage = 67,057.4 cf = 1.539 af Overall Storage Efficiency = 62.7% Overall System Size = 288.42' x 106.00' x 3.50'

880 Chambers 3,963.1 cy Field 2,465.8 cy Stone





Pond 6P: Underground Storage w/ Porous Pavement 3

Summary for Pond 7P: Proposed Rain Garden 4 (North)

24,369 sf, 57.53% Impervious, Inflow Depth = 2.40" for 2-Year Current event Inflow Area = Inflow = 1.43 cfs @ 12.15 hrs, Volume= 4.874 cf 0.51 cfs @ 12.38 hrs, Volume= Outflow = 4,363 cf, Atten= 65%, Lag= 13.4 min 0.20 cfs @ 12.38 hrs, Volume= 3.818 cf Primary = Routed to Pond 8P : Underground Storage w/ Porous Pavement 4 0.30 cfs @ 12.38 hrs, Volume= Secondary = 545 cf Routed to Pond 8P : Underground Storage w/ Porous Pavement 4

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2 Peak Elev= 100.22' @ 12.38 hrs Surf.Area= 2,435 sf Storage= 2,371 cf

Plug-Flow detention time= 763.8 min calculated for 4,363 cf (90% of inflow) Center-of-Mass det. time= 709.6 min (1,491.6 - 782.0)

| <u>Volume</u> | Invert | Avail. | Storage | Storage Descrip | tion | |
|---------------|-----------|-----------|---|---|--|---|
| #1 | 98.25' | : | 2,453 cf | Custom Stage I | Data (Conic)Listed | below (Recalc) |
| Elevatio | on Su | rf.Area 🕚 | Voids | Inc.Store | Cum.Store | Wet.Area |
| (fee | et) | (sq-ft) | (%) | (cubic-feet) | (cubic-feet) | <u>(sq-ft)</u> |
| 98.2 | 25 | 1,870 | 0.0 | 0 | 0 | 1,870 |
| 99.2 | 25 | 1,870 | 35.0 | 655 | 655 | 2,023 |
| 99.5 | 50 | 1,870 | 25.0 | 117 | 771 | 2,062 |
| 100.0 | 00 | 2,435 | 100.0 | 1,073 | 1,845 | 2,633 |
| 100.2 | 25 | 2,435 | 100.0 | 609 | 2,453 | 2,676 |
| Device | Routing | Inve | ert Outl | et Devices | | |
| #1 | Primary | 98.1 | 15' 4.0'' Inlet n= 0 | Round Culvert / Outlet Invert= 9 .020 Corrugated | L= 11.0' Ke= 0.50 8.15' / 98.09' S= 0 PE. corrugated inte | 0 .0055 '/' Cc= 0.900 erior. Flow Area= 0.09 sf |
| #2 | Device 1 | 98.1 | 15' 0.5'' Limi | Vert. Restrictive ted to weir flow at | Orifice C= 0.600 low heads | , |
| #3 | Device 2 | 98.2 | 25' 4.0'' Inlet n= 0 | Round 4" HDPE / Outlet Invert= 9 0.020 Corrugated | Underdrain L= 20 8.25' / 98.15' S= 0 PE. corrugated inte | 0.0' Ke= 0.500 .0050 '/' Cc= 0.900 erior. Flow Area= 0.09 sf |
| #4 | Device 3 | 98.2 | 25' 0.9'' X 3 | x 0.1" Horiz. Per rows C= 0.600 L | forations X 400.00 |) columns at low heads |
| #5 | Device 1 | 100.0 |)0' 4.0'' Limi | Horiz. Draintech | Atrium C= 0.600 | |
| #6 | Secondary | 100.1 | 10' 3.0' Hea 2.50 Coe 2.85 | long x 2.0' bread d (feet) 0.20 0.40 3.00 3.50 f. (English) 2.54 5 3.07 3.20 3.32 | Broad-Crested 0.60 0.80 1.00 2.61 2.61 2.60 2. | Rectangular Weir 1.20 1.40 1.60 1.80 2.00 66 2.70 2.77 2.89 2.88 |

| Site1HillsboroughMunicpComplex_20240628VOAA 24-hr C 2-Year_ | Current Rainfall=3.34" |
|---|------------------------|
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Primary OutFlow Max=0.20 cfs @ 12.38 hrs HW=100.22' (Free Discharge) 1=Culvert (Passes 0.20 cfs of 0.42 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 6.88 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.33 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.06 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.20 cfs @ 2.23 fps)

Secondary OutFlow Max=0.30 cfs @ 12.38 hrs HW=100.22' (Free Discharge) G=Broad-Crested Rectangular Weir (Weir Controls 0.30 cfs @ 0.86 fps)



Pond 7P: Proposed Rain Garden 4 (North)

Summary for Pond 8P: Underground Storage w/ Porous Pavement 4

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 97,166 sf, 80.96% Impervious, | Inflow Depth > 2.71" for 2-Year _Current event |
|---------------|---|--|
| Inflow = | 5.04 cfs @ 12.15 hrs, Volume= | 21,910 cf |
| Outflow = | 0.01 cfs @ 24.41 hrs, Volume= | 3,515 cf, Atten= 100%, Lag= 735.3 min |
| Primary = | 0.01 cfs @ 24.41 hrs, Volume= | 3,515 cf |
| Secondary = | 0.00 cfs $\overline{@}$ 0.00 hrs, Volume= | 0 cf |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 96.95' @ 24.41 hrs Surf.Area= 33,612 sf Storage= 19,505 cf

Plug-Flow detention time= 1,779.0 min calculated for 3,515 cf (16% of inflow) Center-of-Mass det. time= 1,378.7 min (2,287.3 - 908.6)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 9,112 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 15,592 cf | 63.25'W x 281.30'L x 3.50'H Field A |
| | | | 62,272 cf Overall - 23,292 cf Embedded = 38,980 cf x 40.0% Voids |
| #3A | 96.17' | 23,292 cf | ADS_StormTech SC-740 +Cap x 507 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 507 Chambers in 13 Rows |
| | | 47.006 of | Total Available Storage |

47,996 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void (% | s Inc.Store b) (cubic-feet) | Cum.Store (cubic-feet) | |
|------------------|-----------|----------------------|------------|--------------------------------|---------------------------|------------------------------|
| 96.1 | 17 | 15,820 | 0. | 0 0 | 0 | |
| 97.6 | 67 | 15,820 | 35. | 0 8,306 | 8,306 | |
| 97.8 | 33 | 15,820 | 15. | 0 380 | 8,685 | |
| 98.0 |)1 | 15,820 | 15. | 0 427 | 9,112 | |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | on Orifice C= 0. | 600 |
| | 2 | | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | PE Underdrain L | = 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | = 92.17' / 90.37' S | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. F | Perforations X 40 | 0.00 columns |
| | | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bre | eadth Broad-Cres | ted Rectangular Weir |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | | |
| | | | | Coef. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3.3 | 32 | |

Primary OutFlow Max=0.01 cfs @ 24.41 hrs HW=96.95' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.01 cfs @ 10.62 fps) 2=6" HDPE Underdrain (Passes 0.01 cfs of 0.42 cfs potential flow) 3=Perforations (Passes 0.01 cfs of 7.90 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 8P: Underground Storage w/ Porous Pavement 4 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

39 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 279.30' Row Length +12.0" End Stone x 2 = 281.30' Base Length
13 Rows x 51.0" Wide + 6.0" Spacing x 12 + 12.0" Side Stone x 2 = 63.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

507 Chambers x 45.9 cf = 23,291.6 cf Chamber Storage

62,272.0 cf Field - 23,291.6 cf Chambers = 38,980.5 cf Stone x 40.0% Voids = 15,592.2 cf Stone Storage

Chamber Storage + Stone Storage = 38,883.8 cf = 0.893 af Overall Storage Efficiency = 62.4% Overall System Size = 281.30' x 63.25' x 3.50'

507 Chambers 2,306.4 cy Field 1,443.7 cy Stone



Pond 8P: Underground Storage w/ Porous Pavement 4

Summary for Pond 9P: Proposed Rain Garden 3 (North East)

[62] Hint: Exceeded Reach 2R OUTLET depth by 0.05' @ 12.50 hrs

Inflow Area = 19,898 sf, 48.83% Impervious, Inflow Depth = 2.26" for 2-Year Current event 0.99 cfs @ 12.20 hrs, Volume= Inflow = 3,740 cf 0.46 cfs @ 12.41 hrs, Volume= Outflow = 3,607 cf, Atten= 53%, Lag= 12.6 min 0.20 cfs @ 12.41 hrs, Volume= Primary = 3,238 cf Routed to Pond 10P : Underground Storage w/ Porous Pavement 5 0.26 cfs @ 12.41 hrs, Volume= Secondary = 369 cf Routed to Pond 10P : Underground Storage w/ Porous Pavement 5

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.21' @ 12.41 hrs Surf.Area= 1,670 sf Storage= 1,678 cf

Plug-Flow detention time= 733.5 min calculated for 3,607 cf (96% of inflow) Center-of-Mass det. time= 711.9 min (1,504.1 - 792.2)

| Volume | Invert | Avail | l.Stora | age Storage Descr | iption | |
|----------------|--------------|--------------------|---------|--|---|---|
| #1 | 98.25' | | 1,751 | 1 cf Custom Stage | e Data (Conic)Liste | d below (Recalc) |
| Elevati (fe | on Su et) | rf.Area (sɑ-ft) | Voids | s Inc.Store | Cum.Store (cubic-feet) | Wet.Area (sg-ft) |
| 98 | 25 | 1 385 | 0.0 |) 0 | 0 | 1 385 |
| 99. | 25 | 1,385 | 35.0 |) 485 | 485 | 1,500 |
| 99. | | 1.385 | 25.0 |) 87 | 571 | 1.550 |
| 100. | 00 | 1,670 | 100.0 | 763 | 1,334 | 1,843 |
| 100. | 25 | 1,670 | 100.0 |) 418 | 1,751 | 1,879 |
| Device | Routing | ١n | /ert | Outlet Devices | | |
| #1 | Primary | 98. | .15' | 4.0" Round Culver Inlet / Outlet Invert= n= 0.020 Corrugate | t L= 11.0' Ke= 0.5 98.15'/98.09' S= d PE. corrugated in | 500 0.0055 '/' Cc= 0.900 terior. Flow Area= 0.09 sf |
| #2 | Device 1 | 98. | .15' | 0.5" Vert. Restrictiv | ve Orifice Č= 0.60 at low heads | 0 |
| #3 | Device 2 | 98. | .25' | 4.0" Round 4" HDI Inlet / Outlet Invert= | PE Underdrain L= 98.25' / 98.15' S= | 20.0' Ke= 0.500 0.0050 '/' Cc= 0.900 terior Elow Area= 0.09 sf |
| #4 | Device 3 | 98. | .25' | 0.9" x 0.1" Horiz. P X 3 rows C= 0.600 | erforations X 400.0 Limited to weir flow |)0 columns v at low heads |
| #5 | Device 1 | 100. | .00' | 4.0" Horiz. Drainted | ch Atrium C= 0.60 | 00 |
| #6 | Secondary | 100. | .10' | 3.0' long x 2.0' bre Head (feet) 0.20 0. 2.50 3.00 3.50 Coef. (English) 2.54 2.85 3.07 3.20 3.3 | adth Broad-Creste 40 0.60 0.80 1.00 4 2.61 2.61 2.60 2 | d Rectangular Weir 1.20 1.40 1.60 1.80 2.00 2.66 2.70 2.77 2.89 2.88 |

| Site1HillsboroughMunicpComplex_20240628VOAA 24-hr C 2-Year_ | Current Rainfall=3.34" |
|---|------------------------|
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Primary OutFlow Max=0.20 cfs @ 12.41 hrs HW=100.21' (Free Discharge) 1=Culvert (Passes 0.20 cfs of 0.42 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 6.87 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.33 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.05 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.19 cfs @ 2.18 fps)

Secondary OutFlow Max=0.26 cfs @ 12.41 hrs HW=100.21' (Free Discharge) G=Broad-Crested Rectangular Weir (Weir Controls 0.26 cfs @ 0.82 fps)



Summary for Pond 10P: Underground Storage w/ Porous Pavement 5

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 78,061 sf, 72.85% Impervious, | Inflow Depth > 2.60" for 2-Year _Current event |
|---------------|-------------------------------|--|
| Inflow = | 3.44 cfs @ 12.19 hrs, Volume= | 16,907 cf |
| Outflow = | 0.01 cfs @ 24.36 hrs, Volume= | 3,521 cf, Atten= 100%, Lag= 729.8 min |
| Primary = | 0.01 cfs @ 24.36 hrs, Volume= | 3,521 cf |
| Secondary = | 0.00 cfs @ 0.00 hrs, Volume= | 0 cf |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 96.98' @ 24.36 hrs Surf.Area= 27,852 sf Storage= 14,650 cf

Plug-Flow detention time= 1,726.9 min calculated for 3,521 cf (21% of inflow) Center-of-Mass det. time= 1,359.6 min (2,286.3 - 926.7)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 9,426 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 10,110 cf | 63.25'W x 181.62'L x 3.50'H Field A |
| | | | 40,205 cf Overall - 14,931 cf Embedded = 25,275 cf x 40.0% Voids |
| #3A | 96.17' | 14,931 cf | ADS_StormTech SC-740 +Cap x 325 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 325 Chambers in 13 Rows |
| | | 24 467 of | Total Available Starage |

34,467 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevation (feet) | | Surf.Area (sq-ft) | Void (% | ls Inc.Store | Cum.Store (cubic-feet) | | | |
|---------------------|----------|----------------------|---|---|---------------------------|-----------------------------|--|--|
| 96.1 | 17 | 16,365 | 0. | 0 0 | 0 | | | |
| 97.6 | 67 | 16,365 | 35. | 0 8,592 | 8,592 | | | |
| 97.8 | 33 | 16,365 | 15. | 0 393 | 8,984 | | | |
| 98.0 |)1 | 16,365 | 15. | 0 442 | 9,426 | | | |
| Device | Routing | In | vert | Outlet Devices | | | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | on Orifice C= 0. | 600 | | |
| | - | | | Limited to weir flow at low heads | | | | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 | | | | |
| | | | | Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 '/' Cc= 0.900 | | | | |
| | | | | n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf | | | | |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. Perforations X 400.00 columns | | | | |
| | | | X 3 rows C= 0.600 Limited to weir flow at low heads | | | | | |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' breadth Broad-Crested Rectangular Weir | | | | |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 | | |
| | | | | 2.50 3.00 3.50 | | | | |
| | | | | Coef. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 | | |
| | | | | 2.85 3.07 3.20 3.3 | 32 | | | |

Primary OutFlow Max=0.01 cfs @ 24.36 hrs HW=96.98' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.01 cfs @ 10.65 fps) 2=6" HDPE Underdrain (Passes 0.01 cfs of 0.42 cfs potential flow) 3=Perforations (Passes 0.01 cfs of 7.92 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs) Site1HillsboroughMunicpComplex_20240628Concent Content Rainfall=3.34"Prepared by Rutgers Cooperative Extension Water Resources ProgramPrinted 6/29/2024HydroCAD® 10.10-7cs/n 036012022 HydroCAD Software Solutions LLCPage 124

Pond 10P: Underground Storage w/ Porous Pavement 5 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

25 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 179.62' Row Length +12.0" End Stone x 2 = 181.62' Base Length 13 Rows x 51.0" Wide + 6.0" Spacing x 12 + 12.0" Side Stone x 2 = 63.25' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

325 Chambers x 45.9 cf = 14,930.5 cf Chamber Storage

40,205.4 cf Field - 14,930.5 cf Chambers = 25,274.9 cf Stone x 40.0% Voids = 10,110.0 cf Stone Storage

Chamber Storage + Stone Storage = 25,040.5 cf = 0.575 af Overall Storage Efficiency = 62.3% Overall System Size = 181.62' x 63.25' x 3.50'

325 Chambers 1,489.1 cy Field 936.1 cy Stone





Pond 10P: Underground Storage w/ Porous Pavement 5

Summary for Pond 11P: Proposed Rain Garden 2 (East)

32,033 sf, 45.19% Impervious, Inflow Depth = 2.19" for 2-Year Current event Inflow Area = Inflow = 1.47 cfs @ 12.22 hrs, Volume= 5.859 cf 0.36 cfs @ 12.69 hrs, Volume= Outflow = 5,649 cf, Atten= 75%, Lag= 28.5 min 0.20 cfs @ 12.69 hrs, Volume= Primary = 5,263 cf Routed to Pond 12P : Underground Storage w/ Porous Pavement 6 0.17 cfs @ 12.69 hrs, Volume= Secondary = 386 cf Routed to Pond 12P : Underground Storage w/ Porous Pavement 6

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.18' @ 12.69 hrs Surf.Area= 3,045 sf Storage= 3,049 cf

Plug-Flow detention time= 879.1 min calculated for 5,649 cf (96% of inflow) Center-of-Mass det. time= 857.4 min (1,654.1 - 796.6)

| <u>Volume</u> | Invert | Avail. | Storage | age Storage Description | | | | |
|---------------|--------------------|-----------|--|--|--|--|--|--|
| #1 | 98.25' | | 3,267 cf | Custom Stage Data (Conic)Listed below (Recalc) | | | | |
| Elevatio | on Su | rf.Area 🕚 | /oids | Inc.Store | Cum.Store | Wet.Area | | |
| (fee | et) | (sq-ft) | (%) | (cubic-feet) | (cubic-feet) | (sq-ft) | | |
| 98. | 25 | 2,635 | 0.0 | 0 | 0 | 2,635 | | |
| 99.2 | 25 | 2,635 | 35.0 | 922 | 922 | 2,817 | | |
| 99. | 50 | 2,635 | 25.0 | 165 | 1,087 | 2,862 | | |
| 100.0 | 00 | 3,045 | 0.001 | 1,419 | 2,506 | 3,283 | | |
| 100.2 | 25 | 3,045 | 0.00 | 761 | 3,267 | 3,332 | | |
| Device | Routing | Inve | ert Outl | et Devices | | | | |
| #1 | #1 Primary 98.15' | | 5' 4.0'' Inlet n= 0 | 4.0" Round Culvert L= 11.0' Ke= 0.500 Inlet / Outlet Invert= 98.15' / 98.09' S= 0.0055 '/' Cc= 0.900 n= 0.020 Corrugated PE corrugated interior Flow Area= 0.09 sf | | | | |
| #2 | Device 1 | 98.1 | 5' 0.7'' Limi | 0.7" Vert. Restrictive Orifice C= 0.600 Limited to weir flow at low heads | | | | |
| #3 | Device 2 98.25' | | 25' 4.0'' Inlet | 4.0" Round 4" HDPE Underdrain L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 98.25' / 98.15' S= 0.0050 '/' Cc= 0.900 n= 0.020 Corrugated PE corrugated interior Flow Area= 0.09 sf | | | | |
| #4 | #4 Device 3 98.25' | | 25' 0.9 " X 3 | 0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads | | | | |
| #5 | Device 1 | 100.0 | 0' 4.0'' Limi | 4.0" Horiz. Draintech Atrium C= 0.600 | | | | |
| #6 | Secondary | 100.1 | 0' 3.0' Hea 2.50 Coe 2.85 | long x 2.0' bread d (feet) 0.20 0.40 3.00 3.50 f. (English) 2.54 5 3.07 3.20 3.32 | Broad-Crested 0.60 0.80 1.00 2.61 2.61 2.60 2. | Rectangular Weir1.201.401.601.802.00662.702.772.892.88 | | |

| Site1HillsboroughMunicpComplex_20240628VOAA 24-hr C 2-Year_ | _Current Rainfall=3.34" |
|---|-------------------------|
| Prepared by Rutgers Cooperative Extension Water Resources Program | Printed 6/29/2024 |
| HydroCAD® 10.10-7c s/n 03601 © 2022 HydroCAD Software Solutions LLC | Page 127 |

Primary OutFlow Max=0.20 cfs @ 12.69 hrs HW=100.18' (Free Discharge) 1=Culvert (Passes 0.20 cfs of 0.41 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.02 cfs @ 6.81 fps) 3=4" HDPE Underdrain (Passes 0.02 cfs of 0.32 cfs potential flow) 4=Perforations (Passes 0.02 cfs of 5.01 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.18 cfs @ 2.03 fps)

Secondary OutFlow Max=0.17 cfs @ 12.69 hrs HW=100.18' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 0.17 cfs @ 0.71 fps)



Pond 11P: Proposed Rain Garden 2 (East)

Summary for Pond 12P: Underground Storage w/ Porous Pavement 6

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 32,033 sf, 45.19% Impervious, | Inflow Depth > 2.12" for 2-Year _Current event |
|---------------|-------------------------------|--|
| Inflow = | 0.36 cfs @ 12.69 hrs, Volume= | 5,649 cf |
| Outflow = | 0.01 cfs @ 51.56 hrs, Volume= | 3,111 cf, Atten= 96%, Lag= 2,332.1 min |
| Primary = | 0.01 cfs @ 51.56 hrs, Volume= | 3,111 cf |
| Secondary = | 0.00 cfs @ 0.00 hrs, Volume= | 0 cf |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 96.50' @ 51.56 hrs Surf.Area= 8,364 sf Storage= 2,789 cf

Plug-Flow detention time= 1,546.7 min calculated for 3,109 cf (55% of inflow) Center-of-Mass det. time= 777.5 min (2,431.6 - 1,654.1)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|---|
| #1 | 96.17' | 1,866 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 4,603 cf | 25.25'W x 202.98'L x 3.50'H Field A |
| | | | 17,938 cf Overall - 6,432 cf Embedded = 11,506 cf x 40.0% Voids |
| #3A | 96.17' | 6,432 cf | ADS_StormTech SC-740 +Cap x 140 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 140 Chambers in 5 Rows |
| | | 12 000 of | Total Available Storage |

12,900 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevation (feet) | | Surf.Area (sq-ft) | Void %) | ds Inc.Store 6) (cubic-feet) | Cum.Store (cubic-feet) | | | |
|---------------------|----------|----------------------|------------|---|---------------------------|-----------------------------|--|--|
| 96.1 | 17 | 3,239 | 0. | .0 0 | 0 | | | |
| 97.6 | 67 | 3,239 | 35. | .0 1,700 | 1,700 | | | |
| 97.8 | 33 | 3,239 | 15. | .0 78 | 1,778 | | | |
| 98.0 | 01 | 3,239 | 15. | .0 87 | 1,866 | | | |
| Device | Routing | In | vert | Outlet Devices | | | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restriction Orifice C= 0.600 | | | | |
| | | | | Limited to weir flow at low heads | | | | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 | | | | |
| | | | | Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 '/' Cc= 0.900 | | | | |
| | | | | n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf | | | | |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. Perforations X 400.00 columns | | | | |
| | | | | X 3 rows C= 0.600 Limited to weir flow at low heads | | | | |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' breadth Broad-Crested Rectangular Weir | | | | |
| | | | | Head (feet) 0.20 0 | 0.40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 | | |
| | | | | 2.50 3.00 3.50 | | | | |
| | | | | Coet. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 | | |
| | | | | 2.85 3.07 3.20 3.3 | 32 | | | |

Primary OutFlow Max=0.01 cfs @ 51.56 hrs HW=96.50' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.01 cfs @ 10.11 fps) 2=6" HDPE Underdrain (Passes 0.01 cfs of 0.40 cfs potential flow) -3=Perforations (Passes 0.01 cfs of 7.51 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 12P: Underground Storage w/ Porous Pavement 6 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

28 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 200.98' Row Length +12.0" End Stone x 2 = 202.98' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

140 Chambers x 45.9 cf = 6,431.6 cf Chamber Storage

17,938.1 cf Field - 6,431.6 cf Chambers = 11,506.5 cf Stone x 40.0% Voids = 4,602.6 cf Stone Storage

Chamber Storage + Stone Storage = 11,034.2 cf = 0.253 af Overall Storage Efficiency = 61.5% Overall System Size = 202.98' x 25.25' x 3.50'

140 Chambers 664.4 cy Field 426.2 cy Stone





Summary for Link 1L: Offsite Flows

| Inflow A | Area = | 927,363 sf, | 3.35% Impervious, | Inflow Depth = 1.19" | for 2-Year _Current event |
|----------|--------|-------------|--------------------|----------------------|---------------------------|
| Inflow | = | 17.10 cfs @ | 12.33 hrs, Volume= | 92,008 cf | |
| Primar | y = | 17.10 cfs @ | 12.33 hrs, Volume= | 92,008 cf, Atte | en= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 1L: Offsite Flows



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| Subcatchment1S: DA1: CN w/ IC | Runoff Area=56,173 sf 73.47% Impervious Runoff Depth=5.31" Flow Length=361' Tc=14.3 min CN=75/98 Runoff=5.91 cfs 24,837 cf |
|-------------------------------------|---|
| Subcatchment 1Sa: Existing RG 1_W | est_ Runoff Area=22,637 sf 64.43% Impervious Runoff Depth=5.15" Flow Length=361' Tc=14.3 min CN=77/98 Runoff=2.34 cfs 9,716 cf |
| Subcatchment1Sb: DA1: CN w/ IC | Runoff Area=39,105 sf 68.25% Impervious Runoff Depth=5.17" Flow Length=361' Tc=14.3 min CN=75/98 Runoff=4.04 cfs 16,863 cf |
| Subcatchment 2S: DA 2: CN w/ IC are | as Runoff Area=58,249 sf 86.46% Impervious Runoff Depth=5.65" Flow Length=391' Tc=7.0 min CN=76/98 Runoff=8.07 cfs 27,403 cf |
| Subcatchment3S: DA 3: CN w/ IC | Runoff Area=158,623 sf 63.48% Impervious Runoff Depth=5.09" Flow Length=441' Tc=8.3 min CN=76/98 Runoff=19.58 cfs 67,305 cf |
| Subcatchment 3Sa: Existing RG 2 Fro | ont DA Runoff Area=25,889 sf 48.62% Impervious Runoff Depth=4.89" Tc=8.3 min CN=79/98 Runoff=3.14 cfs 10,551 cf |
| Subcatchment3Sb: RG 1 DA | Runoff Area=21,388 sf 65.14% Impervious Runoff Depth=5.06" Flow Length=441' Tc=8.3 min CN=74/98 Runoff=2.62 cfs 9,022 cf |
| Subcatchment3Sc: DA 3: CN w/ IC ar | reas Runoff Area=111,346 sf 66.62% Impervious Runoff Depth=5.13" Flow Length=441' Tc=8.3 min CN=75/98 Runoff=13.79 cfs 47,636 cf |
| Subcatchment4S: DA 4: CN w/ IC | Runoff Area=86,816 sf 90.62% Impervious Runoff Depth=5.74" Flow Length=143' Tc=8.4 min CN=75/98 Runoff=11.62 cfs 41,499 cf |
| Subcatchment4Sa: RG 4 DA | Runoff Area=24,369 sf 57.53% Impervious Runoff Depth=5.08" Flow Length=143' Tc=8.4 min CN=79/98 Runoff=3.01 cfs 10,312 cf |
| Subcatchment4Sb: DA 4: CN w/ IC ar | reas Runoff Area=72,797 sf 88.81% Impervious Runoff Depth=5.69" Flow Length=143' Tc=8.4 min CN=75/98 Runoff=9.69 cfs 34,522 cf |
| Subcatchment 5S: DA 5: CN w/ IC | Runoff Area=78,058 sf 72.85% Impervious Runoff Depth=5.34" Flow Length=310' Tc=11.5 min CN=77/98 Runoff=8.96 cfs 34,767 cf |
| Subcatchment 5Sa: RG 3 DA | Runoff Area=19,898 sf 48.83% Impervious Runoff Depth=4.90" Flow Length=310' Tc=11.5 min CN=79/98 Runoff=2.16 cfs 8,117 cf |
| Subcatchment 5Sb: DA 5: CN w/ IC ar | reas Runoff Area=58,163 sf 81.07% Impervious Runoff Depth=5.50" Flow Length=310' Tc=11.5 min CN=75/98 Runoff=6.79 cfs 26,641 cf |
| Subcatchment6S: DA 6: CN w/ IC are | as Runoff Area=32,033 sf 45.19% Impervious Runoff Depth=4.82" Flow Length=276' Tc=14.0 min CN=79/98 Runoff=3.22 cfs 12,863 cf |
| Subcatchment 7S: DA 7 (Offsite Sout | h): Runoff Area=107,001 sf 18.84% Impervious Runoff Depth=4.18" Flow Length=309' Tc=14.5 min CN=78/98 Runoff=9.51 cfs 37,278 cf |

Subcatchment 8S: DA 8 (Offsite North): CN Runoff Area=340,642 sf 1.94% Impervious Runoff Depth=3.41" Flow Length=976' Tc=19.4 min CN=74/98 Runoff=22.69 cfs 96,880 cf Runoff Area=479,720 sf 0.89% Impervious Runoff Depth=3.29" Subcatchment9S: DA 9 (Offsite Field Flow Length=1,468' Tc=30.4 min CN=73/98 Runoff=24.78 cfs 131,435 cf Subcatchment 31S: RG 2 DA Runoff Area=32,035 sf 32.46% Impervious Runoff Depth=4.55" Flow Length=276' Tc=14.0 min CN=79/98 Runoff=3.09 cfs 12,148 cf Avg. Flow Depth=0.27' Max Vel=2.30 fps Inflow=2.34 cfs 9,716 cf Reach 1R: Existing Bioswale West 1 n=0.035 L=33.0' S=0.0227 '/' Capacity=7.36 cfs Outflow=2.32 cfs 9,716 cf Avg. Flow Depth=0.37' Max Vel=2.73 fps Inflow=2.16 cfs 8,117 cf Reach 2R: Bioswale E 1 RG 3 n=0.035 L=35.0' S=0.0286 '/' Capacity=4.02 cfs Outflow=2.15 cfs 8,117 cf Pond 1P: Exising Rain Garden 1 West Peak Elev=100.51' Storage=1,831 cf Inflow=2.32 cfs 9,716 cf Primary=0.31 cfs 5,683 cf Secondary=2.05 cfs 3,854 cf Outflow=2.36 cfs 9,537 cf Pond 2P: Underground Storage w/ Porous Peak Elev=98.09' Storage=19,488 cf Inflow=6.36 cfs 26,400 cf Primary=0.02 cfs 3,880 cf Secondary=0.22 cfs 5,047 cf Outflow=0.24 cfs 8,927 cf Pond 3P: Underground Storage w/ Porous Peak Elev=98.07' Storage=23,297 cf Inflow=8.07 cfs 27,403 cf Primary=0.02 cfs 3,898 cf Secondary=0.14 cfs 3,219 cf Outflow=0.16 cfs 7,117 cf Pond 4P: Existing Rain Garden 2 Front Peak Elev=101.70' Storage=3,267 cf Inflow=3.14 cfs 10,551 cf Primary=0.36 cfs 5,772 cf Secondary=3.65 cfs 3,638 cf Outflow=4.01 cfs 9,410 cf Pond 5P: Proposed Rain Garden 1 (South Peak Elev=101.59' Storage=2,466 cf Inflow=2.62 cfs 9,022 cf Primary=0.33 cfs 5,316 cf Secondary=2.65 cfs 3,148 cf Outflow=2.98 cfs 8,463 cf Pond 6P: Underground Storage w/ Porous Peak Elev=98.11' Storage=56,393 cf Inflow=18.61 cfs 65,510 cf Primary=0.02 cfs 3,902 cf Secondary=0.27 cfs 7,345 cf Outflow=0.28 cfs 11,247 cf Pond 7P: Proposed Rain Garden 4 (North) Peak Elev=100.60' Storage=2,453 cf Inflow=3.01 cfs 10,312 cf Primary=0.34 cfs 5,806 cf Secondary=2.78 cfs 4,231 cf Outflow=3.12 cfs 10,037 cf Pond 8P: Underground Storage w/ Porous Peak Elev=98.08' Storage=38,983 cf Inflow=12.81 cfs 44,559 cf Primary=0.02 cfs 3,908 cf Secondary=0.17 cfs 3,750 cf Outflow=0.18 cfs 7,658 cf Pond 9P: Proposed Rain Garden 3 (North Peak Elev=100.50' Storage=1,751 cf Inflow=2.15 cfs 8,117 cf Primary=0.31 cfs 5,026 cf Secondary=1.94 cfs 2,952 cf Outflow=2.25 cfs 7,978 cf Pond 10P: Underground Storage w/ Porous Peak Elev=98.08' Storage=28,659 cf Inflow=8.75 cfs 34,619 cf Primary=0.02 cfs 3,905 cf Secondary=0.17 cfs 4,034 cf Outflow=0.19 cfs 7,939 cf Pond 11P: Proposed Rain Garden 2 (East) Peak Elev=100.70' Storage=3,267 cf Inflow=3.22 cfs 12,863 cf Primary=0.37 cfs 7,625 cf Secondary=3.66 cfs 5.010 cf Outflow=4.03 cfs 12,635 cf Pond 12P: Underground Storage w/ Porous Peak Elev=97.83' Storage=9,407 cf Inflow=4.03 cfs 12.635 cf Primary=0.02 cfs 3,624 cf Secondary=0.00 cfs 0 cf Outflow=0.02 cfs 3,624 cf

Link 1L: Offsite Flows

Inflow=52.18 cfs 265,592 cf Primary=52.18 cfs 265,592 cf

Total Runoff Area = 1,824,942 sf Runoff Volume = 659,796 cf Average Runoff Depth = 4.34" 63.76% Pervious = 1,163,653 sf 36.24% Impervious = 661,289 sf

Summary for Subcatchment 1S: DA1: CN w/ IC areas_original

Runoff = 5.91 cfs @ 12.22 hrs, Volume= 24,837 cf, Depth= 5.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| | A | rea (sf) | CN | Description | | |
|---|-------------|------------------|-----------------|--------------------------|-------------------|--|
| * | | 2,053 | 79 | Open space | e (fair) C | |
| * | | 12,848 | 74 | Open space | e (good) C | |
| * | | 41,272 | 98 | Impervious | , | |
| | | 56,173 | 92 | Weighted A | verage | |
| | | 14,901 | 75 | 26.53% Pei | vious Area | |
| | | 41,272 | 98 | 73.47% Imp | pervious Are | ea |
| | Tc (min) | Length (feet) | Slope (ft/ft | e Velocity) (ft/sec) | Capacity (cfs) | Description |
| | 12.2 | 100 | 0.0109 | 0.14 | | Sheet Flow, Sheet flow Grass: Short n= 0.150 P2= 3.34" |
| | 0.2 | 33 | 0.0280 | 2.69 | | Shallow Concentrated Flow, SCF - unpaved Unpaved Kv= 16.1 fps |
| | 1.9 | 228 | 0.0095 | 5 1.98 | | Shallow Concentrated Flow, SCF - Paved parking lot Paved Kv= 20.3 fps |
| | 14.3 | 361 | Total | | | |

Subcatchment 1S: DA1: CN w/ IC areas_original



Summary for Subcatchment 1Sa: Existing RG 1_West_ DA

Runoff = 2.34 cfs @ 12.22 hrs, Volume= Routed to Reach 1R : Existing Bioswale West 1 9,716 cf, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| | A | rea (sf) | CN | Description | | | | | |
|---|-------------|------------------|------------------|---|-------------------|--|--|--|--|
| * | | 5,569 | 79 | Open space (fair) C - Portion from DA 9 the field | | | | | |
| * | | 14,584 | 98 | Impervious | Parking Lo | t | | | |
| * | | 2,484 | 74 | OPen Spac | e (Good) C | - Portion from DA1 | | | |
| | | 22,637 | 91 | Weighted A | verage | | | | |
| | | 8,053 | 77 | 35.57% Pei | rvious Area | | | | |
| | | 14,584 | 98 | 64.43% Imp | pervious Are | ea | | | |
| | Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description | | | |
| | 12.2 | 100 | 0.0109 | 0.14 | | Sheet Flow, Sheet flow Grass: Short n= 0.150 P2= 3.34" | | | |
| | 0.2 | 33 | 0.0280 | 2.69 | | Shallow Concentrated Flow, SCF - unpaved Unpaved Kv= 16.1 fps | | | |
| | 1.9 | 228 | 0.0095 | 1.98 | | Shallow Concentrated Flow, SCF - Paved parking lot Paved Kv= 20.3 fps | | | |
| | 44.0 | 0.04 | T () | | | | | | |

14.3 361 Total

Subcatchment 1Sa: Existing RG 1_West_ DA



Summary for Subcatchment 1Sb: DA1: CN w/ IC areas_Remaining

Runoff = 4.04 cfs @ 12.22 hrs, Volume= 16,863 cf, Depth= 5.17" Routed to Pond 2P : Underground Storage w/ Porous Pavement 1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| _ | A | rea (sf) | CN | Description | | |
|---|--------------|----------|--------|-------------|-------------|--|
| * | | 2,053 | 79 | Open space | e (fair) C | |
| * | | 10,364 | 74 | Open space | e (good) C | |
| * | | 26,688 | 98 | Impervious | (0) | |
| _ | | 39,105 | 91 | Weighted A | verage | |
| | | 12,417 | 75 | 31.75% Pei | rvious Area | |
| | | 26,688 | 98 | 68.25% Imp | pervious Ar | ea |
| | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description |
| | <u>(min)</u> | (feet) | (ft/ft |) (ft/sec) | (cfs) | |
| | 12.2 | 100 | 0.0109 | 9 0.14 | | Sheet Flow, Sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 0.2 | 33 | 0.0280 |) 2.69 | | Shallow Concentrated Flow, SCF - unpaved |
| | | | | | | Unpaved Kv= 16.1 fps |
| | 1.9 | 228 | 0.0095 | 5 1.98 | | Shallow Concentrated Flow, SCF - Paved parking lot |
| _ | | | | | | Paved Kv= 20.3 fps |
| | 14.3 | 361 | Total | | | |

Subcatchment 1Sb: DA1: CN w/ IC areas_Remaining



Summary for Subcatchment 2S: DA 2: CN w/ IC areas

Runoff = 8.07 cfs @ 12.14 hrs, Volume= 27,403 cf, Depth= 5.65" Routed to Pond 3P : Underground Storage w/ Porous Pavement 2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| | A | rea (sf) | CN | Description | | |
|---|-------|----------|--------|-------------|--------------|--|
| * | | 3,767 | 79 | Open space | e (Fair) C | |
| * | | 4,118 | 74 | Open Spac | e (good) C | |
| * | | 50,364 | 98 | Impervious | , | |
| | | 58,249 | 95 | Weighted A | verage | |
| | | 7,885 | 76 | 13.54% Pe | rvious Area | |
| | | 50,364 | 98 | 86.46% Imp | pervious Are | ea |
| | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description |
| _ | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | |
| | 4.8 | 18 | 0.0037 | 7 0.06 | | Sheet Flow, Sheet flow - grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 2.2 | 373 | 0.0186 | 6 2.77 | | Shallow Concentrated Flow, SCF _ paved |
| | | | | | | Paved Kv= 20.3 fps |
| | 7.0 | 391 | Total | | | |

Subcatchment 2S: DA 2: CN w/ IC areas



Summary for Subcatchment 3S: DA 3: CN w/ IC areas_Original

Runoff = 19.58 cfs @ 12.15 hrs, Volume= 67,305 cf, Depth= 5.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| _ | A | rea (sf) | CN | Description | | | |
|---------|-----------|----------|------------|----------------------|------------|--|--|
| * | | 18,715 | 79 | Open space | e (Fair) C | | |
| * | | 39,208 | 74 | Open space | e (good) C | | |
| * | 1 | 00,700 | 98 | Impervious | (0) | | |
| _ | 158.623 9 | | 90 | Weighted Average | | | |
| | 57,923 | | 76 | 36.52% Pervious Area | | | |
| 100,700 | | 98 | 63.48% Imp | pervious Ar | ea | | |
| | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | |
| _ | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | |
| | 5.8 | 83 | 0.0489 | 0.24 | | Sheet Flow, sheet flow - grass | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | |
| | 2.5 | 358 | 0.0138 | 3 2.38 | | Shallow Concentrated Flow, SCF - paved | |
| | | | | | | Paved Kv= 20.3 fps | |
| _ | 8.3 | 441 | Total | | | | |

Subcatchment 3S: DA 3: CN w/ IC areas_Original



Summary for Subcatchment 3Sa: Existing RG 2 Front DA

Runoff = 3.14 cfs @ 12.15 hrs, Volume= 10,551 cf, Depth= 4.89" Routed to Pond 4P : Existing Rain Garden 2 Front

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| 0 | | | Dive et Fretre | | | | | |
|----------------------------|------------------------|-------------------------------|---------------------------------|--|--|--|--|--|
| (mi | in) (feet) | (ft/ | t/ft) (ft/sec) (cfs) | | | | | |
| | ro congui | 0101 | | | | | | |
| - | To Length | Slor | e Velocity Capacity Description | | | | | |
| | 12,007 | | | | | | | |
| | 48.62% Impervious Area | | | | | | | |
| | 13,302 | 3.302 79 51.38% Pervious Area | | | | | | |
| 25,889 88 Weighted Average | | | | | | | | |
| | 05,000 | 00 | | | | | | |
| | 13.302 | 79 | 50-75% Grass cover. Fair. HSG C | | | | | |
| * | 5,114 | 98 | Impervious Sidewalk | | | | | |
| _ | 900 | 98 | Glaver Surface, nog C - Path | | | | | |
| * | 066 | 00 | | | | | | |
| * | 6 507 | 98 | Impervious Roof Top | | | | | |
| - | Area (sf) | CN | Description | | | | | |



Direct Entry,

Subcatchment 3Sa: Existing RG 2 Front DA



Summary for Subcatchment 3Sb: RG 1 DA

Runoff = 2.62 cfs @ 12.15 hrs, Volume= 9,022 cf, Depth= 5.06" Routed to Pond 5P : Proposed Rain Garden 1 (South West)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| _ | A | rea (sf) | CN | Description | | | | |
|---------------------------------|-------|----------|--------|-------------|----------------------|--|--|--|
| * | | 7,455 | 74 | Open space | Dpen space (good) C | | | |
| * | | 10,303 | 98 | Impervious | mpervious - Roof top | | | |
| * | | 3,630 | 98 | Impervious | - Road / Si | dewalk | | |
| | | 21,388 | 90 | Weighted A | verage | | | |
| | | 7,455 | 74 | 34.86% Pe | rvious Area | | | |
| 13,933 98 65.14% Impervious Are | | | | 65.14% Im | pervious Ar | ea | | |
| | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | |
| | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | | |
| | 5.8 | 83 | 0.048 | 9 0.24 | | Sheet Flow, sheet flow - grass | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | |
| | 2.5 | 358 | 0.0138 | 3 2.38 | | Shallow Concentrated Flow, SCF - paved | | |
| | | | | | | Paved Kv= 20.3 fps | | |
| | 8.3 | 441 | Total | | | | | |

Subcatchment 3Sb: RG 1 DA



Summary for Subcatchment 3Sc: DA 3: CN w/ IC areas Remaining

Runoff 13.79 cfs @ 12.15 hrs, Volume= 47,636 cf, Depth= 5.13" = Routed to Pond 6P : Underground Storage w/ Porous Pavement 3

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year 2100 Rainfall=6.21"

| | A | rea (sf) | CN | Description | | | | |
|---|---------------------------------|----------|-------------|----------------------|---------------------|--|--|--|
| * | | 5,413 | 79 | Open space | Open space (Fair) C | | | |
| * | | 31,753 | 74 | Open space | e (good) C | | | |
| * | | 74,180 | 98 | Impervious | (0) | | | |
| | 1 | 11,346 | 90 | Weighted A | verage | | | |
| | 37,166 | | 75 | 33.38% Pervious Area | | | | |
| | 74,180 98 66.62% Impervious Are | | pervious Ar | ea | | | | |
| | | | | - | | | | |
| | Tc | Length | Slope | e Velocity | Capacity | Description | | |
| | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | | |
| | 5.8 | 83 | 0.048 | 9 0.24 | | Sheet Flow, sheet flow - grass | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | |
| | 2.5 | 358 | 0.013 | 8 2.38 | | Shallow Concentrated Flow, SCF - paved | | |
| | | | | | | Paved Kv= 20.3 fps | | |
| | 8.3 | 441 | Total | | | | | |

Subcatchment 3Sc: DA 3: CN w/ IC areas Remaining



Hydrograph

Summary for Subcatchment 4S: DA 4: CN w/ IC areas_original

Runoff = 11.62 cfs @ 12.15 hrs, Volume= 41,499 cf, Depth= 5.74"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| | A | rea (sf) | CN | Description | | | |
|---|------------------------------|----------|---------------------------|---------------------|------------|--|--|
| * | | 1,403 | 79 | Open space (fair) C | | | |
| * | | 446 | 84 | Open space (fair) D | | | |
| * | | 6,298 | 74 | Open space | e (good) C | | |
| * | | 78,669 | 98 | Impervious | | | |
| | | 86,816 | 96 | Weighted A | verage | | |
| | 8,147 75 9.38% Pervious Area | | | 9.38% Perv | ious Area | | |
| | | 78,669 | 9 98 90.62% Impervious Ar | | | ea | |
| | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | |
| _ | (min) | (feet) | (ft/ft | :) (ft/sec) | (cfs) | | |
| | 7.9 | 67 | 0.0144 | 4 0.14 | | Sheet Flow, sheet flow - grass | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | |
| | 0.5 | 76 | 0.015 | 5 2.53 | | Shallow Concentrated Flow, SCF - Paved | |
| | | | | | | Paved Kv= 20.3 fps | |
| | 8.4 | 143 | Total | | | | |

Subcatchment 4S: DA 4: CN w/ IC areas_original


Summary for Subcatchment 4Sa: RG 4 DA

Runoff = 3.01 cfs @ 12.15 hrs, Volume= 10,312 cf, Depth= 5.08" Routed to Pond 7P : Proposed Rain Garden 4 (North)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| | A | rea (sf) | CN | Description | | | | | | | |
|--|-------|----------|--------------|----------------------------------|-------------|--|--|--|--|--|--|
| * | | 10,350 | 79 | 79 Open space (fair) C from DA 8 | | | | | | | |
| * | | 14,019 | 98 | Impervious Parkinglot | | | | | | | |
| 24,369 90 Weighted Average 10.350 79 42.47% Pervious Area | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | 14,019 | 98 | 57.53% Imp | pervious Ar | ea | | | | | |
| | То | Longth | Slond |)/olooity/ | Conocity | Description | | | | | |
| | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | Description | | | | | |
| | 7.9 | 67 | 0.0144 | 1 0.14 | | Sheet Flow, sheet flow - grass | | | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | | | |
| | 0.5 | 76 | 0.0155 | 5 2.53 | | Shallow Concentrated Flow, SCF - Paved | | | | | |
| | | | | | | Paved Kv= 20.3 fps | | | | | |
| | ~ 4 | 4 4 0 | T () | | | | | | | | |

8.4 143 Total

Subcatchment 4Sa: RG 4 DA



Summary for Subcatchment 4Sb: DA 4: CN w/ IC areas

Runoff = 9.69 cfs @ 12.15 hrs, Volume= 34,522 cf, Depth= 5.69" Routed to Pond 8P : Underground Storage w/ Porous Pavement 4

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| | A | rea (sf) | CN | Description | | | | | | |
|---|-------|----------|--------|-------------|---------------------|--|--|--|--|--|
| * | | 1,403 | 79 | Open space | e (fair) C | | | | | |
| * | | 446 | 84 | Open space | Dpen space (fair) D | | | | | |
| * | | 6,298 | 74 | Open space | e (good) C | | | | | |
| * | | 64,650 | 98 | Impervious | | | | | | |
| | | 72,797 | 95 | Weighted A | verage | | | | | |
| | | 8,147 | 75 | 11.19% Pe | rvious Area | | | | | |
| | | 64,650 | 98 | 88.81% Imp | pervious Ar | ea | | | | |
| | | | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | | |
| | (min) | (feet) | (ft/ft | i) (ft/sec) | (cfs) | | | | | |
| | 7.9 | 67 | 0.0144 | 4 0.14 | | Sheet Flow, sheet flow - grass | | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | | |
| | 0.5 | 76 | 0.015 | 5 2.53 | | Shallow Concentrated Flow, SCF - Paved | | | | |
| | | | | | | Paved Kv= 20.3 fps | | | | |
| | 8.4 | 143 | Total | | | | | | | |

Subcatchment 4Sb: DA 4: CN w/ IC areas



Summary for Subcatchment 5S: DA 5: CN w/ IC areas_Original

Runoff = 8.96 cfs @ 12.19 hrs, Volume= 34,767 cf, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| | A | rea (sf) | CN | Description | | |
|--------------------|---------------------|----------|---------|--|--------------|--|
| * | | 11,294 | 79 | Open Spac | | |
| * | | 9,899 | 74 | Open Spac | e (good) C | |
| * | | 56,865 | 98 | Impervious | , | |
| | | 78,058 | 92 | Weighted A | verage | |
| | | 21,193 | 77 | 27.15% Pei | vious Area | |
| | | 56,865 | 98 | 72.85% Imp | pervious Are | ea |
| | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description |
| _ | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | |
| | 8.7 | 64 | 0.0105 | 0.12 | | Sheet Flow, Sheet flow -grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 1.3 179 0.0129 2.31 | | | Shallow Concentrated Flow, SCF - paved | | |
| | | | | | | Paved Kv= 20.3 fps |
| 1.5 67 0.0120 0.77 | | | | 0.77 | | Shallow Concentrated Flow, SCF _ grass |
| _ | | | | | | Short Grass Pasture Kv= 7.0 fps |
| | 11.5 | 310 | Total | | | |

Subcatchment 5S: DA 5: CN w/ IC areas_Original



Summary for Subcatchment 5Sa: RG 3 DA

Runoff = 2.16 cfs @ 12.19 hrs, Volume= 8,117 cf, Depth= 4.90" Routed to Reach 2R : Bioswale E 1 RG 3

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| | A | rea (sf) | CN | Description | | |
|---|---------------------|----------|--------|--|-------------|--|
| * | | 10,182 | 79 | Open Spac | e (Fair) C | |
| * | | 9,716 | 98 | Impervious | Parking lot | |
| | | 19,898 | 88 | Weighted A | verage | |
| | | 10,182 | 79 | 51.17% Pei | rvious Area | |
| | | 9,716 | 98 | 48.83% Imp | pervious Ar | ea |
| | | | | | | |
| | Tc | Length | Slope | e Velocity | Capacity | Description |
| _ | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | |
| | 8.7 | 64 | 0.0105 | 5 0.12 | | Sheet Flow, Sheet flow -grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 1.3 179 0.0129 2.31 | | | Shallow Concentrated Flow, SCF - paved | | |
| | | | | | | Paved Kv= 20.3 fps |
| | 1.5 | 67 | 0.0120 | 0.77 | | Shallow Concentrated Flow, SCF _ grass |
| | | | | | | Short Grass Pasture Kv= 7.0 fps |
| | | 0.4.0 | - | | | |

11.5 310 Total

Subcatchment 5Sa: RG 3 DA



Summary for Subcatchment 5Sb: DA 5: CN w/ IC areas

Runoff = 6.79 cfs @ 12.19 hrs, Volume= 26,641 cf, Depth= 5.50" Routed to Pond 10P : Underground Storage w/ Porous Pavement 5

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| | A | rea (sf) | CN [| Description | | |
|---|---------------------------------|----------|---------|-------------|------------|--|
| * | | 1,112 | 79 (| Open Spac | e (Fair) C | |
| * | | 9,899 | 74 (| Open Spac | e (good) C | |
| * | | 47,152 | 98 I | mpervious | , | |
| | 58.163 94 Weighted Average | | | | | |
| | 11,011 75 18.93% Pervious Area | | | | | |
| | 47,152 98 81.07% Impervious Are | | | | | ea |
| | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description |
| _ | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | |
| | 8.7 | 64 | 0.0105 | 0.12 | | Sheet Flow, Sheet flow -grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 1.3 | 179 | 0.0129 | 2.31 | | Shallow Concentrated Flow, SCF - paved |
| | | | | | | Paved Kv= 20.3 fps |
| | 1.5 | 67 | 0.0120 | 0.77 | | Shallow Concentrated Flow, SCF _ grass |
| | | | | | | Short Grass Pasture Kv= 7.0 fps |

11.5 310 Total

Subcatchment 5Sb: DA 5: CN w/ IC areas



Summary for Subcatchment 6S: DA 6: CN w/ IC areas

Runoff = 3.22 cfs @ 12.22 hrs, Volume= 12,863 cf, Depth= 4.82" Routed to Pond 11P : Proposed Rain Garden 2 (East)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| | A | rea (sf) | CN | Description | | |
|---|-------|----------|---------|-------------|--------------|--|
| * | | 16,559 | 79 | Open Spac | e (fair) C | |
| * | | 998 | 74 | Open Spac | e (good) C | |
| * | | 14,476 | 98 | mpervious | | |
| | | 32,033 | 87 | Neighted A | verage | |
| | | 17,557 | 79 | 54.81% Pei | vious Area | |
| | | 14,476 | 98 4 | 45.19% Imp | pervious Are | ea |
| | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | |
| | 12.8 | 100 | 0.0098 | 0.13 | | Sheet Flow, Sheet flow - grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 0.5 | 86 | 0.0244 | 3.17 | | Shallow Concentrated Flow, SCF - paved |
| | | | | | | Paved Kv= 20.3 fps |
| | 0.7 | 90 | 0.0178 | 2.15 | | Shallow Concentrated Flow, SCF - unpaved |
| | | | | | | Unpaved Kv= 16.1 fps |

14.0 276 Total

Subcatchment 6S: DA 6: CN w/ IC areas



Summary for Subcatchment 7S: DA 7 (Offsite South): CN w/ IC areas

Runoff = 9.51 cfs @ 12.23 hrs, Volume= 37,278 Routed to Link 1L : Offsite Flows

37,278 cf, Depth= 4.18"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| | A | rea (sf) | CN [| Description | | |
|---|-------|----------|--------------|-------------|-------------|--|
| * | | 70,444 | 79 (| Open Spac | e (fair) C | |
| * | | 16,401 | 74 (| Dpen Spac | e (good) C | |
| * | | 20,156 | 98 I | mpervious | | |
| | 1 | 07,001 | 82 V | Veighted A | verage | |
| | | 86,845 | 78 8 | 81.16% Per | vious Area | |
| | | 20,156 | 98 1 | 8.84% Imp | pervious Ar | ea |
| | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | |
| | 12.1 | 100 | 0.0112 | 0.14 | | Sheet Flow, Sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 2.2 | 165 | 0.0305 | 1.22 | | Shallow Concentrated Flow, SCF _ grass |
| | | | | | | Short Grass Pasture Kv= 7.0 fps |
| | 0.2 | 44 | 0.0317 | 3.61 | | Shallow Concentrated Flow, SCF _ paved |
| | | | | | | Paved Kv= 20.3 fps |
| | | ~~~ | — · · | | | |

14.5 309 Total

Subcatchment 7S: DA 7 (Offsite South): CN w/ IC areas



Summary for Subcatchment 8S: DA 8 (Offsite North): CN w/ IC areas

Runoff = 22.69 cfs @ 12.29 hrs, Volume= Routed to Link 1L : Offsite Flows 96,880 cf, Depth= 3.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| _ | A | rea (sf) | CN | Description | 1 I I I I I I I I I I I I I I I I I I I | |
|----|------|----------|-------|--------------|---|---|
| * | | 2,767 | 70 | Brush (fair) | C | |
| * | | 63,031 | 77 | Brush (fair) | D | |
| * | | 86,643 | 65 | Brush (goo | d) C | |
| * | | 64,708 | 73 | Brush (goo | d) D | |
| * | | 73,083 | 79 | Open spac | e (Fair) C | |
| * | | 30,261 | 84 | Open spac | e (fair) D | |
| * | | 4,460 | 74 | Open spac | e (good) C | |
| * | | 9,087 | 80 | Open spac | e (good) D | |
| * | | 6,602 | 98 | Impervious | i | |
| | 3 | 340,642 | 75 | Weighted A | Average | |
| | 3 | 334,040 | 74 | 98.06% Pe | rvious Area | |
| | | 6,602 | 98 | 1.94% Imp | ervious Area | а |
| | | | | | | |
| | Тс | Length | Slop | e Velocity | Capacity | Description |
| _(| min) | (feet) | (ft/f | t) (ft/sec) | (cfs) | |
| | 7.5 | 100 | 0.036 | 6 0.22 | | Sheet Flow, sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 11.9 | 876 | 0.006 | 7 1.23 | | Shallow Concentrated Flow, scf - grass waterway |
| | | | | | | Grassed Waterway Kv= 15.0 fps |
| | 19.4 | 976 | Total | | | |



Subcatchment 8S: DA 8 (Offsite North): CN w/ IC areas

Summary for Subcatchment 9S: DA 9 (Offsite Field West): CN w/ IC areas

Runoff = 24.78 cfs @ 12.43 hrs, Volume= 131,435 cf, Depth= 3.29" Routed to Link 1L : Offsite Flows

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| _ | A | rea (sf) | CN | Description | | |
|---|---------------------|----------|---------|--|---------------------------------|---|
| * | | 72,478 | 65 | Brush (good | d) C | |
| * | | 10,448 | 79 | Open spcae | e (fair) C | |
| * | 3 | 92,515 | 74 | Open Spac | e (good) C | |
| * | | 4,279 | 98 | Impervious | | |
| | 4 | 79,720 | 73 | Weighted A | verage | |
| | 4 | 75,441 | 73 | 99.11% Pei | vious Area | |
| | | 4,279 | 98 | 0.89% Impe | ervious Area | а |
| | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | |
| | 10.5 | 100 | 0.0159 | 0.16 | | Sheet Flow, Sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 7.1 362 0.0148 0.85 | | | Shallow Concentrated Flow, SCF - grass | | |
| | | | | | Short Grass Pasture Kv= 7.0 fps | |
| | 12.8 | 1,006 | 0.0076 | 1.31 | | Shallow Concentrated Flow, SCF - grass waterway |
| | | | | | | Grassed Waterway Kv= 15.0 fps |
| | 30.4 | 1.468 | Total | | | |

Subcatchment 9S: DA 9 (Offsite Field West): CN w/ IC areas



Summary for Subcatchment 31S: RG 2 DA

Runoff = 3.09 cfs @ 12.22 hrs, Volume= 12,148 cf, Depth= 4.55"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

| | A | rea (sf) | CN | Description | | | | | |
|---|-------------|------------------|-----------------|--------------------------|---------------------|---|--|--|--|
| * | | 21,638 | 79 | Open Spac | e (fair) C | | | | |
| * | | 10,397 | 98 | Impervious | · · · | | | | |
| | | 32,035 | 85 | Weighted A | verage | | | | |
| | | 21,638 | 79 | 67.54% Pei | 7.54% Pervious Area | | | | |
| | | 10,397 | 98 | 32.46% Imp | pervious Ar | ea | | | |
| (| Tc (min) | Length (feet) | Slope (ft/ft | e Velocity) (ft/sec) | Capacity (cfs) | Description | | | |
| | 12.8 | 100 | 0.0098 | 3 0.13 | | Sheet Flow, Sheet flow - grass Grass: Short n= 0.150 P2= 3.34" | | | |
| | 0.5 | 86 | 0.0244 | 4 3.17 | | Shallow Concentrated Flow, SCF - paved Paved Kv= 20.3 fps | | | |
| | 0.7 | 90 | 0.0178 | 3 2.15 | | Shallow Concentrated Flow, SCF - unpaved Unpaved Kv= 16.1 fps | | | |
| | 14.0 | 276 | Total | | | | | | |

Subcatchment 31S: RG 2 DA



Summary for Reach 1R: Existing Bioswale West 1

Inflow Area = 22,637 sf, 64.43% Impervious, Inflow Depth = 5.15" for 10-Year 2100 event Inflow 2.34 cfs @ 12.22 hrs, Volume= 9.716 cf = 2.32 cfs @ 12.23 hrs, Volume= Outflow = 9,716 cf, Atten= 1%, Lag= 0.4 min Routed to Pond 1P : Exising Rain Garden 1 West Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Max. Velocity= 2.30 fps, Min. Travel Time= 0.2 min Avg. Velocity = 0.64 fps, Avg. Travel Time= 0.9 min Peak Storage= 33 cf @ 12.22 hrs Average Depth at Peak Storage= 0.27', Surface Width= 4.60' Bank-Full Depth= 0.50' Flow Area= 2.3 sf, Capacity= 7.36 cfs 3.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds Side Slope Z-value= 3.0 '/' Top Width= 6.00' Length= 33.0' Slope= 0.0227 '/' Inlet Invert= 100.75', Outlet Invert= 100.00' ‡ **Reach 1R: Existing Bioswale West 1** Hydrograph Inflow 2.34 cfs Outflow 2.32 cfs Inflow Area=22,637 sf Avg. Flow Depth=0.27' 2 Max Vel=2.30 fps n=0.035 (cfs) L=33.0' Flow S=0.0227 '/' Capacity=7.36 cfs 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72

Time (hours)

Summary for Reach 2R: Bioswale E 1 RG 3



Time (hours)

Summary for Pond 1P: Exising Rain Garden 1 West

[93] Warning: Storage range exceeded by 0.26'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

[62] Hint: Exceeded Reach 1R OUTLET depth by 0.24' @ 12.25 hrs

Inflow Area = 22,637 sf, 64.43% Impervious, Inflow Depth = 5.15" for 10-Year 2100 event Inflow = 2.32 cfs @ 12.23 hrs, Volume= 9,716 cf 2.36 cfs @ 12.24 hrs, Volume= 0.31 cfs @ 12.24 hrs, Volume= = Outflow 9,537 cf, Atten= 0%, Lag= 0.6 min Primarv = 5.683 cf Routed to Pond 2P : Underground Storage w/ Porous Pavement 1 Secondary = 2.05 cfs @ 12.24 hrs, Volume= 3,854 cf Routed to Pond 2P : Underground Storage w/ Porous Pavement 1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.51' @ 12.24 hrs Surf.Area= 1,750 sf Storage= 1,831 cf

Plug-Flow detention time= 318.8 min calculated for 9,530 cf (98% of inflow) Center-of-Mass det. time= 308.7 min (1,082.3 - 773.6)

| Volume | Invert | Avail.Storage | | age Sto | e Storage Description | | | | |
|--|--------------------------------|---|----------------------------------|--|--|--|--|--|--|
| #1 | 98.25' | | 1,83 | 1 cf Cu | f Custom Stage Data (Conic)Listed below (Recalc) | | | | |
| Elevatio (fee | on Su et) | rf.Area (sq-ft) | Void %) | ls Inc.Store | | Cum.Store (cubic-feet) | Wet.Area (sq-ft) | | |
| 98.2 99.2 99.5 100.0 100.2 | 25 25 50 00 25 | 1,445 1,445 1,445 1,750 1,750 | 0. 35. 25. 100. 100. | 0 0 0 0 0 0 | 0 506 90 798 438 | 0 506 596 1,394 1,831 | 1,445 1,580 1,613 1,927 1,964 | | |
| Device | Routing | In | vert | Outlet D | evices | | | | |
| #1 | Primary | 98 | .15' | 4.0" Round Culvert L= 11.0' Ke= 0.500 Inlet / Outlet Invert= 98.15' / 98.09' S= 0.0055 '/' Cc= 0.9 | | | | | |
| #2 | Device 1 | 98 | .15' | 0.5" Ver | 5" Vert. Restrictive Orifice C= 0.600 nited to weir flow at low heads | | | | |
| #3 | Device 2 | 98 | .25' | 4.0" Ro Inlet / Or n= 0.020 | und 4" HDPI utlet Invert= 9 Corrugated | E Underdrain L= 2 8.25' / 98.15' S= 0 PE, corrugated inte | 0.0' Ke= 0.500 0.0050 '/' Cc= 0.900 erior. Flow Area= 0.09 sf | | |
| #4 | #4 Device 3 98. | | .25' | 0.9" x 0.1" Horiz. Perforations X 400.00 columns | | | | | |
| #5 | #5 Device 1 100.00' 4.0 | | 4.0" Hoi | 4.0" Horiz. Draintech Atrium C= 0.600 | | | | | |
| #6 | Secondary | 100 | .10' | 3.0' long Head (fe 2.50 3.0 Coef. (E 2.85 3.0 | 3 x 2.0' brea eet) 0.20 0.4 00 3.50 nglish) 2.54 07 3.20 3.32 | dth Broad-Crested 0 0.60 0.80 1.00 2.61 2.61 2.60 2. | Rectangular Weir 1.20 1.40 1.60 1.80 2.00 66 2.70 2.77 2.89 2.88 | | |

Primary OutFlow Max=0.31 cfs @ 12.24 hrs HW=100.50' (Free Discharge) 1=Culvert (Passes 0.31 cfs of 0.45 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.35 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.35 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.42 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.30 cfs @ 3.41 fps)

Secondary OutFlow Max=2.00 cfs @ 12.24 hrs HW=100.50' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 2.00 cfs @ 1.66 fps)



Pond 1P: Exising Rain Garden 1 West

Summary for Pond 2P: Underground Storage w/ Porous Pavement 1

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 61,742 sf, 66.85% Impervious | , Inflow Depth > 5.13" for 10-Year _2100 event |
|---------------|-------------------------------|--|
| Inflow = | 6.36 cfs @ 12.23 hrs, Volume= | = 26,400 cf |
| Outflow = | 0.24 cfs @ 15.50 hrs, Volume= | 8,927 cf, Atten= 96%, Lag= 196.1 min |
| Primary = | 0.02 cfs @ 15.50 hrs, Volume= | 3,880 cf |
| Secondary = | 0.22 cfs @ 15.50 hrs, Volume= | 5,047 cf |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 98.09' @ 15.50 hrs Surf.Area= 13,421 sf Storage= 19,488 cf

Plug-Flow detention time= 990.6 min calculated for 8,921 cf (34% of inflow) Center-of-Mass det. time= 743.5 min (1,626.7 - 883.2)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 1,612 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 9,359 cf | 72.75'W x 146.02'L x 3.50'H Field A |
| | | | 37,179 cf Overall - 13,782 cf Embedded = 23,397 cf x 40.0% Voids |
| #3A | 96.17' | 13,782 cf | ADS_StormTech SC-740 +Cap x 300 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 300 Chambers in 15 Rows |
| | | 24 752 of | Total Available Storage |

24,753 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void %) | ls Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | |
|------------------|-----------|----------------------|------------|------------------------------|---------------------------|------------------------------|
| 96.1 | 17 | 2,798 | 0. | .0 0 | 0 | |
| 97.6 | 67 | 2,798 | 35. | .0 1,469 | 1,469 | |
| 97.8 | 33 | 2,798 | 15. | .0 67 | 1,536 | |
| 98.0 |)1 | 2,798 | 15. | .0 76 | 1,612 | |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | on Orifice C= 0. | 600 |
| | | | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | PE Underdrain L | = 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | = 92.17' / 90.37' - S | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. F | Perforations X 40 | 0.00 columns |
| | | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bro | eadth Broad-Cres | ted Rectangular Weir |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | | |
| | | | | Coet. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3.3 | 32 | |

Primary OutFlow Max=0.02 cfs @ 15.50 hrs HW=98.09' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 11.80 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.47 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 8.79 cfs potential flow)

Secondary OutFlow Max=0.22 cfs @ 15.50 hrs HW=98.09' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 0.22 cfs @ 0.78 fps)

Pond 2P: Underground Storage w/ Porous Pavement 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

20 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 144.02' Row Length +12.0" End Stone x 2 = 146.02' Base Length 15 Rows x 51.0" Wide + 6.0" Spacing x 14 + 12.0" Side Stone x 2 = 72.75' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

300 Chambers x 45.9 cf = 13,782.0 cf Chamber Storage

37,179.5 cf Field - 13,782.0 cf Chambers = 23,397.5 cf Stone x 40.0% Voids = 9,359.0 cf Stone Storage

Chamber Storage + Stone Storage = 23,141.0 cf = 0.531 af Overall Storage Efficiency = 62.2% Overall System Size = 146.02' x 72.75' x 3.50'

300 Chambers 1,377.0 cy Field 866.6 cy Stone





Pond 2P: Underground Storage w/ Porous Pavement 1

Summary for Pond 3P: Underground Storage w/ Porous Pavement 2

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 58,249 sf, 86.46% Impervious, | Inflow Depth = 5.65" for 10-Year _2100 event |
|---------------|-------------------------------|--|
| Inflow = | 8.07 cfs @ 12.14 hrs, Volume= | 27,403 cf |
| Outflow = | 0.16 cfs @ 17.28 hrs, Volume= | 7,117 cf, Atten= 98%, Lag= 308.3 min |
| Primary = | 0.02 cfs @ 17.28 hrs, Volume= | 3,898 cf |
| Secondary = | 0.14 cfs @ 17.28 hrs, Volume= | 3,219 cf |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 98.07' @ 17.28 hrs Surf.Area= 23,296 sf Storage= 23,297 cf

Plug-Flow detention time= 1,242.9 min calculated for 7,112 cf (26% of inflow) Center-of-Mass det. time= 1,020.2 min (1,773.3 - 753.1)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 8,187 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 8,029 cf | 82.25'W x 110.42'L x 3.50'H Field A |
| | | | 31,786 cf Overall - 11,715 cf Embedded = 20,071 cf x 40.0% Voids |
| #3A | 96.17' | 11,715 cf | ADS_StormTech SC-740 +Cap x 255 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 255 Chambers in 17 Rows |
| | | 27.021 of | Total Available Storage |

27,931 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void %) | s Inc.Store b) (cubic-feet) | Cum.Store (cubic-feet) | |
|------------------|-----------|----------------------|------------|--------------------------------|---------------------------|------------------------------|
| 96.1 | 17 | 14,214 | 0. | 0 0 | 0 | |
| 97.6 | 67 | 14,214 | 35. | 0 7,462 | 7,462 | |
| 97.8 | 33 | 14,214 | 15. | 0 341 | 7,803 | |
| 98.0 |)1 | 14,214 | 15. | 0 384 | 8,187 | |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | on Orifice C= 0. | 600 |
| | | | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | PE Underdrain L | = 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | : 92.17' / 90.37' S | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. F | Perforations X 40 | 0.00 columns |
| | - · | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bre | adth Broad-Cres | ted Rectangular Weir |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | | |
| | | | | Coet. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3.3 | 52 | |

Primary OutFlow Max=0.02 cfs @ 17.28 hrs HW=98.07' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 11.77 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.47 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 8.77 cfs potential flow)

Secondary OutFlow Max=0.14 cfs @ 17.28 hrs HW=98.07' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 0.14 cfs @ 0.67 fps)

Pond 3P: Underground Storage w/ Porous Pavement 2 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

15 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 108.42' Row Length +12.0" End Stone x 2 = 110.42' Base Length
17 Rows x 51.0" Wide + 6.0" Spacing x 16 + 12.0" Side Stone x 2 = 82.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

255 Chambers x 45.9 cf = 11,714.7 cf Chamber Storage

31,786.2 cf Field - 11,714.7 cf Chambers = 20,071.5 cf Stone x 40.0% Voids = 8,028.6 cf Stone Storage

Chamber Storage + Stone Storage = 19,743.3 cf = 0.453 af Overall Storage Efficiency = 62.1% Overall System Size = 110.42' x 82.25' x 3.50'

255 Chambers 1,177.3 cy Field 743.4 cy Stone





Pond 3P: Underground Storage w/ Porous Pavement 2

Summary for Pond 4P: Existing Rain Garden 2 Front

[93] Warning: Storage range exceeded by 0.45'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)

25,889 sf, 48.62% Impervious, Inflow Depth = 4.89" for 10-Year 2100 event Inflow Area = 3.14 cfs @ 12.15 hrs, Volume= Inflow = 10,551 cf 4.01 cfs @ 12.20 hrs, Volume= = Outflow 9,410 cf, Atten= 0%, Lag= 2.9 min 0.36 cfs @ 12.20 hrs. Volume= Primarv = 5.772 cf Routed to Pond 6P : Underground Storage w/ Porous Pavement 3 Secondary = 3.65 cfs @ 12.20 hrs, Volume= 3,638 cf Routed to Pond 6P : Underground Storage w/ Porous Pavement 3

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 101.70' @ 12.20 hrs Surf.Area= 3,045 sf Storage= 3,267 cf

Plug-Flow detention time= 435.7 min calculated for 9,404 cf (89% of inflow) Center-of-Mass det. time= 382.5 min (1,159.6 - 777.1)

| Volume | Invert | Avail | I.Stora | age Storage Desci | e Storage Description | |
|---------------------------------|----------------------|---|------------------------------|---|--|---|
| #1 | 99.25' | | 3,26 | 7 cf Custom Stag | e Data (Conic)Listed | l below (Recalc) |
| Elevatio (fee | on Su et) | rf.Area (sq-ft) | Void | s Inc.Store) (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
| 99.2 100.2 100.5 101.0 | 25 25 50 00 | 2,635 2,635 2,635 2,635 3,045 | 0.0 35.0 25.0 100.0 | 0 0 0 922 0 165 0 1,419 | 0 922 1,087 2,506 | 2,635 2,817 2,862 3,283 |
| 101.2 | 25 | 3,045 | 100.0 | 0 761 | 3,267 | 3,332 |
| Device | Routing | ١n | vert | Outlet Devices | | |
| #1 | Primary | 99. | .15' | 4.0" Round Culver Inlet / Outlet Invert= n= 0.020 Corrugate | rt L= 11.0' Ke= 0.5 99.15'/99.09' S= ed PE, corrugated int | 00 0.0055 '/' Cc= 0.900 erior. Flow Area= 0.09 sf |
| #2 | Device 1 | 99. | .15' | 0.5" Vert. Restrictive Orifice C= 0.600 | |) |
| #3 | Device 2 | 99. | .25' | 4.0" Round 4" HD Inlet / Outlet Invert= n= 0.020 Corrugate | PE Underdrain L= 2 99.25' / 99.15' S= 0 ed PE, corrugated int | 20.0' Ke= 0.500 0.0050 '/' Cc= 0.900 erior. Flow Area= 0.09 sf |
| #4 | Device 3 | 99. | .25' | 0.9" x 0.1" Horiz. P X 3 rows C= 0 600 | erforations X 400.0 | 0 columns at low heads |
| #5 | Device 1 | 101. | .00' | 4.0" Horiz. Drainte | ch Atrium C= 0.600 |) |
| #6 | Secondary | 101. | .10' | 3.0' long x 2.0' bre Head (feet) 0.20 0 2.50 3.00 3.50 Coef. (English) 2.5- 2.85 3.07 3.20 3.3 | adth Broad-Crester 40 0.60 0.80 1.00 4 2.61 2.61 2.60 2 | d Rectangular Weir 1.20 1.40 1.60 1.80 2.00 .66 2.70 2.77 2.89 2.88 |

Primary OutFlow Max=0.36 cfs @ 12.20 hrs HW=101.70' (Free Discharge) 1=Culvert (Passes 0.36 cfs of 0.47 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.66 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.37 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.65 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.35 cfs @ 4.03 fps)

Secondary OutFlow Max=3.65 cfs @ 12.20 hrs HW=101.70' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 3.65 cfs @ 2.02 fps)



Pond 4P: Existing Rain Garden 2 Front

Summary for Pond 5P: Proposed Rain Garden 1 (South West)

[93] Warning: Storage range exceeded by 0.34'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)

Inflow Area = 21,388 sf, 65.14% Impervious, Inflow Depth = 5.06" for 10-Year 2100 event 2.62 cfs @ 12.15 hrs. Volume= Inflow = 9,022 cf 2.98 cfs @ 12.15 hrs, Volume= 0.33 cfs @ 12.15 hrs, Volume= = Outflow 8,463 cf, Atten= 0%, Lag= 0.0 min Primarv = 5.316 cf Routed to Pond 6P : Underground Storage w/ Porous Pavement 3 Secondary = 2.65 cfs @ 12.15 hrs, Volume= 3,148 cf Routed to Pond 6P : Underground Storage w/ Porous Pavement 3

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 101.59' @ 12.15 hrs Surf.Area= 2,325 sf Storage= 2,466 cf

Plug-Flow detention time= 430.3 min calculated for 8,463 cf (94% of inflow) Center-of-Mass det. time= 394.4 min (1,161.6 - 767.2)

| Volume | Invert | Avai | il.Stor | age Storage Desc | ription | |
|-------------------------|----------------|-------------------------|---------------------|--|--|---|
| #1 | 99.25' | | 2,46 | 6 cf Custom Stag | e Data (Conic)Liste | ed below (Recalc) |
| Elevatio (fee | on Su et) | rf.Area (sq-ft) | Void (% | ls Inc.Store 6) (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
| 99.2 100.2 | 25 25 | 1,970 1,970 | 0. 35. | 0 0 0 690 | 0 690 | 1,970 2,127 |
| 100.5 101.0 101.2 | 50)0 25 | 1,970 2,325 2,325 | 25. 100. 100. | .0 123 0 1,073 .0 581 | 813 1,885 2,466 | 2,167 2,531 2,574 |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 99 | .15' | 4.0" Round Culve Inlet / Outlet Invert= n= 0.020 Corrugate | rt L= 11.0' Ke= 0. 99.15'/99.09' S= ed PE, corrugated i | .500 = 0.0055 '/' Cc= 0.900 nterior. Flow Area= 0.09 sf |
| #2 | Device 1 | 99 | .15' | 0.5" Vert. Restrict | ve Orifice C= 0.6 at low heads | 00 |
| #3 | Device 2 | 99 | .25' | 4.0" Round 4" HD Inlet / Outlet Invert= n= 0.020 Corrugate | PE Underdrain L= = 99.25' / 99.15' S= ed PE. corrugated i | = 20.0' Ke= 0.500 = 0.0050 '/' Cc= 0.900 nterior. Flow Area= 0.09 sf |
| #4 | Device 3 | 99 | .25' | 0.9" x 0.1" Horiz. F X 3 rows C= 0.600 | Perforations X 400 Limited to weir flow | .00 columns w at low heads |
| #5 | Device 1 | 101 | .00' | 4.0" Horiz. Drainte Limited to weir flow | ch Atrium C= 0.6 at low heads | 00 |
| #6 | Secondary | 101 | .10' | 3.0' long x 2.0' bre Head (feet) 0.20 0 2.50 3.00 3.50 Coef. (English) 2.5 2.85 3.07 3.20 3.3 | eadth Broad-Crest 0.40 0.60 0.80 1.0 4 2.61 2.61 2.60 32 | ed Rectangular Weir 0 1.20 1.40 1.60 1.80 2.00 2.66 2.70 2.77 2.89 2.88 |

Primary OutFlow Max=0.33 cfs @ 12.15 hrs HW=101.58' (Free Discharge) 1=Culvert (Passes 0.33 cfs of 0.46 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.48 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.36 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.52 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.32 cfs @ 3.68 fps)

Secondary OutFlow Max=2.64 cfs @ 12.15 hrs HW=101.58' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 2.64 cfs @ 1.82 fps)



Pond 5P: Proposed Rain Garden 1 (South West)

Summary for Pond 6P: Underground Storage w/ Porous Pavement 3

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 158,623 sf, 63.48% Impervious, | Inflow Depth > 4.96" for 10-Year _2100 event |
|---------------|--------------------------------|--|
| Inflow = | 18.61 cfs @ 12.15 hrs, Volume= | 65,510 cf |
| Outflow = | 0.28 cfs @ 21.42 hrs, Volume= | 11,247 cf, Atten= 98%, Lag= 556.3 min |
| Primary = | 0.02 cfs @ 21.42 hrs, Volume= | 3,902 cf |
| Secondary = | 0.27 cfs @ 21.42 hrs, Volume= | 7,345 cf |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 98.11' @ 21.42 hrs Surf.Area= 38,014 sf Storage= 56,393 cf

Plug-Flow detention time= 1,170.0 min calculated for 11,239 cf (17% of inflow) Center-of-Mass det. time= 829.5 min (1,703.2 - 873.7)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|---|
| #1 | 96.17' | 4,287 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 26,630 cf | 106.00'W x 288.42'L x 3.50'H Field A |
| | | | 107,003 cf Overall - 40,427 cf Embedded = 66,575 cf x 40.0% Voids |
| #3A | 96.17' | 40,427 cf | ADS_StormTech SC-740 +Cap x 880 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 880 Chambers in 22 Rows |
| | | 71 244 of | Total Available Storage |

71,344 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Voic (% | ds Inc.Store %) (cubic-feet) | Cum.Store (cubic-feet) | |
|------------------|-----------|----------------------|------------|---------------------------------|---------------------------|------------------------------|
| 96.1 | 17 | 7,442 | 0. | 0.0 0.0 | 0 | |
| 97.6 | 67 | 7,442 | 35. | 5.0 3,907 | 3,907 | |
| 97.8 | 33 | 7,442 | 15. | 5.0 179 | 4,086 | |
| 98.0 |)1 | 7,442 | 15. | 5.0 201 | 4,287 | |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | on Orifice C= 0. | 600 |
| | | | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | PE Underdrain L | = 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | = 92.17' / 90.37' S | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. F | Perforations X 40 | 0.00 columns |
| | | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bre | eadth Broad-Cres | ted Rectangular Weir |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | | |
| | | | | Coet. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3.3 | 32 | |

Primary OutFlow Max=0.02 cfs @ 21.42 hrs HW=98.11' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 11.81 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.47 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 8.80 cfs potential flow)

Secondary OutFlow Max=0.26 cfs @ 21.42 hrs HW=98.11' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 0.26 cfs @ 0.83 fps)

Pond 6P: Underground Storage w/ Porous Pavement 3 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

40 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 286.42' Row Length +12.0" End Stone x 2 = 288.42' Base Length 22 Rows x 51.0" Wide + 6.0" Spacing x 21 + 12.0" Side Stone x 2 = 106.00' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

880 Chambers x 45.9 cf = 40,427.2 cf Chamber Storage

107,002.6 cf Field - 40,427.2 cf Chambers = 66,575.4 cf Stone x 40.0% Voids = 26,630.1 cf Stone Storage

Chamber Storage + Stone Storage = 67,057.4 cf = 1.539 af Overall Storage Efficiency = 62.7% Overall System Size = 288.42' x 106.00' x 3.50'

880 Chambers 3,963.1 cy Field 2,465.8 cy Stone





Pond 6P: Underground Storage w/ Porous Pavement 3

Summary for Pond 7P: Proposed Rain Garden 4 (North)

[93] Warning: Storage range exceeded by 0.35'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

| Inflow Area | a = | 24,369 sf, | 57.53% Imper | vious, Inflow | Depth = | 5.08" | for 10-Yea | r _2100 event |
|-------------|---------|--------------|-----------------|---------------|----------|----------|-------------|---------------|
| Inflow | = | 3.01 cfs @ | 12.15 hrs, Vol | ume= | 10,312 c | f | | _ |
| Outflow | = | 3.12 cfs @ | 12.15 hrs, Vol | ume= | 10,037 c | f, Atter | n= 0%, Lag= | = 0.0 min |
| Primary | = | 0.34 cfs @ | 12.15 hrs, Volu | ume= | 5,806 c | f | - | |
| Routed | to Pond | 8P : Undergr | ound Storage v | // Porous Pav | vement 4 | | | |
| Secondary | - = | 2.78 cfs @ | 12.15 hrs, Vol | ume= | 4,231 c | f | | |
| Routed | to Pond | 8P : Undergr | ound Storage v | // Porous Pa | vement 4 | | | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2 Peak Elev= 100.60' @ 12.15 hrs Surf.Area= 2,435 sf Storage= 2,453 cf

Plug-Flow detention time= 350.2 min calculated for 10,030 cf (97% of inflow) Center-of-Mass det. time= 335.1 min (1,106.3 - 771.2)

| Volume | Invert | Avail | .Stora | age Storage Descr | iption | |
|----------|---------------------|------------|------------|--|--|---|
| #1 | 98.25' | | 2,453 | 3 cf Custom Stage | e Data (Conic)Listed | l below (Recalc) |
| Elevatio | on Su | rf.Area | Voids | s Inc.Store | Cum.Store | Wet.Area |
| (tee | et) | (sq-ft) | (% |) (cubic-feet) | (cubic-feet) | <u>(sq-ft)</u> |
| 98.2 | 25 | 1,870 | 0.0 | 0 0 | 0 | 1,870 |
| 99.2 | 25 | 1,870 | 35.0 |) 655 | 655 | 2,023 |
| 99.5 | 50 | 1,870 | 25.0 |) 117 | 771 | 2,062 |
| 100.0 | 00 | 2,435 | 100.0 | 0 1,073 | 1,845 | 2,633 |
| 100.2 | 25 | 2,435 | 100.0 |) 609 | 2,453 | 2,676 |
| Device | Routing | Inv | /ert | Outlet Devices | | |
| #1 #2 | Primary Device 1 | 98. 98. | 15' 15' | 4.0" Round Culver Inlet / Outlet Invert= n= 0.020 Corrugate 0.5" Vert. Restrictiv | t L= 11.0' Ke= 0.5 98.15' / 98.09' S= 0 d PE, corrugated int /e Orifice C= 0.600 | 00 0.0055 '/' Cc= 0.900 erior, Flow Area= 0.09 sf) |
| | D · · · | | 0.51 | Limited to weir flow | at low heads | |
| #3 | Device 2 | 98. | 25' | 4.0" Round 4" HDF Inlet / Outlet Invert= n= 0.020 Corrugate | PE Underdrain L= 2 98.25' / 98.15' S= (d PE, corrugated int | 20.0' Ke= 0.500 0.0050 '/' Cc= 0.900 erior, Flow Area= 0.09 sf |
| #4 | Device 3 | 98. | 25' | 0.9" x 0.1" Horiz. P X 3 rows C= 0.600 | erforations X 400.0 Limited to weir flow | 0 columns at low heads |
| #5 | Device 1 | 100. | 00' | 4.0" Horiz. Drainted Limited to weir flow a | ch Atrium C= 0.600 at low heads | 0 |
| #6 | Secondary | 100. | 10' | 3.0' long x 2.0' bre Head (feet) 0.20 0. 2.50 3.00 3.50 Coef. (English) 2.54 2.85 3.07 3.20 3.3 | adth Broad-Crested 40 0.60 0.80 1.00 4 2.61 2.61 2.60 2 2 | d Rectangular Weir 1.20 1.40 1.60 1.80 2.00 .66 2.70 2.77 2.89 2.88 |

Primary OutFlow Max=0.34 cfs @ 12.15 hrs HW=100.60' (Free Discharge) 1=Culvert (Passes 0.34 cfs of 0.46 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.50 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.36 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.54 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.33 cfs @ 3.73 fps)

Secondary OutFlow Max=2.76 cfs @ 12.15 hrs HW=100.60' (Free Discharge) GeBroad-Crested Rectangular Weir (Weir Controls 2.76 cfs @ 1.84 fps)



Pond 7P: Proposed Rain Garden 4 (North)

Summary for Pond 8P: Underground Storage w/ Porous Pavement 4

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 97,166 sf, 80.96% Impervious, | Inflow Depth > 5.50" for 10-Year _2100 event |
|---------------|--------------------------------|--|
| Inflow = | 12.81 cfs @ 12.15 hrs, Volume= | 44,559 cf |
| Outflow = | 0.18 cfs @ 21.01 hrs, Volume= | 7,658 cf, Atten= 99%, Lag= 531.8 min |
| Primary = | 0.02 cfs @ 21.01 hrs, Volume= | 3,908 cf |
| Secondary = | 0.17 cfs @ 21.01 hrs, Volume= | 3,750 cf |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 98.08' @ 21.01 hrs Surf.Area= 33,612 sf Storage= 38,983 cf

Plug-Flow detention time= 1,309.4 min calculated for 7,653 cf (17% of inflow) Center-of-Mass det. time= 972.6 min (1,805.3 - 832.7)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 9,112 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 15,592 cf | 63.25'W x 281.30'L x 3.50'H Field A |
| | | | 62,272 cf Overall - 23,292 cf Embedded = 38,980 cf x 40.0% Voids |
| #3A | 96.17' | 23,292 cf | ADS_StormTech SC-740 +Cap x 507 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 507 Chambers in 13 Rows |
| | | 17 006 cf | Total Available Storage |

47,996 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void (% | ls Inc.Store | Cum.Store (cubic-feet) | | | |
|------------------|-----------|----------------------|------------|---|---------------------------|------------------------------|--|--|
| 96.1 | 17 | 15,820 | 0. | 0 0 | 0 | | | |
| 97.6 | 67 | 15,820 | 35. | 0 8,306 | 8,306 | | | |
| 97.8 | 33 | 15,820 | 15. | 0 380 | 8,685 | | | |
| 98.0 |)1 | 15,820 | 15. | 0 427 | 9,112 | | | |
| Device | Routina | In | vert | Outlet Devices | | | | |
| #1 | Primary | 92 | 07' | 0.5" Vert Restricti | on Orifice C= 0 | 600 | | |
| | i innary | 02 | | Limited to weir flow | at low heads | | | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 | | | | |
| | | | | Inlet / Outlet Invert= | 92.17 / 90.37 | S = 0.0050 % Cc= 0.900 | | |
| 40 | Davia 0 | 00 | 471 | | ed PE, corrugated | Interior, Flow Area= 0.20 st | | |
| #3 | Device 2 | 92 | . 17 | U.9 X U.1 HOFIZ. P | erforations X 40 | U.UU COlumns | | |
| #1 | Sacanda | m/ 00 | 001 | X 3 10WS C = 0.000 | Limited to weir in | ow at low neads | | |
| #4 | Seconda | ry 90 | .00 | 3.0° long x 2.0° breadth Broad-Crested Rectangular Weir | | | | |
| | | | | | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 | | |
| | | | | $2.50 \ 3.00 \ 3.50$ | 4 0 04 0 04 0 00 | | | |
| | | | | | 4 2.01 2.01 2.0U | 2.00 2.10 2.11 2.89 2.88 | | |
| | | | | 2.00 3.07 3.20 3.3 | DZ | | | |

Primary OutFlow Max=0.02 cfs @ 21.01 hrs HW=98.08' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 11.78 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.47 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 8.78 cfs potential flow)

Secondary OutFlow Max=0.16 cfs @ 21.01 hrs HW=98.08' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 0.16 cfs @ 0.71 fps)

Pond 8P: Underground Storage w/ Porous Pavement 4 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

39 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 279.30' Row Length +12.0" End Stone x 2 = 281.30' Base Length
13 Rows x 51.0" Wide + 6.0" Spacing x 12 + 12.0" Side Stone x 2 = 63.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

507 Chambers x 45.9 cf = 23,291.6 cf Chamber Storage

62,272.0 cf Field - 23,291.6 cf Chambers = 38,980.5 cf Stone x 40.0% Voids = 15,592.2 cf Stone Storage

Chamber Storage + Stone Storage = 38,883.8 cf = 0.893 af Overall Storage Efficiency = 62.4% Overall System Size = 281.30' x 63.25' x 3.50'

507 Chambers 2,306.4 cy Field 1,443.7 cy Stone


Pond 8P: Underground Storage w/ Porous Pavement 4

Summary for Pond 9P: Proposed Rain Garden 3 (North East)

[93] Warning: Storage range exceeded by 0.25'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=3)

[62] Hint: Exceeded Reach 2R OUTLET depth by 0.13' @ 12.25 hrs

19,898 sf, 48.83% Impervious, Inflow Depth = 4.90" for 10-Year 2100 event Inflow Area = Inflow = 2.15 cfs @ 12.20 hrs, Volume= 8,117 cf 2.25 cfs @ 12.16 hrs, Volume= 7,978 cf, Atten= 0%, Lag= 0.0 min Outflow = 0.31 cfs @ 12.16 hrs, Volume= Primary 5.026 cf = Routed to Pond 10P : Underground Storage w/ Porous Pavement 5 Secondary = 1.94 cfs @ 12.16 hrs, Volume= 2,952 cf Routed to Pond 10P : Underground Storage w/ Porous Pavement 5

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.50' @ 12.16 hrs Surf.Area= 1,670 sf Storage= 1,751 cf

Plug-Flow detention time= 356.4 min calculated for 7,972 cf (98% of inflow) Center-of-Mass det. time= 347.2 min (1,127.8 - 780.6)

| Volume | Invert | Avail | .Stor | age | ge Storage Description | | | |
|-------------------------|----------------------|----------------|---|--|--------------------------------------|---|---|--|
| #1 98.25' 1,75 | | 1 cf | Custom Stage D | ata (Conic)Listed | below (Recalc) | | | |
| Elevation Surf.Area Voi | | Voids | | Inc.Store | Cum.Store | Wet.Area | | |
| (fee | et) | (sq-ft) | (% |) | (cubic-feet) | (cubic-feet) | <u>(sq-ft)</u> | |
| 98.2 | 25 | 1,385 | 0. | 0 | 0 | 0 | 1,385 | |
| 99.2 | 25 | 1,385 | 35. | 0 | 485 | 485 | 1,517 | |
| 99.5 | 50 | 1,385 | 25. | 0 | 87 | 571 | 1,550 | |
| 100.0 | 00 | 1,670 | 100. | 0 | 763 | 1,334 | 1,843 | |
| 100.2 | 25 | 1,670 | 100. | 0 | 418 | 1,751 | 1,879 | |
| Device | Routing | Inv | /ert | Outle | et Devices | | | |
| #1 | Primary | 98.15' | | 4.0" Round Culvert L= 11.0' Ke= 0.500 Inlet / Outlet Invert= 98.15' / 98.09' S= 0.0055 '/' Cc= 0.900 n= 0.020. Corrugated PE_corrugated interior_Elow Area= 0.09 sf | | | | |
| #2 | Device 1 | 98.15' | | 0.5" Vert. Restrictive Orifice C= 0.600 Limited to weir flow at low heads | | | | |
| #3 | Device 2 | 98.25' | | 4.0 " Inlet | Round 4" HDPE / Outlet Invert= 98 | Underdrain L= 20 .25' / 98.15' S= 0 | 0.0' Ke= 0.500 .0050 '/' Cc= 0.900 prior Elow Area= 0.09 sf | |
| #4 | Device 3 | evice 3 98.25' | | 0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads | | | | |
| #5 | Device 1 100.00' | | 00' | 4.0" Horiz. Draintech Atrium C= 0.600 | | | | |
| #6 | #6 Secondary 100.10' | | Limited to weir flow at low heads 3.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32 | | | | | |

Primary OutFlow Max=0.30 cfs @ 12.16 hrs HW=100.48' (Free Discharge) 1=Culvert (Passes 0.30 cfs of 0.45 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.32 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.35 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.39 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.29 cfs @ 3.34 fps)

Secondary OutFlow Max=1.84 cfs @ 12.16 hrs HW=100.48' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 1.84 cfs @ 1.61 fps)



Pond 9P: Proposed Rain Garden 3 (North East)

Summary for Pond 10P: Underground Storage w/ Porous Pavement 5

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 78,061 sf, 72.85% Impervious, | Inflow Depth > 5.32" for 10-Year _2100 event |
|---------------|-------------------------------|--|
| Inflow = | 8.75 cfs @ 12.18 hrs, Volume= | 34,619 cf |
| Outflow = | 0.19 cfs @ 18.06 hrs, Volume= | 7,939 cf, Atten= 98%, Lag= 352.9 min |
| Primary = | 0.02 cfs @ 18.06 hrs, Volume= | 3,905 cf |
| Secondary = | 0.17 cfs @ 18.06 hrs, Volume= | 4,034 cf |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 98.08' @ 18.06 hrs Surf.Area= 27,852 sf Storage= 28,659 cf

Plug-Flow detention time= 1,188.0 min calculated for 7,939 cf (23% of inflow) Center-of-Mass det. time= 897.9 min (1,742.9 - 845.0)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 9,426 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 10,110 cf | 63.25'W x 181.62'L x 3.50'H Field A |
| | | | 40,205 cf Overall - 14,931 cf Embedded = 25,275 cf x 40.0% Voids |
| #3A | 96.17' | 14,931 cf | ADS_StormTech SC-740 +Cap x 325 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 325 Chambers in 13 Rows |
| | | 24 467 of | Total Available Starage |

34,467 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevation (feet) | | Surf.Area Void (sq-ft) (% | | s Inc.Store) (cubic-feet) | Cum.Store (cubic-feet) | | | |
|---------------------|----------|------------------------------|------|---|---------------------------|-----------------------------|--|--|
| 96.1 | 17 | 16,365 | 0. | 0 0 | 0 | | | |
| 97.6 | 67 | 16,365 | 35. | 0 8,592 | 8,592 | | | |
| 97.8 | 33 | 16,365 | 15. | 0 393 | 8,984 | | | |
| 98.0 |)1 | 16,365 | 15. | 0 442 | 9,426 | | | |
| Device | Routing | In | vert | Outlet Devices | | | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restrictio | on Orifice C= 0.0 | 600 | | |
| | | | | Limited to weir flow at low heads | | | | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 | | | | |
| | | | | Inlet / Outlet Invert= | 92.17'/90.37' S | S= 0.0050 '/' Cc= 0.900 | | |
| | | | | n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf | | | | |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. Pe | erforations X 400 | 0.00 columns | | |
| | - · | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads | | |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' brea | adth Broad-Cres | ted Rectangular Weir | | |
| | | | | Head (feet) 0.20 0.4 | 40 0.60 0.80 1.0 | 00 1.20 1.40 1.60 1.80 2.00 | | |
| | | | | 2.50 3.00 3.50 | | | | |
| | | | | Coef. (English) 2.54 | 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 | | |
| | | | | 2.85 3.07 3.20 3.32 | 2 | | | |

Primary OutFlow Max=0.02 cfs @ 18.06 hrs HW=98.08' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 11.78 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.47 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 8.78 cfs potential flow)

Secondary OutFlow Max=0.17 cfs @ 18.06 hrs HW=98.08' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 0.17 cfs @ 0.71 fps)

Pond 10P: Underground Storage w/ Porous Pavement 5 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

25 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 179.62' Row Length +12.0" End Stone x 2 = 181.62' Base Length 13 Rows x 51.0" Wide + 6.0" Spacing x 12 + 12.0" Side Stone x 2 = 63.25' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

325 Chambers x 45.9 cf = 14,930.5 cf Chamber Storage

40,205.4 cf Field - 14,930.5 cf Chambers = 25,274.9 cf Stone x 40.0% Voids = 10,110.0 cf Stone Storage

Chamber Storage + Stone Storage = 25,040.5 cf = 0.575 af Overall Storage Efficiency = 62.3% Overall System Size = 181.62' x 63.25' x 3.50'

325 Chambers 1,489.1 cy Field 936.1 cy Stone





Summary for Pond 11P: Proposed Rain Garden 2 (East)

[93] Warning: Storage range exceeded by 0.45'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=4)

Inflow Area = 32,033 sf, 45.19% Impervious, Inflow Depth = 4.82" for 10-Year 2100 event 3.22 cfs @ 12.22 hrs, Volume= Inflow = 12,863 cf 4.03 cfs @ 12.20 hrs, Volume= 0.37 cfs @ 12.20 hrs, Volume= = Outflow 12,635 cf, Atten= 0%, Lag= 0.0 min Primarv = 7.625 cf Routed to Pond 12P : Underground Storage w/ Porous Pavement 6 3.66 cfs @ 12.20 hrs, Volume= Secondary = 5.010 cf Routed to Pond 12P : Underground Storage w/ Porous Pavement 6

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.70' @ 12.20 hrs Surf.Area= 3,045 sf Storage= 3,267 cf

Plug-Flow detention time= 422.2 min calculated for 12,626 cf (98% of inflow) Center-of-Mass det. time= 412.6 min (1,197.5 - 784.9)

| Volume | Invert | Invert Avail.S | | age Storage Description | | | | |
|--|----------------------------|---|---|---|--|---|--|--|
| #1 98.25' | | 3,267 cf | | cf Custom Stage | Custom Stage Data (Conic)Listed below (Recalc) | | | |
| Elevation Si | | rf.Area Voic | | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) | | |
| 98.2 99.2 99.5 100.0 100.2 | 25 25 50 00 25 | 2,635 2,635 2,635 3,045 3,045 | 0.0 35.0 25.0 100.0 100.0 | 0 922 165 1,419 761 | 0 922 1,087 2,506 3,267 | 2,635 2,817 2,862 3,283 3,332 | | |
| Device | Routing | Inv | vert (| Outlet Devices | | | | |
| #1 | #1 Primary 98.15' | | 15' 4 | 4.0" Round Culvert L= 11.0' Ke= 0.500 Inlet / Outlet Invert= 98.15' / 98.09' S= 0.0055 '/' Cc= 0.900 n= 0.020. Corrugated PE_corrugated interior_Flow Area= 0.09 sf | | | | |
| #2 | Device 1 | 98.15' | | 0.7" Vert. Restrictive Orifice C= 0.600 Limited to weir flow at low heads | | | | |
| #3 | Device 2 | 98.25' | | 4.0" Round 4" HDPE Underdrain L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 98.25' / 98.15' S= 0.0050 '/' Cc= 0.900 n= 0.020. Corrugated PE_corrugated interior_Elow Area= 0.09 sf | | | | |
| #4 | #4 Device 3 98.25' | | 25' | 0.9" x 0.1" Horiz. Perforations X 400.00 columns | | | | |
| #5 | Device 1 | vice 1 100.00' | | 4.0" Horiz. Draintech Atrium C= 0.600 | | | | |
| #6 | #6 Secondary 100.10' | | 3.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32 | | | | | |

| Site1HillsboroughMunicpComplex_20240628 NOAA 24-hr C 10-Year | _2100 Rainfall=6.21" |
|---|----------------------|
| Prepared by Rutgers Cooperative Extension Water Resources Program | Printed 6/29/2024 |
| HydroCAD® 10.10-7c s/n 03601 © 2022 HydroCAD Software Solutions LLC | Page 189 |

Primary OutFlow Max=0.37 cfs @ 12.20 hrs HW=100.69' (Free Discharge) 1=Culvert (Passes 0.37 cfs of 0.47 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.02 cfs @ 7.63 fps) 3=4" HDPE Underdrain (Passes 0.02 cfs of 0.37 cfs potential flow) 4=Perforations (Passes 0.02 cfs of 5.64 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.35 cfs @ 4.00 fps)

Secondary OutFlow Max=3.58 cfs @ 12.20 hrs HW=100.69' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 3.58 cfs @ 2.01 fps)



Pond 11P: Proposed Rain Garden 2 (East)

Summary for Pond 12P: Underground Storage w/ Porous Pavement 6

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 32,033 sf, 45.19% Impervious, | Inflow Depth > 4.73" for 10-Year _2100 event |
|---------------|-------------------------------|--|
| Inflow = | 4.03 cfs @ 12.20 hrs, Volume= | 12,635 cf |
| Outflow = | 0.02 cfs @ 41.49 hrs, Volume= | 3,624 cf, Atten= 100%, Lag= 1,757.4 min |
| Primary = | 0.02 cfs @ 41.49 hrs, Volume= | 3,624 cf |
| Secondary = | 0.00 cfs @ 0.00 hrs, Volume= | 0 cf |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 97.83' @ 41.49 hrs Surf.Area= 8,364 sf Storage= 9,407 cf

Plug-Flow detention time= 1,679.1 min calculated for 3,624 cf (29% of inflow) Center-of-Mass det. time= 1,191.7 min (2,389.1 - 1,197.5)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|---|
| #1 | 96.17' | 1,866 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 4,603 cf | 25.25'W x 202.98'L x 3.50'H Field A |
| | | | 17,938 cf Overall - 6,432 cf Embedded = 11,506 cf x 40.0% Voids |
| #3A | 96.17' | 6,432 cf | ADS_StormTech SC-740 +Cap x 140 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 140 Chambers in 5 Rows |
| | | 12 000 of | Total Available Storage |

12,900 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevation (feet) | | Surf.Area Voic (sq-ft) (% | | ds Inc.Store 6) (cubic-feet) | Cum.Store (cubic-feet) | | | |
|---------------------|----------|------------------------------|------|---|---------------------------|-----------------------------|--|--|
| 96.1 | 17 | 3,239 | 0. | .0 0 | 0 | | | |
| 97.6 | 67 | 3,239 | 35. | .0 1,700 | 1,700 | | | |
| 97.8 | 33 | 3,239 | 15. | .0 78 | 1,778 | | | |
| 98.0 | 01 | 3,239 | 15. | .0 87 | 1,866 | | | |
| Device | Routing | In | vert | Outlet Devices | | | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | ion Orifice C= 0. | 600 | | |
| | | | | Limited to weir flow at low heads | | | | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 | | | | |
| | | | | Inlet / Outlet Invert= | = 92.17' / 90.37' S | S= 0.0050 '/' Cc= 0.900 | | |
| | | | | n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf | | | | |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. F | Perforations X 40 | 0.00 columns | | |
| | - · | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads | | |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bro | eadth Broad-Cres | ted Rectangular Weir | | |
| | | | | Head (feet) 0.20 0 | 0.40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 | | |
| | | | | 2.50 3.00 3.50 | | | | |
| | | | | Coet. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 | | |
| | | | | 2.85 3.07 3.20 3.3 | 32 | | | |

Primary OutFlow Max=0.02 cfs @ 41.49 hrs HW=97.83' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 11.54 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.46 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 8.59 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 12P: Underground Storage w/ Porous Pavement 6 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

28 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 200.98' Row Length +12.0" End Stone x 2 = 202.98' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

140 Chambers x 45.9 cf = 6,431.6 cf Chamber Storage

17,938.1 cf Field - 6,431.6 cf Chambers = 11,506.5 cf Stone x 40.0% Voids = 4,602.6 cf Stone Storage

Chamber Storage + Stone Storage = 11,034.2 cf = 0.253 af Overall Storage Efficiency = 61.5% Overall System Size = 202.98' x 25.25' x 3.50'

140 Chambers 664.4 cy Field 426.2 cy Stone





Summary for Link 1L: Offsite Flows

| Inflow A | Area = | 927,363 sf, | 3.35% Impervious, | Inflow Depth = 3.44" | for 10-Year _2100 event |
|----------|--------|-------------|--------------------|----------------------|-------------------------|
| Inflow | = | 52.18 cfs @ | 12.32 hrs, Volume= | 265,592 cf | |
| Primar | y = | 52.18 cfs @ | 12.32 hrs, Volume= | 265,592 cf, Atter | n= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 1L: Offsite Flows



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| Subcatchment1S: DA1: CN w/ IC | Runoff Area=56,173 sf 73.47% Impervious Runoff Depth=4.30" Flow Length=361' Tc=14.3 min CN=75/98 Runoff=4.81 cfs 20,135 cf |
|---|---|
| Subcatchment 1Sa: Existing RG 1_W | /est_ Runoff Area=22,637 sf 64.43% Impervious Runoff Depth=4.15" Flow Length=361' Tc=14.3 min CN=77/98 Runoff=1.89 cfs 7,833 cf |
| Subcatchment1Sb: DA1: CN w/ IC | Runoff Area=39,105 sf 68.25% Impervious Runoff Depth=4.18" Flow Length=361' Tc=14.3 min CN=75/98 Runoff=3.27 cfs 13,618 cf |
| Subcatchment 2S: DA 2: CN w/ IC are | eas Runoff Area=58,249 sf 86.46% Impervious Runoff Depth=4.62" Flow Length=391' Tc=7.0 min CN=76/98 Runoff=6.63 cfs 22,415 cf |
| Subcatchment3S: DA 3: CN w/ IC | Runoff Area=158,623 sf 63.48% Impervious Runoff Depth=4.10" Flow Length=441' Tc=8.3 min CN=76/98 Runoff=15.80 cfs 54,189 cf |
| Subcatchment 3Sa: Existing RG 2 From 1997 | ont DA Runoff Area=25,889 sf 48.62% Impervious Runoff Depth=3.90" Tc=8.3 min CN=79/98 Runoff=2.51 cfs 8,423 cf |
| Subcatchment3Sb: RG 1 DA | Runoff Area=21,388 sf 65.14% Impervious Runoff Depth=4.08" Flow Length=441' Tc=8.3 min CN=74/98 Runoff=2.11 cfs 7,264 cf |
| Subcatchment3Sc: DA 3: CN w/ IC a | reas Runoff Area=111,346 sf 66.62% Impervious Runoff Depth=4.14" Flow Length=441' Tc=8.3 min CN=75/98 Runoff=11.15 cfs 38,421 cf |
| Subcatchment4S: DA 4: CN w/ IC | Runoff Area=86,816 sf 90.62% Impervious Runoff Depth=4.70" Flow Length=143' Tc=8.4 min CN=75/98 Runoff=9.58 cfs 34,025 cf |
| Subcatchment4Sa: RG 4 DA | Runoff Area=24,369 sf 57.53% Impervious Runoff Depth=4.08" Flow Length=143' Tc=8.4 min CN=79/98 Runoff=2.43 cfs 8,287 cf |
| Subcatchment4Sb: DA 4: CN w/ IC a | reas Runoff Area=72,797 sf 88.81% Impervious Runoff Depth=4.66" Flow Length=143' Tc=8.4 min CN=75/98 Runoff=7.97 cfs 28,274 cf |
| Subcatchment5S: DA 5: CN w/ IC | Runoff Area=78,058 sf 72.85% Impervious Runoff Depth=4.33" Flow Length=310' Tc=11.5 min CN=77/98 Runoff=7.29 cfs 28,198 cf |
| Subcatchment5Sa: RG 3 DA | Runoff Area=19,898 sf 48.83% Impervious Runoff Depth=3.91" Flow Length=310' Tc=11.5 min CN=79/98 Runoff=1.73 cfs 6,480 cf |
| Subcatchment5Sb: DA 5: CN w/ IC a | reas Runoff Area=58,163 sf 81.07% Impervious Runoff Depth=4.48" Flow Length=310' Tc=11.5 min CN=75/98 Runoff=5.56 cfs 21,711 cf |
| Subcatchment6S: DA 6: CN w/ IC are | Runoff Area=32,033 sf 45.19% Impervious Runoff Depth=3.84" Flow Length=276' Tc=14.0 min CN=79/98 Runoff=2.57 cfs 10,240 cf |
| Subcatchment 7S: DA 7 (Offsite Sout | (h): Runoff Area=107,001 sf 18.84% Impervious Runoff Depth=3.24" Flow Length=309' Tc=14.5 min CN=78/98 Runoff=7.38 cfs 28,880 cf |

Site1HillsboroughMunicpComplex_2024062VOAA 24-hr C 10-Year _Current Rainfall=5.16" Prepared by Rutgers Cooperative Extension Water Resources Program Printed 6/29/2024 HydroCAD® 10.10-7c s/n 03601 © 2022 HydroCAD Software Solutions LLC Page 196 Subcatchment 8S: DA 8 (Offsite North): CN Runoff Area=340,642 sf 1.94% Impervious Runoff Depth=2.54" Flow Length=976' Tc=19.4 min CN=74/98 Runoff=16.83 cfs 72,092 cf Runoff Area=479,720 sf 0.89% Impervious Runoff Depth=2.43" Subcatchment9S: DA 9 (Offsite Field Flow Length=1,468' Tc=30.4 min CN=73/98 Runoff=18.19 cfs 97,104 cf Subcatchment 31S: RG 2 DA Runoff Area=32,035 sf 32.46% Impervious Runoff Depth=3.58" Flow Length=276' Tc=14.0 min CN=79/98 Runoff=2.44 cfs 9,566 cf Avg. Flow Depth=0.24' Max Vel=2.14 fps Inflow=1.89 cfs 7,833 cf Reach 1R: Existing Bioswale West 1 n=0.035 L=33.0' S=0.0227 '/' Capacity=7.36 cfs Outflow=1.87 cfs 7,833 cf Avg. Flow Depth=0.33' Max Vel=2.58 fps Inflow=1.73 cfs 6,480 cf Reach 2R: Bioswale E 1 RG 3 n=0.035 L=35.0' S=0.0286 '/' Capacity=4.02 cfs Outflow=1.72 cfs 6,480 cf Peak Elev=100.48' Storage=1,831 cf Inflow=1.87 cfs 7,833 cf Pond 1P: Exising Rain Garden 1 West Primary=0.30 cfs 4,927 cf Secondary=1.80 cfs 2,729 cf Outflow=2.10 cfs 7,656 cf Pond 2P: Underground Storage w/ Porous Peak Elev=98.01' Storage=18,889 cf Inflow=5.36 cfs 21,274 cf Primary=0.02 cfs 3,840 cf Secondary=0.00 cfs 15 cf Outflow=0.02 cfs 3,855 cf Pond 3P: Underground Storage w/ Porous Peak Elev=97.81' Storage=21,269 cf Inflow=6.63 cfs 22,415 cf Primary=0.02 cfs 3,813 cf Secondary=0.00 cfs 0 cf Outflow=0.02 cfs 3,813 cf Peak Elev=101.68' Storage=3,267 cf Inflow=2.51 cfs 8,423 cf Pond 4P: Existing Rain Garden 2 Front Primary=0.36 cfs 5,119 cf Secondary=3.48 cfs 2,167 cf Outflow=3.84 cfs 7,286 cf Pond 5P: Proposed Rain Garden 1 (South Peak Elev=101.55' Storage=2,466 cf Inflow=2.11 cfs 7,264 cf Primary=0.32 cfs 4,680 cf Secondary=2.37 cfs 2,029 cf Outflow=2.69 cfs 6,708 cf Pond 6P: Underground Storage w/ Porous Peak Elev=97.74' Storage=48,662 cf Inflow=15.16 cfs 52,416 cf Primary=0.02 cfs 3,793 cf Secondary=0.00 cfs 0 cf Outflow=0.02 cfs 3,793 cf Pond 7P: Proposed Rain Garden 4 (North) Peak Elev=100.47' Storage=2,453 cf Inflow=2.43 cfs 8,287 cf Primary=0.30 cfs 5,064 cf Secondary=1.78 cfs 2,318 cf Outflow=2.08 cfs 7,382 cf Pond 8P: Underground Storage w/ Porous Peak Elev=97.66' Storage=33,144 cf Inflow=10.05 cfs 35,655 cf Primary=0.02 cfs 3,782 cf Secondary=0.00 cfs 0 cf Outflow=0.02 cfs 3,782 cf Pond 9P: Proposed Rain Garden 3 (North Peak Elev=100.46' Storage=1,751 cf Inflow=1.72 cfs 6,480 cf Primary=0.29 cfs 4,379 cf Secondary=1.65 cfs 1,964 cf Outflow=1.94 cfs 6,343 cf Pond 10P: Underground Storage w/ Porous Peak Elev=97.77' Storage=25,689 cf Inflow=7.36 cfs 28,054 cf Primary=0.02 cfs 3,806 cf Secondary=0.00 cfs 0 cf Outflow=0.02 cfs 3,806 cf Pond 11P: Proposed Rain Garden 2 (East) Peak Elev=100.61' Storage=3,267 cf Inflow=2.57 cfs 10,240 cf Primary=0.35 cfs 6,837 cf Secondary=2.77 cfs 3,180 cf Outflow=3.12 cfs 10,016 cf Pond 12P: Underground Storage w/ Porous Peak Elev=97.29' Storage=6,911 cf Inflow=3.12 cfs 10,016 cf Primary=0.01 cfs 3,435 cf Secondary=0.00 cfs 0 cf Outflow=0.01 cfs 3,435 cf

Link 1L: Offsite Flows

Inflow=38.69 cfs 198,077 cf Primary=38.69 cfs 198,077 cf

Total Runoff Area = 1,824,942 sf Runoff Volume = 517,157 cf Average Runoff Depth = 3.40" 63.76% Pervious = 1,163,653 sf 36.24% Impervious = 661,289 sf

Summary for Subcatchment 1S: DA1: CN w/ IC areas_original

Runoff = 4.81 cfs @ 12.22 hrs, Volume= 20,135 cf, Depth= 4.30"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| | A | rea (sf) | CN | Description | | |
|--|-------------|------------------|-----------------|--------------------------|-------------------|--|
| * | | 2,053 | 79 | Open space | e (fair) C | |
| * | | 12,848 | 74 | Open space | e (good) C | |
| * | | 41,272 | 98 | Impervious | , | |
| | | 56,173 | 92 | Weighted A | verage | |
| 14,901 75 26.53% Pervious Area 41,272 98 73.47% Impervious Area | | | | | vious Area | |
| | | | | | pervious Are | ea |
| | Tc (min) | Length (feet) | Slope (ft/ft | e Velocity) (ft/sec) | Capacity (cfs) | Description |
| | 12.2 | 100 | 0.0109 | 0.14 | | Sheet Flow, Sheet flow Grass: Short n= 0.150 P2= 3.34" |
| | 0.2 | 33 | 0.0280 | 2.69 | | Shallow Concentrated Flow, SCF - unpaved Unpaved Kv= 16.1 fps |
| | 1.9 | 228 | 0.0095 | 5 1.98 | | Shallow Concentrated Flow, SCF - Paved parking lot Paved Kv= 20.3 fps |
| | 14.3 | 361 | Total | | | |

Subcatchment 1S: DA1: CN w/ IC areas_original



Summary for Subcatchment 1Sa: Existing RG 1_West_ DA

Runoff = 1.89 cfs @ 12.22 hrs, Volume= 7,833 cf, Depth= 4.15" Routed to Reach 1R : Existing Bioswale West 1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| _ | A | rea (sf) | CN | Description | | |
|----------------------------------|-------------------------------|----------|--------------|-------------|----------------|---|
| * | | 5,569 | 79 | Open space | e (fair) C - F | Portion from DA 9 the field |
| * | | 14,584 | 98 | Impervious | Parking Lo | t |
| * | | 2,484 | 74 | OPen Spac | e (Good) C | - Portion from DA1 |
| | 22.637 91 Weighted Average | | | | | |
| | 8,053 77 35.57% Pervious Area | | | | | |
| 14,584 98 64.43% Impervious Area | | | | 64.43% Imp | pervious Ar | ea |
| | Tc (min) | Length | Slope | Velocity | Capacity | Description |
| _ | 12.2 | 100 | 0.0100 | | (03) | Shoot Flow, Shoot flow |
| | 12.2 | 100 | 0.0109 | 0.14 | | Grass: Short $n= 0.150$ P2= 3.34" |
| | 0.2 | 33 | 0.0280 | 2.69 | | Shallow Concentrated Flow, SCF - unpaved |
| | 4.0 | 000 | 0 0005 | 4 00 | | Unpaved Kv= 16.1 tps |
| | 1.9 | 228 | 0.0095 | 1.98 | | Shallow Concentrated Flow, SCF - Paved parking lot Paved $Kv= 20.3 \text{ fps}$ |
| | 44.0 | 0.0.4 | T () | | | |

14.3 361 Total

Subcatchment 1Sa: Existing RG 1_West_ DA



Summary for Subcatchment 1Sb: DA1: CN w/ IC areas_Remaining

Runoff = 3.27 cfs @ 12.22 hrs, Volume= 13,618 cf, Depth= 4.18" Routed to Pond 2P : Underground Storage w/ Porous Pavement 1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| | A | rea (sf) | CN | Description | | | | |
|---|-------|----------|--------|----------------------|-------------|--|--|--|
| * | | 2,053 | 79 | Open space | e (fair) C | | | |
| * | | 10,364 | 74 | Open space | e (good) C | | | |
| * | | 26,688 | 98 | Impervious | , | | | |
| _ | | 39,105 | 91 | Weighted A | verage | | | |
| | | 12,417 | 75 | 31.75% Pervious Area | | | | |
| | | 26,688 | 98 | 68.25% Imp | pervious Ar | ea | | |
| | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | |
| | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | | |
| | 12.2 | 100 | 0.0109 | 9 0.14 | | Sheet Flow, Sheet flow | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | |
| | 0.2 | 33 | 0.0280 |) 2.69 | | Shallow Concentrated Flow, SCF - unpaved | | |
| | | | | | | Unpaved Kv= 16.1 fps | | |
| | 1.9 | 228 | 0.0095 | 5 1.98 | | Shallow Concentrated Flow, SCF - Paved parking lot | | |
| | | | | | | Paved Kv= 20.3 fps | | |
| | 14.3 | 361 | Total | | | | | |

Subcatchment 1Sb: DA1: CN w/ IC areas_Remaining



Summary for Subcatchment 2S: DA 2: CN w/ IC areas

Runoff = 6.63 cfs @ 12.14 hrs, Volume= 22,415 cf, Depth= 4.62" Routed to Pond 3P : Underground Storage w/ Porous Pavement 2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| _ | A | rea (sf) | CN | Description | | | | |
|-------------------------------|--------------------------------|----------|--------|-------------|--------------------|--|--|--|
| * | | 3,767 | 79 | Open space | pen space (Fair) C | | | |
| * | | 4,118 | 74 | Open Spac | e (good) C | | | |
| * | | 50,364 | 98 | Impervious | mpervious | | | |
| 58,249 95 Weighted Average | | | | | verage | | | |
| 7,885 76 13.54% Pervious Area | | | | | vious Area | | | |
| | 50,364 98 86.46% Impervious Ar | | | | | ea | | |
| | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | |
| _ | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | | |
| | 4.8 | 18 | 0.0037 | 7 0.06 | | Sheet Flow, Sheet flow - grass | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | |
| | 2.2 | 373 | 0.0186 | 6 2.77 | | Shallow Concentrated Flow, SCF _ paved | | |
| | | | | | | Paved Kv= 20.3 fps | | |
| | 7.0 | 391 | Total | | | | | |

Subcatchment 2S: DA 2: CN w/ IC areas



Summary for Subcatchment 3S: DA 3: CN w/ IC areas_Original

Runoff = 15.80 cfs @ 12.15 hrs, Volume= 54,189 cf, Depth= 4.10"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| | A | rea (sf) | CN | Description | | | | | |
|-----------------------------|-------|----------|------------------------|-------------|--------------------|--|--|--|--|
| * | | 18,715 | 79 | Open space | pen space (Fair) C | | | | |
| * | | 39,208 | 74 | Open space | e (good) C | | | | |
| * | 1 | 00,700 | 98 | Impervious | (0) | | | | |
| 158.623 90 Weighted Average | | | Weighted A | verage | | | | | |
| 57.923 7 | | | 76 | 36.52% Per | rvious Area | | | | |
| 100,700 | | 98 | 63.48% Impervious Area | | | | | | |
| | | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | |
| _ | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | | | |
| | 5.8 | 83 | 0.0489 | 0.24 | | Sheet Flow, sheet flow - grass | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| | 2.5 | 358 | 0.0138 | 3 2.38 | | Shallow Concentrated Flow, SCF - paved | | | |
| | | | | | | Paved Kv= 20.3 fps | | | |
| | 8.3 | 441 | Total | | | | | | |

Subcatchment 3S: DA 3: CN w/ IC areas_Original



Summary for Subcatchment 3Sa: Existing RG 2 Front DA

Runoff = 2.51 cfs @ 12.15 hrs, Volume= 8,423 cf, Depth= 3.90" Routed to Pond 4P : Existing Rain Garden 2 Front

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| | Area (sf) | CN | Description | | | | |
|----|-------------|------|---------------------------------|--|--|--|--|
| * | 6,507 | 98 | Impervious Roof Top | | | | |
| * | 966 | 98 | Gravel surface, HSG C - Path | | | | |
| * | 5,114 | 98 | Impervious Sidewalk | | | | |
| | 13,302 | 79 | 50-75% Grass cover, Fair, HSG C | | | | |
| | 25,889 | 88 | Weighted Average | | | | |
| | 13,302 | 79 | 51.38% Pervious Area | | | | |
| | 12,587 | 98 | 48.62% Impervious Area | | | | |
| | Tc Length | Slop | e Velocity Capacity Description | | | | |
| (m | nin) (feet) | (ft/ | t) (ft/sec) (cfs) | | | | |
| | 0 0 | | Dive at Easters | | | | |



Direct Entry,

Subcatchment 3Sa: Existing RG 2 Front DA



Summary for Subcatchment 3Sb: RG 1 DA

Runoff = 2.11 cfs @ 12.15 hrs, Volume= 7,264 cf, Depth= 4.08" Routed to Pond 5P : Proposed Rain Garden 1 (South West)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| | A | rea (sf) | CN | Description | | | | | |
|---|-------|----------|--------|-------------|--------------------|--|--|--|--|
| * | | 7,455 | 74 | Open space | pen space (good) C | | | | |
| * | | 10,303 | 98 | Impervious | - Roof top | | | | |
| * | | 3,630 | 98 | Impervious | - Road / Si | dewalk | | | |
| | | 21,388 | 90 | Weighted A | verage | | | | |
| | | 7,455 | 74 | 34.86% Pe | rvious Area | | | | |
| | | 13,933 | 98 | 65.14% Imp | pervious Are | ea | | | |
| | | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | |
| | (min) | (feet) | (ft/ft | :) (ft/sec) | (cfs) | | | | |
| | 5.8 | 83 | 0.0489 | 9 0.24 | | Sheet Flow, sheet flow - grass | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| | 2.5 | 358 | 0.0138 | 3 2.38 | | Shallow Concentrated Flow, SCF - paved | | | |
| | | | | | | Paved Kv= 20.3 fps | | | |
| | 8.3 | 441 | Total | | | | | | |

Subcatchment 3Sb: RG 1 DA



Summary for Subcatchment 3Sc: DA 3: CN w/ IC areas Remaining

Runoff = 11.15 cfs @ 12.15 hrs, Volume= 38,421 cf, Depth= 4.14" Routed to Pond 6P : Underground Storage w/ Porous Pavement 3

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| | A | rea (sf) | CN | Description | | | | | | |
|----------------------------------|-------|----------|--------|-------------|--------------------|--|--|--|--|--|
| * | | 5,413 | 79 | Open space | pen space (Fair) C | | | | | |
| * | | 31,753 | 74 | Open space | e (good) C | | | | | |
| * | | 74,180 | 98 | Impervious | (0) | | | | | |
| _ | 1 | 11,346 | 90 | Weighted A | verage | | | | | |
| 37,166 75 33.38% Pervious Area | | | | 33.38% Pe | rvious Area | | | | | |
| 74,180 98 66.62% Impervious Area | | | | 66.62% Imp | pervious Are | ea | | | | |
| | | | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | | |
| _ | (min) | (feet) | (ft/ft | i) (ft/sec) | (cfs) | | | | | |
| | 5.8 | 83 | 0.048 | 9 0.24 | | Sheet Flow, sheet flow - grass | | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | | |
| | 2.5 | 358 | 0.013 | 8 2.38 | | Shallow Concentrated Flow, SCF - paved | | | | |
| | | | | | | Paved Kv= 20.3 fps | | | | |
| | 8.3 | 441 | Total | | | | | | | |

Subcatchment 3Sc: DA 3: CN w/ IC areas Remaining



Summary for Subcatchment 4S: DA 4: CN w/ IC areas_original

Runoff = 9.58 cfs @ 12.15 hrs, Volume= 34,025 cf, Depth= 4.70"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year Current Rainfall=5.16"

| | A | rea (sf) | CN | Description | | | | | |
|---|-------|------------------------------|--------|---------------------|-------------|--|--|--|--|
| * | | 1,403 | 79 | Open space (fair) C | | | | | |
| * | | 446 | 84 | Open space | e (fair) D | | | | |
| * | | 6,298 | 74 | Open space | e (good) C | | | | |
| * | | 78,669 | 98 | Impervious | , | | | | |
| | | 86,816 | 96 | Weighted A | verage | | | | |
| | | 8,147 75 9.38% Pervious Area | | | | | | | |
| | | 78,669 | 98 | 90.62% Imp | pervious Ar | ea | | | |
| | | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | |
| | (min) | (feet) | (ft/ft | :) (ft/sec) | (cfs) | | | | |
| | 7.9 | 67 | 0.0144 | 4 0.14 | | Sheet Flow, sheet flow - grass | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| | 0.5 | 76 | 0.0155 | 5 2.53 | | Shallow Concentrated Flow, SCF - Paved | | | |
| | | | | | | Paved Kv= 20.3 fps | | | |
| | 8.4 | 143 | Total | | | | | | |

Subcatchment 4S: DA 4: CN w/ IC areas_original



Hydrograph

Summary for Subcatchment 4Sa: RG 4 DA

Runoff = 2.43 cfs @ 12.15 hrs, Volume= 8,287 cf, Depth= 4.08" Routed to Pond 7P : Proposed Rain Garden 4 (North)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| | A | rea (sf) | CN | Description | | | | |
|----------------------------------|-------------|----------|--------------|-------------------------------|-------------|---|--|--|
| * | | 10,350 | 79 | Open space (fair) C from DA 8 | | | | |
| * | | 14,019 | 98 | Impervious | Parkinglot | | | |
| | | 24,369 | 90 | Weighted A | verage | | | |
| | | 10,350 | 79 | 42.47% Pe | rvious Area | | | |
| 14,019 98 57.53% Impervious Area | | | | | | ea | | |
| | Tc (min) | Length | Slope | e Velocity | Capacity | Description | | |
| _ | 7.9 | 67 | 0.0144 | 4 0.14 | (010) | Sheet Flow, sheet flow - grass Grass: Short n= 0.150 P2= 3.34" | | |
| | 0.5 | 76 | 0.015 | 5 2.53 | | Shallow Concentrated Flow, SCF - Paved Paved Kv= 20.3 fps | | |
| | 0.4 | 4.40 | T () | | | | | |

8.4 143 Total

Subcatchment 4Sa: RG 4 DA



Summary for Subcatchment 4Sb: DA 4: CN w/ IC areas

Runoff = 7.97 cfs @ 12.15 hrs, Volume= 28,274 cf, Depth= 4.66" Routed to Pond 8P : Underground Storage w/ Porous Pavement 4

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| | A | vrea (sf) | CN | Description | | | | | |
|---|-------------------------------|-----------|--------|-------------|---------------------|--|--|--|--|
| * | | 1,403 | 79 | Open space | Open space (fair) C | | | | |
| * | | 446 | 84 | Open space | e (Ìfair) D | | | | |
| * | | 6,298 | 74 | Open space | Dpen space (good) C | | | | |
| * | | 64,650 | 98 | Impervious | , | | | | |
| | | 72,797 | 95 | Weighted A | verage | | | | |
| | 8,147 75 11.19% Pervious Area | | | | | | | | |
| | | 64,650 | 98 | 88.81% Imp | pervious Ar | ea | | | |
| | | | | | | | | | |
| | Тс | Length | Slop | e Velocity | Capacity | Description | | | |
| | (min) | (feet) | (ft/ft | t) (ft/sec) | (cfs) | | | | |
| | 7.9 | 67 | 0.014 | 4 0.14 | | Sheet Flow, sheet flow - grass | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| | 0.5 | 76 | 0.015 | 5 2.53 | | Shallow Concentrated Flow, SCF - Paved | | | |
| | | | | | | Paved Kv= 20.3 fps | | | |
| | 0.4 | 440 | Tatal | | | | | | |

8.4 143 Total

Subcatchment 4Sb: DA 4: CN w/ IC areas



Summary for Subcatchment 5S: DA 5: CN w/ IC areas_Original

Runoff = 7.29 cfs @ 12.19 hrs, Volume= 28,198 cf, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| _ | A | rea (sf) | CN | Description | | | | | |
|----------------------------------|--------------------------------|----------|------------|---------------------|------------|--|--|--|--|
| * | | 11,294 | 79 | Open Space (Fair) C | | | | | |
| * | | 9,899 | 74 | Open Spac | e (good) C | | | | |
| * | | 56,865 | 98 | Impervious | , | | | | |
| 78.058 92 Weighted Average | | | | | verage | | | | |
| | 21,193 77 27.15% Pervious Area | | | | vious Area | | | | |
| 56,865 98 72.85% Impervious Area | | | 72.85% Imp | pervious Are | ea | | | | |
| | | | | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description | | | |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | | | | |
| | 8.7 | 64 | 0.0105 | 0.12 | | Sheet Flow, Sheet flow -grass | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| | 1.3 | 179 | 0.0129 | 2.31 | | Shallow Concentrated Flow, SCF - paved | | | |
| | | | | | | Paved Kv= 20.3 fps | | | |
| | 1.5 | 67 | 0.0120 | 0.77 | | Shallow Concentrated Flow, SCF _ grass | | | |
| _ | | | | | | Short Grass Pasture Kv= 7.0 fps | | | |
| | 11.5 | 310 | Total | | | | | | |

Subcatchment 5S: DA 5: CN w/ IC areas_Original



Summary for Subcatchment 5Sa: RG 3 DA

Runoff = 1.73 cfs @ 12.19 hrs, Volume= 6,480 cf, Depth= 3.91" Routed to Reach 2R : Bioswale E 1 RG 3

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| | A | vrea (sf) | CN | Description | | | | | |
|---|-------|-----------|---------|---------------------|--------------|--|--|--|--|
| * | | 10,182 | 79 | Open Space (Fair) C | | | | | |
| * | | 9,716 | 98 | Impervious | Parking lot | | | | |
| | | 19,898 | 88 | Weighted A | verage | | | | |
| | | 10,182 | 79 | 51.17% Pei | rvious Area | | | | |
| | | 9,716 | 98 | 48.83% Imp | pervious Are | ea | | | |
| | | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | |
| | (min) | (feet) | (ft/ft) |) (ft/sec) | (cfs) | | | | |
| | 8.7 | 64 | 0.0105 | 0.12 | | Sheet Flow, Sheet flow -grass | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| | 1.3 | 179 | 0.0129 | 2.31 | | Shallow Concentrated Flow, SCF - paved | | | |
| | | | | | | Paved Kv= 20.3 fps | | | |
| | 1.5 | 67 | 0.0120 | 0.77 | | Shallow Concentrated Flow, SCF _ grass | | | |
| | | | | | | Short Grass Pasture Kv= 7.0 fps | | | |
| | | | | | | | | | |

11.5 310 Total

Subcatchment 5Sa: RG 3 DA



Summary for Subcatchment 5Sb: DA 5: CN w/ IC areas

Runoff = 5.56 cfs @ 12.19 hrs, Volume= 21,711 cf, Depth= 4.48" Routed to Pond 10P : Underground Storage w/ Porous Pavement 5

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| | A | rea (sf) | CN I | Description | | | | | |
|---|---------------------------------|----------|---------|---------------------|------------|--|--|--|--|
| * | | 1,112 | 79 | Open Space (Fair) C | | | | | |
| * | | 9,899 | 74 (| Open Spac | e (good) C | | | | |
| * | | 47,152 | 98 | mpervious | | | | | |
| | 58,163 94 Weighted Average | | | | | | | | |
| | 11,011 75 18.93% Pervious Area | | | | | | | | |
| | 47,152 98 81.07% Impervious Are | | | | | ea | | | |
| | | | | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description | | | |
| _ | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | | | | |
| | 8.7 | 64 | 0.0105 | 0.12 | | Sheet Flow, Sheet flow -grass | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| | 1.3 | 179 | 0.0129 | 2.31 | | Shallow Concentrated Flow, SCF - paved | | | |
| | | | | | | Paved Kv= 20.3 fps | | | |
| | 1.5 | 67 | 0.0120 | 0.77 | | Shallow Concentrated Flow, SCF _ grass | | | |
| _ | | | | | | Short Grass Pasture Kv= 7.0 fps | | | |

11.5 310 Total

Subcatchment 5Sb: DA 5: CN w/ IC areas



Summary for Subcatchment 6S: DA 6: CN w/ IC areas

Runoff = 2.57 cfs @ 12.22 hrs, Volume= 10,240 cf, Depth= 3.84" Routed to Pond 11P : Proposed Rain Garden 2 (East)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| | A | rea (sf) | CN I | Description | | | | |
|---|---------------------------------|----------|---------|---------------------|-------------|--|--|--|
| * | | 16,559 | 79 (| Open Space (fair) C | | | | |
| * | | 998 | 74 (| Open Spac | e (good) C | | | |
| * | | 14,476 | 98 I | mpervious | | | | |
| | 32.033 87 Weighted Average | | | | | | | |
| | 17,557 79 54.81% Pervious Area | | | | | | | |
| | 14,476 98 45.19% Impervious Are | | | | pervious Ar | ea | | |
| | | | | | | | | |
| | Tc | Length | Slope | Velocity | Capacity | Description | | |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | | | |
| | 12.8 | 100 | 0.0098 | 0.13 | | Sheet Flow, Sheet flow - grass | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | |
| | 0.5 | 86 | 0.0244 | 3.17 | | Shallow Concentrated Flow, SCF - paved | | |
| | | | | | | Paved Kv= 20.3 fps | | |
| | 0.7 | 90 | 0.0178 | 2.15 | | Shallow Concentrated Flow, SCF - unpaved | | |
| | | | | | | Unpaved Kv= 16.1 fps | | |

14.0 276 Total

Subcatchment 6S: DA 6: CN w/ IC areas



Summary for Subcatchment 7S: DA 7 (Offsite South): CN w/ IC areas

Runoff = 7.38 cfs @ 12.23 hrs, Volume= 28,880 cf, Depth= 3.24" Routed to Link 1L : Offsite Flows

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| | A | rea (sf) | CN [| Description | | | | | |
|-----------------------------|---------------------------------|----------|--------------|---------------------|-------------|--|--|--|--|
| * | | 70,444 | 79 (| Open Space (fair) C | | | | | |
| * | | 16,401 | 74 (| Dpen Spac | e (good) C | | | | |
| * | | 20,156 | 98 I | mpervious | | | | | |
| 107.001 82 Weighted Average | | | | Veighted A | verage | | | | |
| | 86,845 78 81.16% Pervious Are | | | | vious Area | | | | |
| | 20,156 98 18.84% Impervious Are | | | | pervious Ar | ea | | | |
| | | | | | | | | | |
| | Tc | Length | Slope | Velocity | Capacity | Description | | | |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | | | | |
| | 12.1 | 100 | 0.0112 | 0.14 | | Sheet Flow, Sheet flow | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| | 2.2 | 165 | 0.0305 | 1.22 | | Shallow Concentrated Flow, SCF _ grass | | | |
| | | | | | | Short Grass Pasture Kv= 7.0 fps | | | |
| | 0.2 | 44 | 0.0317 | 3.61 | | Shallow Concentrated Flow, SCF _ paved | | | |
| _ | | | | | | Paved Kv= 20.3 fps | | | |
| | | | — · · | | | | | | |

14.5 309 Total

Subcatchment 7S: DA 7 (Offsite South): CN w/ IC areas



Summary for Subcatchment 8S: DA 8 (Offsite North): CN w/ IC areas

Runoff = 16.83 cfs @ 12.29 hrs, Volume= 72,092 cf, Depth= 2.54" Routed to Link 1L : Offsite Flows

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| | Ar | rea (sf) | CN | Description | | |
|----|------|----------|--------|--------------|--------------|---|
| * | | 2,767 | 70 | Brush (fair) | С | |
| * | (| 63,031 | 77 | Brush (fair) | D | |
| * | 8 | 86,643 | 65 | Brush (goo | d) C | |
| * | (| 64,708 | 73 | Brush (goo | d) D | |
| * | - | 73,083 | 79 | Open space | e (Fair) C | |
| * | | 30,261 | 84 | Open space | e (fair) D | |
| * | | 4,460 | 74 | Open space | e (good) C | |
| * | | 9,087 | 80 | Open space | e (good) D | |
| * | | 6,602 | 98 | Impervious | | |
| | 34 | 40,642 | 75 | Weighted A | verage | |
| | 33 | 34,040 | 74 | 98.06% Pe | rvious Area | |
| | | 6,602 | 98 | 1.94% Impe | ervious Area | а |
| | _ | | | | | |
| | Tc | Length | Slope | e Velocity | Capacity | Description |
| (m | nin) | (feet) | (ft/ft |) (ft/sec) | (cfs) | |
| | 7.5 | 100 | 0.036 | 6 0.22 | | Sheet Flow, sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| 1 | 1.9 | 876 | 0.006 | 7 1.23 | | Shallow Concentrated Flow, scf - grass waterway |
| | | | | | | Grassed Waterway Kv= 15.0 fps |
| 1 | 9.4 | 976 | Total | | | |



Subcatchment 8S: DA 8 (Offsite North): CN w/ IC areas

Summary for Subcatchment 9S: DA 9 (Offsite Field West): CN w/ IC areas

Runoff = 18.19 cfs @ 12.44 hrs, Volume= Routed to Link 1L : Offsite Flows 97,104 cf, Depth= 2.43"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| | A | rea (sf) | CN | Description | | |
|--------------------------------|--------------------------------|----------|------------|-------------|--------------|---|
| * | | 72,478 | 65 | Brush (good | d) C | |
| * | | 10,448 | 79 | Open spcae | e (fair) C | |
| * | 3 | 92,515 | 74 | Open Spac | e (good) C | |
| * | | 4,279 | 98 | Impervious | | |
| | 4 | 79,720 | 73 | Weighted A | verage | |
| 475,441 73 99.11% Pervious Are | | | 99.11% Pei | vious Area | | |
| | 4,279 98 0.89% Impervious Area | | | | ervious Area | a |
| | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | |
| | 10.5 | 100 | 0.0159 | 0.16 | | Sheet Flow, Sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 7.1 | 362 | 0.0148 | 0.85 | | Shallow Concentrated Flow, SCF - grass |
| | | | | | | Short Grass Pasture Kv= 7.0 fps |
| | 12.8 | 1,006 | 0.0076 | 1.31 | | Shallow Concentrated Flow, SCF - grass waterway |
| _ | | | | | | Grassed Waterway Kv= 15.0 fps |
| | | | | | | |

30.4 1,468 Total

Subcatchment 9S: DA 9 (Offsite Field West): CN w/ IC areas


Summary for Subcatchment 31S: RG 2 DA

Runoff = 2.44 cfs @ 12.22 hrs, Volume= 9,566 cf, Depth= 3.58"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

| | A | rea (sf) | CN | Description | | | | | | | |
|--------|-------|----------|--------|--------------------------|----------------------|---|--|--|--|--|--|
| * | | 21,638 | 79 | Open Spac | e (fair) C | | | | | | |
| * | | 10,397 | 98 | Impervious | 、 | | | | | | |
| | | 32,035 | 85 | Weighted A | verage | | | | | | |
| | | 21,638 | 79 | 67.54% Pei | 37.54% Pervious Area | | | | | | |
| 10,397 | | | 98 | 8 32.46% Impervious Area | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | | | |
| | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | | | | | |
| | 12.8 | 100 | 0.0098 | 8 0.13 | | Sheet Flow, Sheet flow - grass Grass: Short n= 0.150 P2= 3.34" | | | | | |
| | 0.5 | 86 | 0.0244 | 4 3.17 | | Shallow Concentrated Flow, SCF - paved Paved Ky= 20.3 fps | | | | | |
| | 0.7 | 90 | 0.0178 | 3 2.15 | | Shallow Concentrated Flow, SCF - unpaved Unpaved Kv= 16.1 fps | | | | | |
| | 14.0 | 276 | Total | | | | | | | | |

Subcatchment 31S: RG 2 DA



Summary for Reach 1R: Existing Bioswale West 1



Time (hours)

Summary for Reach 2R: Bioswale E 1 RG 3



Time (hours)

Summary for Pond 1P: Exising Rain Garden 1 West

[93] Warning: Storage range exceeded by 0.23'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)

[62] Hint: Exceeded Reach 1R OUTLET depth by 0.24' @ 12.20 hrs

22,637 sf, 64.43% Impervious, Inflow Depth = 4.15" for 10-Year Current event Inflow Area = Inflow = 1.87 cfs @ 12.23 hrs, Volume= 7,833 cf 2.10 cfs @ 12.21 hrs, Volume= 7,656 cf, Atten= 0%, Lag= 0.0 min Outflow = 0.30 cfs @ 12.21 hrs, Volume= Primary 4,927 cf = Routed to Pond 2P : Underground Storage w/ Porous Pavement 1 Secondary = 1.80 cfs @ 12.21 hrs, Volume= 2,729 cf Routed to Pond 2P : Underground Storage w/ Porous Pavement 1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.48' @ 12.21 hrs Surf.Area= 1,750 sf Storage= 1,831 cf

Plug-Flow detention time= 387.9 min calculated for 7,656 cf (98% of inflow) Center-of-Mass det. time= 373.5 min (1,150.0 - 776.5)

| Volume | Invert | Avail.St | | age | Storage Descripti | on | | | |
|----------|------------------|----------|----------------------------|---|--|--|---|--|--|
| #1 | 98.25' | 1,831 cf | | 1 cf | Custom Stage D | ata (Conic)Listed | below (Recalc) | | |
| Elevatio | on Su | rf.Area | Void | S | Inc.Store | Cum.Store | Wet.Area | | |
| (fee | et) | (sq-ft) | t) (% | | (cubic-feet) | (cubic-feet) | (sq-ft) | | |
| 98.2 | 25 | 1,445 | 0.0 | | 0 | 0 | 1,445 | | |
| 99.2 | 25 | 1,445 | 35.0 | | 506 | 506 | 1,580 | | |
| 99.5 | 50 | 1,445 | 25. | 0 | 90 | 596 | 1,613 | | |
| 100.0 | 00 | 1,750 | 100. | 0 | 798 | 1,394 | 1,927 | | |
| 100.2 | 25 | 1,750 | 100. | 0 | 438 | 1,831 | 1,964 | | |
| Device | Routing | Inv | /ert | Outle | et Devices | | | | |
| #1 | 1 Primary 98.15' | | .15' | 4.0" Round Culvert L= 11.0' Ke= 0.500 Inlet / Outlet Invert= 98.15' / 98.09' S= 0.0055 '/' Cc= 0.900 n= 0.020 Corrugated PE. corrugated interior. Flow Area= 0.09 sf | | | | | |
| #2 | Device 1 | 98. | .15' | 0.5" Vert. Restrictive Orifice C= 0.600 Limited to weir flow at low heads | | | | | |
| #3 | Device 2 | 98. | 98.25' 4.0' Inle | | I.0" Round 4" HDPE Underdrain L= 20.0' Ke= 0.500 nlet / Outlet Invert= 98.25' / 98.15' S= 0.0050 '/' Cc= 0.900 | | | | |
| #4 | Device 3 | 98. | .25' | 0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads | | | | | |
| #5 | Device 1 | 100. | .00' | 4.0 " | Horiz. Draintech | Atrium C= 0.600 | | | |
| #6 | Secondary | 100. | .10' | 3.0' Head 2.50 Coef 2.85 | long x 2.0' bread d (feet) 0.20 0.40 3.00 3.50 f. (English) 2.54 2 3.07 3.20 3.32 | th Broad-Crested 0.60 0.80 1.00 2.61 2.61 2.60 2.0 | Rectangular Weir 1.20 1.40 1.60 1.80 2.00 66 2.70 2.77 2.89 2.88 | | |

Primary OutFlow Max=0.30 cfs @ 12.21 hrs HW=100.47' (Free Discharge) 1=Culvert (Passes 0.30 cfs of 0.45 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.30 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.35 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.38 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.29 cfs @ 3.29 fps)

Secondary OutFlow Max=1.74 cfs @ 12.21 hrs HW=100.47' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 1.74 cfs @ 1.58 fps)



Pond 1P: Exising Rain Garden 1 West

Summary for Pond 2P: Underground Storage w/ Porous Pavement 1

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area | = | 61,742 sf, | 66.85% Impervious, | Inflow Depth > 4. | 13" for 10-Year_C | Current event |
|-------------|---|------------|--------------------|-------------------|-------------------|---------------|
| Inflow : | = | 5.36 cfs @ | 12.21 hrs, Volume= | 21,274 cf | | |
| Outflow : | = | 0.02 cfs @ | 24.52 hrs, Volume= | 3,855 cf, | Atten= 100%, Lag= | 738.7 min |
| Primary : | = | 0.02 cfs @ | 24.52 hrs, Volume= | 3,840 cf | | |
| Secondary : | = | 0.00 cfs @ | 24.52 hrs, Volume= | 15 cf | | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 98.01' @ 24.52 hrs Surf.Area= 13,421 sf Storage= 18,889 cf

Plug-Flow detention time= 1,725.1 min calculated for 3,855 cf (18% of inflow) Center-of-Mass det. time= 1,379.4 min (2,288.3 - 908.9)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 1,612 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 9,359 cf | 72.75'W x 146.02'L x 3.50'H Field A |
| | | | 37,179 cf Overall - 13,782 cf Embedded = 23,397 cf x 40.0% Voids |
| #3A | 96.17' | 13,782 cf | ADS_StormTech SC-740 +Cap x 300 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 300 Chambers in 15 Rows |
| | | 24 752 of | Total Available Storage |

24,753 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void %) | ls Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | | | | |
|------------------|-----------|----------------------|------------|---|---------------------------|-----------------------------|--|--|--|
| 96.17 | | 2,798 | 0. | .0 0 | 0 | | | | |
| 97.67 | | 2,798 | 35. | .0 1,469 | 1,469 | | | | |
| 97.8 | 33 | 2,798 | 15. | .0 67 | 1,536 | | | | |
| 98.0 |)1 | 2,798 | 15. | .0 76 | 1,612 | | | | |
| Device | Routing | In | vert | Outlet Devices | | | | | |
| #1 Primary | | 92.07' | | 0.5" Vert. Restriction Orifice C= 0.600 | | | | | |
| | | | | Limited to weir flow at low heads | | | | | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 | | | | | |
| | | | | Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 '/' Cc= 0.900 | | | | | |
| | | | | n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf | | | | | |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. Perforations X 400.00 columns | | | | | |
| | | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads | | | |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bro | eadth Broad-Cres | ted Rectangular Weir | | | |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 | | | |
| | | | | 2.50 3.00 3.50 | | | | | |
| | | | | Coet. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 | | | |
| | | | | 2.85 3.07 3.20 3.3 | 32 | | | | |

Primary OutFlow Max=0.02 cfs @ 24.52 hrs HW=98.01' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 11.71 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.46 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 8.72 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 24.52 hrs HW=98.01' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 0.00 cfs @ 0.19 fps)

Pond 2P: Underground Storage w/ Porous Pavement 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

20 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 144.02' Row Length +12.0" End Stone x 2 = 146.02' Base Length 15 Rows x 51.0" Wide + 6.0" Spacing x 14 + 12.0" Side Stone x 2 = 72.75' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

300 Chambers x 45.9 cf = 13,782.0 cf Chamber Storage

37,179.5 cf Field - 13,782.0 cf Chambers = 23,397.5 cf Stone x 40.0% Voids = 9,359.0 cf Stone Storage

Chamber Storage + Stone Storage = 23,141.0 cf = 0.531 af Overall Storage Efficiency = 62.2% Overall System Size = 146.02' x 72.75' x 3.50'

300 Chambers 1,377.0 cy Field 866.6 cy Stone





Pond 2P: Underground Storage w/ Porous Pavement 1

Summary for Pond 3P: Underground Storage w/ Porous Pavement 2

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | | 58,249 sf, | 86.46% Im | pervious, | Inflow Depth = | 4.62" | for 10-Y | ′ear _Cu | irrent event |
|---------------|---|------------|--------------|-----------|----------------|----------|----------|----------|--------------|
| Inflow = | (| 6.63 cfs @ | 12.14 hrs, \ | √olume= | 22,415 c | f | | | |
| Outflow = | (| 0.02 cfs @ | 24.16 hrs, \ | /olume= | 3,813 c | f, Atten | = 100%, | Lag= 72 | 21.3 min |
| Primary = | (| 0.02 cfs @ | 24.16 hrs, \ | √olume= | 3,813 c | f | | | |
| Secondary = | (| 0.00 cfs @ | 0.00 hrs, N | /olume= | 0 c | f | | | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 97.81' @ 24.16 hrs Surf.Area= 23,296 sf Storage= 21,269 cf

Plug-Flow detention time= 1,797.2 min calculated for 3,811 cf (17% of inflow) Center-of-Mass det. time= 1,504.7 min (2,260.7 - 756.0)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 8,187 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 8,029 cf | 82.25'W x 110.42'L x 3.50'H Field A |
| | | | 31,786 cf Overall - 11,715 cf Embedded = 20,071 cf x 40.0% Voids |
| #3A | 96.17' | 11,715 cf | ADS_StormTech SC-740 +Cap x 255 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 255 Chambers in 17 Rows |
| | | 27 021 of | Total Available Storage |

27,931 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void %) | s Inc.Store Cum.Store b) (cubic-feet) (cubic-feet) | | | | | |
|------------------|-----------|----------------------|------------|---|--|--|--|--|--|
| 96.1 | 17 | 14,214 | 0. | 0 0 0 | | | | | |
| 97.6 | 67 | 14,214 | 35. | 0 7,462 7,462 | | | | | |
| 97.83 | | 14,214 | 15. | 0 341 7,803 | | | | | |
| 98.0 |)1 | 14,214 | 15. | 0 384 8,187 | | | | | |
| Device | Routing | In | vert | Outlet Devices | | | | | |
| #1 Primary | | 92 | .07' | 0.5" Vert. Restriction Orifice C= 0.600 | | | | | |
| , | | | | Limited to weir flow at low heads | | | | | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 | | | | | |
| | | | | Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 '/' Cc= 0.900 | | | | | |
| | | | | n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf | | | | | |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. Perforations X 400.00 columns | | | | | |
| | | | | X 3 rows C= 0.600 Limited to weir flow at low heads | | | | | |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' breadth Broad-Crested Rectangular Weir | | | | | |
| | | | | Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 | | | | | |
| | | | | | | | | | |
| | | | | Coet. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 | | | | | |
| | | | | 2.85 3.07 3.20 3.32 | | | | | |

Primary OutFlow Max=0.02 cfs @ 24.16 hrs HW=97.81' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 11.51 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.46 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 8.57 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P: Underground Storage w/ Porous Pavement 2 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

15 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 108.42' Row Length +12.0" End Stone x 2 = 110.42' Base Length 17 Rows x 51.0" Wide + 6.0" Spacing x 16 + 12.0" Side Stone x 2 = 82.25' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

255 Chambers x 45.9 cf = 11,714.7 cf Chamber Storage

31,786.2 cf Field - 11,714.7 cf Chambers = 20,071.5 cf Stone x 40.0% Voids = 8,028.6 cf Stone Storage

Chamber Storage + Stone Storage = 19,743.3 cf = 0.453 af Overall Storage Efficiency = 62.1% Overall System Size = 110.42' x 82.25' x 3.50'

255 Chambers 1,177.3 cy Field 743.4 cy Stone







Summary for Pond 4P: Existing Rain Garden 2 Front

[93] Warning: Storage range exceeded by 0.43'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

| Inflow Area = | | 25,889 sf, | 48.62% In | npervious, | Inflow Depth = | 3.90" | for 1 | 10-Year | Current eve | nt | |
|---------------|--|--------------|------------|------------|----------------|----------|-------|----------|-------------|----|--|
| Inflow | = | 2.51 cfs @ | 12.15 hrs, | Volume= | 8,423 c | f | | | | | |
| Outflow | = | 3.84 cfs @ | 12.20 hrs, | Volume= | 7,286 c | f, Atten | = 0% | , Lag= 2 | 2.8 min | | |
| Primary | = | 0.36 cfs @ | 12.20 hrs, | Volume= | 5,119 c | f | | - | | | |
| Routed | to Pond | 6P : Undergr | ound Stora | ge w/ Poro | us Pavement 3 | | | | | | |
| Secondary | = | 3.48 cfs @ | 12.20 hrs, | Volume= | 2,167 c | f | | | | | |
| Routed | Routed to Pond 6P : Underground Storage w/ Porous Pavement 3 | | | | | | | | | | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 101.68' @ 12.20 hrs Surf.Area= 3,045 sf Storage= 3,267 cf

Plug-Flow detention time= 542.2 min calculated for 7,281 cf (86% of inflow) Center-of-Mass det. time= 479.7 min (1,260.3 - 780.6)

| Volume | Invert | Avai | l.Storage | | Storage Descrip | tion | | | |
|------------------------|----------------|----------------------------|-------------------------------|---|---|---|---|--|--|
| #1 | 99.25' | 3,26 | | 7 cf | Custom Stage | Data (Conic)Listed | below (Recalc) | | |
| Elevation Si (feet) | | rf.Area Voic (sɑ-ft) (% | | s) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) | | |
| 99.2 | 25 | 2.635 | 0. | 0 | 0 | 0 | 2.635 | | |
| 100.2 | 25 | 2,635 | 35. | 0 | 922 | 922 | 2,817 | | |
| 100.50 | | 2,635 | 25. | 0 | 165 | 1,087 | 2,862 | | |
| 101.00 | | 3,045 | 100. | 0 | 1,419 | 2,506 | 3,283 | | |
| 101.2 | 25 | 3,045 | 100. | 0 | 761 | 3,267 | 3,332 | | |
| Device | Routing | In | vert | Outle | et Devices | | | | |
| #1 | Primary 99.15' | | 4.0" Inlet n= 0. | 4.0" Round Culvert L= 11.0' Ke= 0.500 Inlet / Outlet Invert= 99.15' / 99.09' S= 0.0055 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior. Flow Area= 0.09 sf | | | | | |
| #2 | Device 1 | 99 | .15' | 0.5" Vert. Restrictive Orifice C= 0.600 | | | | | |
| #3 | Device 2 | 99 | .25' | 4.0" Round 4" HDPE Underdrain L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 99.25' / 99.15' S= 0.0050 '/' Cc= 0.900 | | 0.0' Ke= 0.500 .0050 '/' Cc= 0.900 | | | |
| #4 | Device 3 | 3 99.25' | | n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.09 sf 0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads | | | | | |
| #5 | Device 1 | 101 | .00' | 4.0" | Horiz. Draintech | Atrium C= 0.600 | | | |
| | | | | Limit | ed to weir flow at | low heads | | | |
| #6 | Secondary | 101 | .10' | 3.0' I Head 2.50 Coef 2.85 | ong x 2.0' bread d (feet) 0.20 0.40 3.00 3.50 . (English) 2.54 3.07 3.20 3.32 | Broad-Crested 0 0.60 0.80 1.00 2.61 2.61 2.60 2.6 | Rectangular Weir 1.20 1.40 1.60 1.80 2.00 66 2.70 2.77 2.89 2.88 | | |

| Site1HillsboroughMunicpComplex_2024062NOAA 24-hr C 10-Year | _Current Rainfall=5.16" |
|---|-------------------------|
| Prepared by Rutgers Cooperative Extension Water Resources Program | Printed 6/29/2024 |
| HydroCAD® 10.10-7c s/n 03601 © 2022 HydroCAD Software Solutions LLC | Page 231 |

Primary OutFlow Max=0.35 cfs @ 12.20 hrs HW=101.67' (Free Discharge) 1=Culvert (Passes 0.35 cfs of 0.47 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.60 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.37 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.61 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.34 cfs @ 3.93 fps)

Secondary OutFlow Max=3.40 cfs @ 12.20 hrs HW=101.67' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 3.40 cfs @ 1.98 fps)



Pond 4P: Existing Rain Garden 2 Front

Summary for Pond 5P: Proposed Rain Garden 1 (South West)

[93] Warning: Storage range exceeded by 0.30'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

| Inflow Area = | | 21,388 sf, | 65.14% In | npervious, | Inflow Depth = | 4.08" | for 1 | 0-Year | _Current eve | nt | | |
|---------------|--|------------|------------|------------|----------------|----------|--------|--------|--------------|----|--|--|
| Inflow | = | 2.11 cfs @ | 12.15 hrs, | Volume= | 7,264 c | f | | | | | | |
| Outflow | = | 2.69 cfs @ | 12.15 hrs, | Volume= | 6,708 c | f, Atten | i= 0%, | Lag= (| 0.0 min | | | |
| Primary | = | 0.32 cfs @ | 12.15 hrs, | Volume= | 4,680 c | f | | - | | | | |
| Routed | Routed to Pond 6P : Underground Storage w/ Porous Pavement 3 | | | | | | | | | | | |
| Secondary | = | 2.37 cfs @ | 12.15 hrs, | Volume= | 2,029 c | f | | | | | | |
| Routed | Routed to Pond 6P : Underground Storage w/ Porous Pavement 3 | | | | | | | | | | | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 101.55' @ 12.15 hrs Surf.Area= 2,325 sf Storage= 2,466 cf

Plug-Flow detention time= 524.6 min calculated for 6,703 cf (92% of inflow) Center-of-Mass det. time= 483.7 min (1,253.5 - 769.8)

| Volume | Invert | Avail.S | ail.Storage Storage Description | | ion | | |
|----------------|---------------------------------|-------------------------|---|--|--|---|--|
| #1 | 99.25' | 2, | 466 cf | Custom Stage Data (Conic)Listed below (Recalc) | | | |
| Elevatio | on Su | rf.Area Vo | oids | Inc.Store | Cum.Store | Wet.Area | |
| (196 | θ ι) | (SQ-IL) | (70) | | | (sq-it) | |
| 99.2 | 25 | 1,970 | 0.0 | 0 | 0 | 1,970 | |
| 100.2 | 25 | 1,970 3 | 35.0 | 690 | 690 | 2,127 | |
| 100.5 | 50 | 1,970 2 | 25.0 | 123 | 813 | 2,167 | |
| 101.0 | 00 | 2,325 10 | 0.0 | 1,073 | 1,885 | 2,531 | |
| 101.2 | 25 | 2,325 10 | 0.0 | 581 | 2,466 | 2,574 | |
| Device | Routing | Inver | t Outl | et Devices | | | |
| #1 #2 #3 | Primary Device 1 Device 2 | 99.15 99.15 99.25 | 4.0" Inlet n= 0 0.5" Limi 4.0" Inlet n= 0 | Round Culvert / Outlet Invert= 99 0.020 Corrugated Vert. Restrictive ted to weir flow at Round 4" HDPE / Outlet Invert= 99 0.020 Corrugated | L= 11.0' Ke= 0.50 9.15' / 99.09' S= 0 PE, corrugated inte Orifice C= 0.600 low heads Underdrain L= 20 9.25' / 99.15' S= 0 PE, corrugated inte | 0 .0055 '/' Cc= 0.900 erior, Flow Area= 0.09 sf 0.0' Ke= 0.500 .0050 '/' Cc= 0.900 erior, Flow Area= 0.09 sf | |
| #4 | Device 3 | 99.25 | 0.9" X 3 | x 0.1" Horiz. Per rows C= 0.600 Li | forations X 400.00 mited to weir flow a | o columns at low heads | |
| #5 | Device 1 | 101.00 | 4.0'' Limi | Horiz. Draintech ted to weir flow at | Atrium C= 0.600 low heads | | |
| #6 | Secondary | 101.10 | ' 3.0' Hea 2.50 Coe 2.85 | long x 2.0' bread d (feet) 0.20 0.40 3.00 3.50 f. (English) 2.54 2 3.07 3.20 3.32 | Ith Broad-Crested 0 0.60 0.80 1.00 2.61 2.61 2.60 2.0 | Rectangular Weir 1.20 1.40 1.60 1.80 2.00 66 2.70 2.77 2.89 2.88 | |

Primary OutFlow Max=0.32 cfs @ 12.15 hrs HW=101.55' (Free Discharge) 1=Culvert (Passes 0.32 cfs of 0.46 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.43 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.36 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.48 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.31 cfs @ 3.57 fps)

Secondary OutFlow Max=2.36 cfs @ 12.15 hrs HW=101.55' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 2.36 cfs @ 1.75 fps)



Pond 5P: Proposed Rain Garden 1 (South West)

Summary for Pond 6P: Underground Storage w/ Porous Pavement 3

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area | = | 158,623 sf, | 63.48% Impervious, | Inflow Depth > | 3.97" | for 10-Y | ear _Current event |
|-------------|---|-------------|--------------------|----------------|----------|----------|--------------------|
| Inflow | = | 15.16 cfs @ | 12.17 hrs, Volume= | 52,416 c | f | | |
| Outflow | = | 0.02 cfs @ | 59.84 hrs, Volume= | 3,793 c | f, Atten | = 100%, | Lag= 2,859.8 min |
| Primary | = | 0.02 cfs @ | 59.84 hrs, Volume= | 3,793 c | f | | |
| Secondary | = | 0.00 cfs @ | 0.00 hrs, Volume= | 0 c | f | | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 97.74' @ 59.84 hrs Surf.Area= 38,014 sf Storage= 48,662 cf

Plug-Flow detention time= 1,904.4 min calculated for 3,790 cf (7% of inflow) Center-of-Mass det. time= 1,388.7 min (2,287.9 - 899.2)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|---|
| #1 | 96.17' | 4,287 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 26,630 cf | 106.00'W x 288.42'L x 3.50'H Field A |
| | | | 107,003 cf Overall - 40,427 cf Embedded = 66,575 cf x 40.0% Voids |
| #3A | 96.17' | 40,427 cf | ADS_StormTech SC-740 +Cap x 880 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 880 Chambers in 22 Rows |
| | | 71 244 of | Total Available Storage |

71,344 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Voic (% | ds Inc.Store %) (cubic-feet) | Cum.Store (cubic-feet) | | | |
|------------------|-----------|----------------------|--|-----------------------------------|---------------------------|------------------------------|--|--|
| 96.1 | 17 | 7,442 | 0. | 0.0 0.0 | 0 | | | |
| 97.6 | 67 | 7,442 | 35. | 5.0 3,907 | 3,907 | | | |
| 97.8 | 33 | 7,442 | 15. | 5.0 179 | 4,086 | | | |
| 98.0 |)1 | 7,442 | 15. | 5.0 201 | 4,287 | | | |
| Device | Routing | In | vert | Outlet Devices | | | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | on Orifice C= 0. | 600 | | |
| | | | | Limited to weir flow at low heads | | | | |
| #2 | Device 1 | 92 | 92.17' 6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 | | | | | |
| | | | | Inlet / Outlet Invert= | = 92.17' / 90.37' S | S= 0.0050 '/' Cc= 0.900 | | |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf | | |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. F | Perforations X 40 | 0.00 columns | | |
| | | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads | | |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bre | eadth Broad-Cres | ted Rectangular Weir | | |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 | | |
| | | | | 2.50 3.00 3.50 | | | | |
| | | | | Coet. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 | | |
| | | | | 2.85 3.07 3.20 3.3 | 32 | | | |

Primary OutFlow Max=0.02 cfs @ 59.84 hrs HW=97.74' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 11.45 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.45 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 8.53 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 6P: Underground Storage w/ Porous Pavement 3 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

40 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 286.42' Row Length +12.0" End Stone x 2 = 288.42' Base Length 22 Rows x 51.0" Wide + 6.0" Spacing x 21 + 12.0" Side Stone x 2 = 106.00' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

880 Chambers x 45.9 cf = 40,427.2 cf Chamber Storage

107,002.6 cf Field - 40,427.2 cf Chambers = 66,575.4 cf Stone x 40.0% Voids = 26,630.1 cf Stone Storage

Chamber Storage + Stone Storage = 67,057.4 cf = 1.539 af Overall Storage Efficiency = 62.7% Overall System Size = 288.42' x 106.00' x 3.50'

880 Chambers 3,963.1 cy Field 2,465.8 cy Stone





Pond 6P: Underground Storage w/ Porous Pavement 3

Summary for Pond 7P: Proposed Rain Garden 4 (North)

[93] Warning: Storage range exceeded by 0.22'

Inflow Area = 24,369 sf, 57.53% Impervious, Inflow Depth = 4.08" for 10-Year Current event 2.43 cfs @ 12.15 hrs, Volume= Inflow = 8.287 cf Outflow = 2.08 cfs @ 12.15 hrs, Volume= 7,382 cf, Atten= 14%, Lag= 0.0 min 0.30 cfs @ 12.15 hrs, Volume= Primary = 5,064 cf Routed to Pond 8P : Underground Storage w/ Porous Pavement 4 1.78 cfs @ 12.15 hrs, Volume= Secondary = 2.318 cf Routed to Pond 8P : Underground Storage w/ Porous Pavement 4

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2 Peak Elev= 100.47' @ 12.15 hrs Surf.Area= 2,435 sf Storage= 2,453 cf

Plug-Flow detention time= 501.4 min calculated for 7,382 cf (89% of inflow) Center-of-Mass det. time= 445.7 min (1,220.1 - 774.4)

| Volume | Invert | Avail | .Storage | e Storage Descrip | otion | | | |
|------------------|---------------------------|----------------------------------|----------------------------|---|--|---|--|--|
| #1 | 98.25' | | 2,453 c | f Custom Stage | Data (Conic)Listed | below (Recalc) | | |
| Elevatio (fee | Elevation Surf.Area Voids | | Voids (%) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) | | |
| 98.2 | 25 | 1.870 | 0.0 | 0 | 0 | 1,870 | | |
| 99.3 | 25 | 1,870 | 35.0 | 655 | 655 | 2,023 | | |
| 99. | 50 | 1,870 | 25.0 | 117 | 771 | 2,062 | | |
| 100. | 00 | 2,435 | 100.0 | 1,073 | 1,845 | 2,633 | | |
| 100.2 | 25 | 2,435 | 100.0 | 609 | 2,453 | 2,676 | | |
| Device | Routing | ١n | vert O | utlet Devices | | | | |
| #1 | Primary | mary 98.15' | | 0" Round Culvert et / Outlet Invert= 9 0.020 Corrugated | L= 11.0' Ke= 0.50 98.15' / 98.09' S= 0 PE, corrugated inte | 0 .0055 '/' Cc= 0.900 erior. Flow Area= 0.09 sf | | |
| #2 | Device 1 | 98. | .15' 0. Lii | 0.5" Vert. Restrictive Orifice C= 0.600 Limited to weir flow at low heads | | | | |
| #3 | Device 2 | 98. | 25' 4. Inl | 0" Round 4" HDP et / Outlet Invert= 9 | E Underdrain L= 20 98.25' / 98.15' S= 0 | 0.0' Ke= 0.500 0.0050 '/' Cc= 0.900 | | |
| #4 | Device 3 | 98. | n= 25' 0. 9 X | 9" x 0.1" Horiz. Pe 3 rows C= 0.600 L | rforations X 400.00 | orior, Flow Area= 0.09 st) columns at low heads | | |
| #5 | Device 1 | 100. | .00' 4. | 0" Horiz. Draintech | n Atrium C= 0.600 | | | |
| #6 | Secondary | 100.00° 2 L 100.10' 3 F | | D' long x 2.0' brea ead (feet) 0.20 0.4 50 3.00 3.50 bef. (English) 2.54 85 3.07 3.20 3.32 | Owneads dth Broad-Crested 0 0.60 0.80 1.00 2.61 2.61 2.60 2. | Rectangular Weir 1.20 1.40 1.60 1.80 2.00 66 2.70 2.77 2.89 2.88 | | |

Primary OutFlow Max=0.30 cfs @ 12.15 hrs HW=100.47' (Free Discharge) 1=Culvert (Passes 0.30 cfs of 0.45 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.30 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.35 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.38 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.29 cfs @ 3.31 fps)

Secondary OutFlow Max=1.77 cfs @ 12.15 hrs HW=100.47' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 1.77 cfs @ 1.58 fps)



Pond 7P: Proposed Rain Garden 4 (North)

Summary for Pond 8P: Underground Storage w/ Porous Pavement 4

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | 97,166 sf | , 80.96% Impervious, | Inflow Depth > 4.40 | for 10-Year _Current event |
|---------------|-------------|----------------------|-----------------------|----------------------------|
| Inflow = | 10.05 cfs @ | 12.15 hrs, Volume= | 35,655 cf | |
| Outflow = | 0.02 cfs @ | 24.74 hrs, Volume= | 3,782 cf, Att | en= 100%, Lag= 755.1 min |
| Primary = | 0.02 cfs @ | 24.74 hrs, Volume= | 3,782 cf | |
| Secondary = | 0.00 cfs @ | 0.00 hrs, Volume= | 0 cf | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 97.66' @ 24.74 hrs Surf.Area= 33,612 sf Storage= 33,144 cf

Plug-Flow detention time= 1,862.2 min calculated for 3,780 cf (11% of inflow) Center-of-Mass det. time= 1,421.4 min (2,273.5 - 852.1)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 9,112 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 15,592 cf | 63.25'W x 281.30'L x 3.50'H Field A |
| | | | 62,272 cf Overall - 23,292 cf Embedded = 38,980 cf x 40.0% Voids |
| #3A | 96.17' | 23,292 cf | ADS_StormTech SC-740 +Cap x 507 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 507 Chambers in 13 Rows |
| | | 47 006 of | Total Available Storage |

47,996 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void %) | s Inc.Store) (cubic-feet) | Cum.Store (cubic-feet) | | | |
|------------------|-----------|----------------------|--|-----------------------------------|---------------------------|---|--|--|
| 96.1 | 17 | 15,820 | 0. |) 0 | 0 | | | |
| 97.6 | 67 | 15,820 | 35. |) 8,306 | 8,306 | | | |
| 97.8 | 33 | 15,820 | 15. |) 380 | 8,685 | | | |
| 98.0 | 01 | 15,820 | 15. |) 427 | 9,112 | | | |
| Device | Routing | In | vert | Outlet Devices | | | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restriction | Orifice C= 0.600 | 1 | | |
| | - | | | Limited to weir flow at low heads | | | | |
| #2 | Device 1 | 92 | 92.17' 6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 | | | | | |
| | | | | Inlet / Outlet Invert= 92. | 17' / 90.37' S= 0 | 0.0050 '/' Cc= 0.900 | | |
| | | | | n= 0.020 Corrugated P | E, corrugated inte | erior, Flow Area= 0.20 sf | | |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. Perfe | orations X 400.00 |) columns | | |
| | - · | | | X 3 rows C= 0.600 Lin | nited to weir flow a | at low heads | | |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' breadt | h Broad-Crested | Rectangular Weir | | |
| | | | | Head (feet) 0.20 0.40 | 0.60 0.80 1.00 | 1.20 1.40 1.60 1.80 2.00 | | |
| | | | | 2.50 3.00 3.50 | | ~ | | |
| | | | | Coet. (English) 2.54 2 | .61 2.61 2.60 2. | 66 2.70 2.77 2.89 2.88 | | |
| | | | | 2.85 3.07 3.20 3.32 | | | | |

Primary OutFlow Max=0.02 cfs @ 24.74 hrs HW=97.66' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 11.37 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.45 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 8.46 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 8P: Underground Storage w/ Porous Pavement 4 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

39 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 279.30' Row Length +12.0" End Stone x 2 = 281.30' Base Length
13 Rows x 51.0" Wide + 6.0" Spacing x 12 + 12.0" Side Stone x 2 = 63.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

507 Chambers x 45.9 cf = 23,291.6 cf Chamber Storage

62,272.0 cf Field - 23,291.6 cf Chambers = 38,980.5 cf Stone x 40.0% Voids = 15,592.2 cf Stone Storage

Chamber Storage + Stone Storage = 38,883.8 cf = 0.893 af Overall Storage Efficiency = 62.4% Overall System Size = 281.30' x 63.25' x 3.50'

507 Chambers 2,306.4 cy Field 1,443.7 cy Stone



Pond 8P: Underground Storage w/ Porous Pavement 4

Summary for Pond 9P: Proposed Rain Garden 3 (North East)

[93] Warning: Storage range exceeded by 0.21'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

[62] Hint: Exceeded Reach 2R OUTLET depth by 0.13' @ 12.25 hrs

19,898 sf, 48.83% Impervious, Inflow Depth = 3.91" for 10-Year Current event Inflow Area = Inflow = 1.72 cfs @ 12.20 hrs, Volume= 6,480 cf 1.94 cfs @ 12.15 hrs, Volume= 6,343 cf, Atten= 0%, Lag= 0.0 min Outflow = 0.29 cfs @ 12.15 hrs, Volume= Primary 4.379 cf = Routed to Pond 10P : Underground Storage w/ Porous Pavement 5 Secondary = 1.65 cfs @ 12.15 hrs, Volume= 1,964 cf Routed to Pond 10P : Underground Storage w/ Porous Pavement 5

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.46' @ 12.15 hrs Surf.Area= 1,670 sf Storage= 1,751 cf

Plug-Flow detention time= 438.8 min calculated for 6,343 cf (98% of inflow) Center-of-Mass det. time= 425.3 min (1,209.5 - 784.1)

| Volume | Invert | Avail.Storage | | ige Storage Descri | iption | | | |
|----------|-----------|-----------------------------------|-------|---|---|---|--|--|
| #1 | 98.25' | | 1,751 | cf Custom Stage | e Data (Conic)Liste | d below (Recalc) | | |
| Elevatio | on Su | rf.Area | Voids | Inc.Store | Cum.Store | Wet.Area | | |
| (fee | et) | (sq-ft) | (%) | (cubic-feet) | (cubic-feet) | <u>(sq-ft)</u> | | |
| 98.2 | 25 | 1,385 | 0.0 | 0 | 0 | 1,385 | | |
| 99.2 | 25 | 1,385 | 35.0 | 485 | 485 | 1,517 | | |
| 99. | 50 | 1,385 | 25.0 | 87 | 571 | 1,550 | | |
| 100.0 | 00 | 1,670 | 100.0 | 763 | 1,334 | 1,843 | | |
| 100.2 | 25 | 1,670 | 100.0 | 418 | 1,751 | 1,879 | | |
| Device | Routing | Inv | /ert | Outlet Devices | | | | |
| #1 | Primary | Primary 98.15' | | 4.0" Round Culvert L= 11.0' Ke= 0.500 Inlet / Outlet Invert= 98.15' / 98.09' S= 0.0055 '/' Cc= 0.900 n= 0.020. Corrugated PE corrugated interior. Flow Area= 0.09 sf | | | | |
| #2 | Device 1 | 98. | .15' | 0.5" Vert. Restrictive Orifice C= 0.600 Limited to weir flow at low heads | | | | |
| #3 | Device 2 | 98. | .25' | 4.0" Round 4" HDF Inlet / Outlet Invert= | PE Underdrain L= 98.25' / 98.15' S= d PE_corrugated in | 20.0' Ke= 0.500 0.0050 '/' Cc= 0.900 aterior Elow Area= 0.09 sf | | |
| #4 | Device 3 | 98. | .25' | 0.9" x 0.1" Horiz. P X 3 rows C= 0.600 | erforations X 400.0 Limited to weir flow | 00 columns / at low heads | | |
| #5 | Device 1 | 100. | .00' | 4.0" Horiz. Drainted | ch Atrium C= 0.60 | 00 | | |
| #6 | Secondary | /ice 1 100.00' condary 100.10' | | Limited to weir flow a 3.0' long x 2.0' bre Head (feet) 0.20 0. 2.50 3.00 3.50 Coef. (English) 2.54 2.85 3.07 3.20 3.3 | at low heads adth Broad-Creste 40 0.60 0.80 1.00 4 2.61 2.61 2.60 2 2 | ed Rectangular Weir 1.20 1.40 1.60 1.80 2.00 2.66 2.70 2.77 2.89 2.88 | | |

| Site1HillsboroughMunicpComplex_2024062NOAA 24-hr C 10-Year | _Current Rainfall=5.16" |
|---|-------------------------|
| Prepared by Rutgers Cooperative Extension Water Resources Program | Printed 6/29/2024 |
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Primary OutFlow Max=0.29 cfs @ 12.15 hrs HW=100.46' (Free Discharge) 1=Culvert (Passes 0.29 cfs of 0.44 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.28 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.35 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.36 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.28 cfs @ 3.25 fps)

Secondary OutFlow Max=1.65 cfs @ 12.15 hrs HW=100.46' (Free Discharge) G=Broad-Crested Rectangular Weir (Weir Controls 1.65 cfs @ 1.55 fps)



Pond 9P: Proposed Rain Garden 3 (North East)

Summary for Pond 10P: Underground Storage w/ Porous Pavement 5

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area | = | 78,061 sf, | , 72.85% Imper | vious, Inflov | v Depth > | 4.31" | for 10- | Year | Current event |
|-------------|---|------------|----------------|---------------|-----------|----------|---------|-------|---------------|
| Inflow = | = | 7.36 cfs @ | 12.17 hrs, Vol | ume= | 28,054 c | f | | | |
| Outflow = | = | 0.02 cfs @ | 24.51 hrs, Vol | ume= | 3,806 c | f, Atten | = 100% | , Lag | = 740.8 min |
| Primary = | = | 0.02 cfs @ | 24.51 hrs, Vol | ume= | 3,806 c | f | | - | |
| Secondary = | = | 0.00 cfs @ | 0.00 hrs, Vol | ume= | 0 c | f | | | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 97.77' @ 24.51 hrs Surf.Area= 27,852 sf Storage= 25,689 cf

Plug-Flow detention time= 1,802.2 min calculated for 3,804 cf (14% of inflow) Center-of-Mass det. time= 1,409.6 min (2,273.6 - 864.0)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 9,426 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 10,110 cf | 63.25'W x 181.62'L x 3.50'H Field A |
| | | | 40,205 cf Overall - 14,931 cf Embedded = 25,275 cf x 40.0% Voids |
| #3A | 96.17' | 14,931 cf | ADS_StormTech SC-740 +Cap x 325 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 325 Chambers in 13 Rows |
| | | 24 467 of | Total Available Starage |

34,467 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void (% | ls Inc.Store | Cum.Store (cubic-feet) | |
|------------------|-----------|----------------------|------------|------------------------|---------------------------|------------------------------|
| 96.1 | 17 | 16,365 | 0. | 0 0 | 0 | |
| 97.6 | 67 | 16,365 | 35. | 0 8,592 | 8,592 | |
| 97.8 | 33 | 16,365 | 15. | 0 393 | 8,984 | |
| 98.0 |)1 | 16,365 | 15. | 0 442 | 9,426 | |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | on Orifice C= 0. | 600 |
| | - | | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | PE Underdrain L | = 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | = 92.17' / 90.37' S | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. F | Perforations X 40 | 0.00 columns |
| | | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bre | eadth Broad-Cres | ted Rectangular Weir |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | | |
| | | | | Coef. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3.3 | 32 | |

Primary OutFlow Max=0.02 cfs @ 24.51 hrs HW=97.77' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 11.47 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.45 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 8.54 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 10P: Underground Storage w/ Porous Pavement 5 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

25 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 179.62' Row Length +12.0" End Stone x 2 = 181.62' Base Length 13 Rows x 51.0" Wide + 6.0" Spacing x 12 + 12.0" Side Stone x 2 = 63.25' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

325 Chambers x 45.9 cf = 14,930.5 cf Chamber Storage

40,205.4 cf Field - 14,930.5 cf Chambers = 25,274.9 cf Stone x 40.0% Voids = 10,110.0 cf Stone Storage

Chamber Storage + Stone Storage = 25,040.5 cf = 0.575 af Overall Storage Efficiency = 62.3% Overall System Size = 181.62' x 63.25' x 3.50'

325 Chambers 1,489.1 cy Field 936.1 cy Stone



Pond 10P: Underground Storage w/ Porous Pavement 5

Summary for Pond 11P: Proposed Rain Garden 2 (East)

[93] Warning: Storage range exceeded by 0.36'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)

Inflow Area = 32,033 sf, 45.19% Impervious, Inflow Depth = 3.84" for 10-Year Current event 2.57 cfs @ 12.22 hrs, Volume= Inflow = 10,240 cf 3.12 cfs @ 12.21 hrs, Volume= 0.35 cfs @ 12.21 hrs, Volume= = Outflow 10,016 cf, Atten= 0%, Lag= 0.0 min Primarv = 6.837 cf Routed to Pond 12P : Underground Storage w/ Porous Pavement 6 2.77 cfs @ 12.21 hrs, Volume= Secondary = 3,180 cf Routed to Pond 12P : Underground Storage w/ Porous Pavement 6

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.61' @ 12.21 hrs Surf.Area= 3,045 sf Storage= 3,267 cf

Plug-Flow detention time= 521.5 min calculated for 10,016 cf (98% of inflow) Center-of-Mass det. time= 507.8 min (1,296.2 - 788.5)

| Volume | Invert | Avai | I.Stor | age Storage Descr | iption | |
|--|----------------------------|---|----------------------------------|---|---|---|
| #1 | 98.25' | | 3,26 | 7 cf Custom Stage | e Data (Conic)Listed | below (Recalc) |
| Elevatio (fee | on Su et) | rf.Area (sq-ft) | Void (% | s Inc.Store) (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
| 98.2 99.2 99.5 100.0 100.2 | 25 25 50 00 25 | 2,635 2,635 2,635 3,045 3,045 | 0. 35. 25. 100. 100. | 0 0 0 922 0 165 0 1,419 0 761 | 0 922 1,087 2,506 3,267 | 2,635 2,817 2,862 3,283 3,332 |
| Device | Routing | ١n | vert | Outlet Devices | | |
| #1 | Primary | 98. | .15' | 4.0" Round Culver Inlet / Outlet Invert= n= 0.020 Corrugate | rt L= 11.0' Ke= 0.50 98.15' / 98.09' S= 0 ed PE_corrugated inte | 00).0055 '/' Cc= 0.900 erior Flow Area= 0.09 sf |
| #2 | Device 1 | 98. | .15' | 0.7" Vert. Restrictive Orifice C= 0.600 | | |
| #3 | Device 2 | 98. | .25' | 4.0" Round 4" HDPE Underdrain L= 20.0' Ke Inlet / Outlet Invert= 98.25' / 98.15' S= 0.0050 '/' n= 0.020 Corrugated PE corrugated interior El | | 0.0' Ke= 0.500).0050 '/' Cc= 0.900 erior. Flow Area= 0.09 sf |
| #4 | Device 3 | 98. | .25' | 0.9" x 0.1" Horiz. P X 3 rows C= 0 600 | erforations X 400.00 | o columns at low heads |
| #5 | Device 1 | 100. | .00' | 4.0" Horiz. Draintech Atrium C= 0.600 | |) |
| #6 | Secondary | 100. | .10' | 3.0' long x 2.0' bre Head (feet) 0.20 0 2.50 3.00 3.50 Coef. (English) 2.54 2.85 3.07 3.20 3.3 | adth Broad-Crestec 40 0.60 0.80 1.00 4 2.61 2.61 2.60 2. | Rectangular Weir 1.20 1.40 1.60 1.80 2.00 66 2.70 2.77 2.89 2.88 |

| Site1HillsboroughMunicpComplex_2024062NOAA 24-hr C 10-Year | _Current Rainfall=5.16" |
|---|-------------------------|
| Prepared by Rutgers Cooperative Extension Water Resources Program | Printed 6/29/2024 |
| HydroCAD® 10.10-7c s/n 03601 © 2022 HydroCAD Software Solutions LLC | Page 251 |

Primary OutFlow Max=0.33 cfs @ 12.21 hrs HW=100.56' (Free Discharge) 1=Culvert (Passes 0.33 cfs of 0.46 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.02 cfs @ 7.42 fps) 3=4" HDPE Underdrain (Passes 0.02 cfs of 0.36 cfs potential flow) 4=Perforations (Passes 0.02 cfs of 5.48 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.31 cfs @ 3.59 fps)

Secondary OutFlow Max=2.48 cfs @ 12.21 hrs HW=100.56' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 2.48 cfs @ 1.78 fps)



Pond 11P: Proposed Rain Garden 2 (East)

Summary for Pond 12P: Underground Storage w/ Porous Pavement 6

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area = | | 32,033 sf, | 45.19% In | npervious, | Inflow Depth > | 3.75" | for 10-Y | ear _Current | event |
|---------------|---|------------|------------|------------|----------------|----------|----------|--------------|-------|
| Inflow = | 3 | 3.12 cfs @ | 12.21 hrs, | Volume= | 10,016 c | f | | | |
| Outflow = | (|).01 cfs @ | 48.23 hrs, | Volume= | 3,435 c | f, Atten | = 100%, | Lag= 2,161.1 | l min |
| Primary = | (|).01 cfs @ | 48.23 hrs, | Volume= | 3,435 c | f | | | |
| Secondary = | (|).00 cfs @ | 0.00 hrs, | Volume= | 0 c | f | | | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 97.29' @ 48.23 hrs Surf.Area= 8,364 sf Storage= 6,911 cf

Plug-Flow detention time= 1,676.0 min calculated for 3,433 cf (34% of inflow) Center-of-Mass det. time= 1,103.0 min (2,399.2 - 1,296.2)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|---|
| #1 | 96.17' | 1,866 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 4,603 cf | 25.25'W x 202.98'L x 3.50'H Field A |
| | | | 17,938 cf Overall - 6,432 cf Embedded = 11,506 cf x 40.0% Voids |
| #3A | 96.17' | 6,432 cf | ADS_StormTech SC-740 +Cap x 140 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 140 Chambers in 5 Rows |
| | | 12 000 of | Total Available Storage |

12,900 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void %) | ls Inc.Store | Cum.Store (cubic-feet) | |
|------------------|-----------|----------------------|------------|------------------------|---------------------------|------------------------------|
| 96.1 | 17 | 3,239 | 0. | 0 0 | 0 | |
| 97.6 | 67 | 3,239 | 35. | 0 1,700 | 1,700 | |
| 97.8 | 33 | 3,239 | 15. | 0 78 | 1,778 | |
| 98.0 | 01 | 3,239 | 15. | 0 87 | 1,866 | |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | ion Orifice C= 0. | 600 |
| | | | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | PE Underdrain L | = 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | = 92.17' / 90.37' S | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. F | Perforations X 40 | 0.00 columns |
| | | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bro | eadth Broad-Cres | ted Rectangular Weir |
| | | | | Head (feet) 0.20 0 | 0.40 0.60 0.80 1.0 | 00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | 4 0 04 0 04 0 00 | |
| | | | | Coer. (English) 2.5 | 4 2.01 2.01 2.00 | 2.00 2.10 2.11 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3. | 3Z | |
Primary OutFlow Max=0.01 cfs @ 48.23 hrs HW=97.29' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.01 cfs @ 10.98 fps) 2=6" HDPE Underdrain (Passes 0.01 cfs of 0.43 cfs potential flow) 3=Perforations (Passes 0.01 cfs of 8.17 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.67' (Free Discharge) 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 12P: Underground Storage w/ Porous Pavement 6 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

28 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 200.98' Row Length +12.0" End Stone x 2 = 202.98' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

140 Chambers x 45.9 cf = 6,431.6 cf Chamber Storage

17,938.1 cf Field - 6,431.6 cf Chambers = 11,506.5 cf Stone x 40.0% Voids = 4,602.6 cf Stone Storage

Chamber Storage + Stone Storage = 11,034.2 cf = 0.253 af Overall Storage Efficiency = 61.5% Overall System Size = 202.98' x 25.25' x 3.50'

140 Chambers 664.4 cy Field 426.2 cy Stone



Pond 12P: Underground Storage w/ Porous Pavement 6

Summary for Link 1L: Offsite Flows

| Inflow / | Area = | 927,363 sf, 3.35% Impervie | ous, Inflow Depth = | 2.56" for 10-Year_C | urrent event |
|----------|--------|------------------------------|---------------------|---------------------|--------------|
| Inflow | = | 38.69 cfs @ 12.32 hrs, Volun | ne= 198,077 cf | | |
| Primar | y = | 38.69 cfs @ 12.32 hrs, Volun | ne= 198,077 cf | Atten= 0%, Lag= 0.0 | min |

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 1L: Offsite Flows



| Site1HillsboroughMunicpComplex_2024062NOAA 24-hr C 100-Year | _2100 Rainfall=12.15" |
|---|-----------------------|
| Prepared by Rutgers Cooperative Extension Water Resources Program | Printed 6/29/2024 |
| HydroCAD® 10.10-7c s/n 03601 © 2022 HydroCAD Software Solutions LLC | Page 257 |

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| Subcatchment1S: DA1: CN w/ IC | Runoff Area=56,173 sf 73.47% Impervious Runoff Depth=11.11" Flow Length=361' Tc=14.3 min CN=75/98 Runoff=12.23 cfs 52,009 cf |
|------------------------------------|--|
| Subcatchment 1Sa: Existing RG 1_\ | Nest_ Runoff Area=22,637 sf 64.43% Impervious Runoff Depth=10.94" Flow Length=361' Tc=14.3 min CN=77/98 Runoff=4.90 cfs 20,633 cf |
| Subcatchment1Sb: DA1: CN w/ IC | Runoff Area=39,105 sf 68.25% Impervious Runoff Depth=10.95" Flow Length=361' Tc=14.3 min CN=75/98 Runoff=8.45 cfs 35,694 cf |
| Subcatchment2S: DA 2: CN w/ IC a | reas Runoff Area=58,249 sf 86.46% Impervious Runoff Depth=11.52" Flow Length=391' Tc=7.0 min CN=76/98 Runoff=16.21 cfs 55,920 cf |
| Subcatchment3S: DA 3: CN w/ IC | Runoff Area=158,623 sf 63.48% Impervious Runoff Depth=10.86" Flow Length=441' Tc=8.3 min CN=76/98 Runoff=41.14 cfs 143,567 cf |
| Subcatchment3Sa: Existing RG 2 F | ront Runoff Area=25,889 sf 48.62% Impervious Runoff Depth=10.65" Tc=8.3 min CN=79/98 Runoff=6.68 cfs 22,972 cf |
| Subcatchment3Sb: RG 1 DA | Runoff Area=21,388 sf 65.14% Impervious Runoff Depth=10.81" Flow Length=441' Tc=8.3 min CN=74/98 Runoff=5.52 cfs 19,268 cf |
| Subcatchment3Sc: DA 3: CN w/ IC | areas Runoff Area=111,346 sf 66.62% Impervious Runoff Depth=10.90" Flow Length=441' Tc=8.3 min CN=75/98 Runoff=28.90 cfs 101,179 cf |
| Subcatchment4S: DA 4: CN w/ IC | Runoff Area=86,816 sf 90.62% Impervious Runoff Depth=11.63" Flow Length=143' Tc=8.4 min CN=75/98 Runoff=23.20 cfs 84,111 cf |
| Subcatchment4Sa: RG 4 DA | Runoff Area=24,369 sf 57.53% Impervious Runoff Depth=10.87" Flow Length=143' Tc=8.4 min CN=79/98 Runoff=6.32 cfs 22,067 cf |
| Subcatchment4Sb: DA 4: CN w/ IC | areas Runoff Area=72,797 sf 88.81% Impervious Runoff Depth=11.57" Flow Length=143' Tc=8.4 min CN=75/98 Runoff=19.41 cfs 70,199 cf |
| Subcatchment5S: DA 5: CN w/ IC | Runoff Area=78,058 sf 72.85% Impervious Runoff Depth=11.17" Flow Length=310' Tc=11.5 min CN=77/98 Runoff=18.43 cfs 72,643 cf |
| Subcatchment5Sa: RG 3 DA | Runoff Area=19,898 sf 48.83% Impervious Runoff Depth=10.65" Flow Length=310' Tc=11.5 min CN=79/98 Runoff=4.60 cfs 17,665 cf |
| Subcatchment5Sb: DA 5: CN w/ IC | areas Runoff Area=58,163 sf 81.07% Impervious Runoff Depth=11.34" Flow Length=310' Tc=11.5 min CN=75/98 Runoff=13.82 cfs 54,959 cf |
| Subcatchment6S: DA 6: CN w/ IC a | reas Runoff Area=32,033 sf 45.19% Impervious Runoff Depth=10.56" Flow Length=276' Tc=14.0 min CN=79/98 Runoff=6.91 cfs 28,199 cf |
| Subcatchment 7S: DA 7 (Offsite Sou | uth): Runoff Area=107,001 sf 18.84% Impervious Runoff Depth=9.81" Flow Length=309' Tc=14.5 min CN=78/98 Runoff=21.82 cfs 87,434 cf |

Subcatchment 8S: DA 8 (Offsite North): CN Runoff Area=340,642 sf 1.94% Impervious Runoff Depth=8.82" Flow Length=976' Tc=19.4 min CN=74/98 Runoff=57.48 cfs 250,371 cf Runoff Area=479,720 sf 0.89% Impervious Runoff Depth=8.65" Subcatchment9S: DA 9 (Offsite Field Flow Length=1,468' Tc=30.4 min CN=73/98 Runoff=64.44 cfs 345,655 cf Runoff Area=32,035 sf 32.46% Impervious Runoff Depth=10.25" Subcatchment 31S: RG 2 DA Flow Length=276' Tc=14.0 min CN=79/98 Runoff=6.82 cfs 27,367 cf Avg. Flow Depth=0.40' Max Vel=2.89 fps Inflow=4.90 cfs 20,633 cf Reach 1R: Existing Bioswale West 1 n=0.035 L=33.0' S=0.0227 '/' Capacity=7.36 cfs Outflow=4.87 cfs 20,633 cf Avg. Flow Depth=0.53' Max Vel=3.32 fps Inflow=4.60 cfs 17,665 cf Reach 2R: Bioswale E 1 RG 3 n=0.035 L=35.0' S=0.0286 '/' Capacity=4.02 cfs Outflow=4.58 cfs 17,665 cf Pond 1P: Exising Rain Garden 1 West Peak Elev=100.79' Storage=1,831 cf Inflow=4.87 cfs 20,633 cf Primary=0.38 cfs 9,492 cf Secondary=4.50 cfs 10,957 cf Outflow=4.88 cfs 20,449 cf Pond 2P: Underground Storage w/ Porous Peak Elev=99.11' Storage=24,498 cf Inflow=13.29 cfs 56,143 cf Primary=0.02 cfs 3,953 cf Secondary=9.41 cfs 34,699 cf Outflow=9.43 cfs 38,652 cf Pond 3P: Underground Storage w/ Porous Peak Elev=99.21' Storage=27,931 cf Inflow=16.21 cfs 55,920 cf Primary=0.02 cfs 3,964 cf Secondary=10.69 cfs 31,648 cf Outflow=10.70 cfs 35,612 cf Peak Elev=101.97' Storage=3,267 cf Inflow=6.68 cfs 22,972 cf Pond 4P: Existing Rain Garden 2 Front Primary=0.42 cfs 9,281 cf Secondary=6.37 cfs 12,536 cf Outflow=6.79 cfs 21,818 cf Pond 5P: Proposed Rain Garden 1 (South Peak Elev=101.87' Storage=2,466 cf Inflow=5.52 cfs 19,268 cf Primary=0.40 cfs 8,765 cf Secondary=5.27 cfs 9,935 cf Outflow=5.67 cfs 18,700 cf Peak Elev=100.26' Storage=71,344 cf Inflow=41.36 cfs 141,696 cf Pond 6P: Underground Storage w/ Primary=0.02 cfs 3,985 cf Secondary=30.16 cfs 83,445 cf Outflow=30.18 cfs 87,430 cf Pond 7P: Proposed Rain Garden 4 (North) Peak Elev=100.92' Storage=2,453 cf Inflow=6.32 cfs 22,067 cf Primary=0.41 cfs 9,513 cf Secondary=5.85 cfs 11,723 cf Outflow=6.26 cfs 21,237 cf Pond 8P: Underground Storage w/ Porous Peak Elev=99.23' Storage=47,996 cf Inflow=25.67 cfs 91,436 cf Primary=0.02 cfs 3,983 cf Secondary=11.09 cfs 50,531 cf Outflow=11.11 cfs 54,513 cf Pond 9P: Proposed Rain Garden 3 (North Peak Elev=100.77' Storage=1,751 cf Inflow=4.58 cfs 17,665 cf Primary=0.38 cfs 8,484 cf Secondary=4.26 cfs 9,037 cf Outflow=4.64 cfs 17,521 cf Pond 10P: Underground Storage w/ Peak Elev=99.42' Storage=34,467 cf Inflow=18.45 cfs 72,480 cf Primary=0.02 cfs 3,976 cf Secondary=14.16 cfs 41,807 cf Outflow=14.17 cfs 45,783 cf Pond 11P: Proposed Rain Garden 2 (East) Peak Elev=100.98' Storage=3,267 cf Inflow=6.91 cfs 28,199 cf Primary=0.44 cfs 11.675 cf Secondary=6.48 cfs 16.284 cf Outflow=6.91 cfs 27.959 cf Pond 12P: Underground Storage w/ Porous Peak Elev=98.56' Storage=11,644 cf Inflow=6.91 cfs 27.959 cf Primary=0.02 cfs 3,804 cf Secondary=3.29 cfs 14,500 cf Outflow=3.31 cfs 18,304 cf

> Inflow=132.65 cfs 683,460 cf Primary=132.65 cfs 683,460 cf

Link 1L: Offsite Flows

Total Runoff Area = 1,824,942 sf Runoff Volume = 1,511,912 cf Average Runoff Depth = 9.94" 63.76% Pervious = 1,163,653 sf 36.24% Impervious = 661,289 sf

Summary for Subcatchment 1S: DA1: CN w/ IC areas_original

Runoff = 12.23 cfs @ 12.22 hrs, Volume= 52,009 cf, Depth=11.11"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

| | A | rea (sf) | CN | Description | | |
|---|-------|----------|---------|-------------|--------------|--|
| * | | 2,053 | 79 | Open space | e (fair) C | |
| * | | 12,848 | 74 | Open space | e (good) C | |
| * | | 41,272 | 98 | Impervious | (0) | |
| | | 56,173 | 92 | Weighted A | verage | |
| | | 14,901 | 75 | 26.53% Pei | rvious Area | |
| | | 41,272 | 98 | 73.47% Imp | pervious Are | ea |
| | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | |
| | 12.2 | 100 | 0.0109 | 0.14 | | Sheet Flow, Sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 0.2 | 33 | 0.0280 | 2.69 | | Shallow Concentrated Flow, SCF - unpaved |
| | | | | | | Unpaved Kv= 16.1 fps |
| | 1.9 | 228 | 0.0095 | 1.98 | | Shallow Concentrated Flow, SCF - Paved parking lot |
| | | | | | | Paved Kv= 20.3 fps |
| | 14.3 | 361 | Total | | | |

Subcatchment 1S: DA1: CN w/ IC areas_original



Summary for Subcatchment 1Sa: Existing RG 1_West_ DA

Runoff = 4.90 cfs @ 12.22 hrs, Volume= Routed to Reach 1R : Existing Bioswale West 1 20,633 cf, Depth=10.94"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year 2100 Rainfall=12.15"

| _ | A | rea (sf) | CN | Description | | |
|---|---------------------------------|----------|-----------|--------------------|----------------|---|
| * | | 5,569 | 79 | Open space | e (fair) C - F | Portion from DA 9 the field |
| * | | 14,584 | 98 | Impervious | Parking Lo | t |
| * | | 2,484 | 74 | OPen Spac | e (Good) C | - Portion from DA1 |
| _ | | 22,637 | 91 | Weighted A | verage | |
| | | 8,053 | 77 | 35.57% Pei | rvious Area | |
| | 14,584 98 64.43% Impervious Are | | | | | ea |
| | Tc (min) | Length | Slope | Velocity | Capacity | Description |
| _ | 12.2 | 100 | 0.0100 | $\frac{10300}{14}$ | (013) | Shoot Flow, Shoot flow |
| | 12.2 | 100 | 0.0108 | 0.14 | | Grass: Short $n= 0.150$ P2= 3.34" |
| | 0.2 | 33 | 0.0280 | 2.69 | | Shallow Concentrated Flow, SCF - unpaved |
| | 10 | 228 | | 1.08 | | Unpaved KV= 16.1 fps Shallow Concentrated Flow SCE Paved parking let |
| | 1.9 | 220 | 0.0090 | 1.90 | | Paved Kv= 20.3 fps |
| | 440 | 0.04 | T . 4 . 1 | | | |

14.3 361 Total

Subcatchment 1Sa: Existing RG 1_West_ DA



Summary for Subcatchment 1Sb: DA1: CN w/ IC areas_Remaining

Runoff = 8.45 cfs @ 12.22 hrs, Volume= 35,694 cf, Depth=10.95" Routed to Pond 2P : Underground Storage w/ Porous Pavement 1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

| _ | A | rea (sf) | CN I | Description | | |
|-----------------------------|-------|----------|-----------|-------------|-------------|--|
| * | | 2,053 | 79 | Open space | e (fair) C | |
| * | | 10,364 | 74 (| Open space | e (good) C | |
| * | | 26,688 | 98 | mpervious | , | |
| _ | | 39,105 | 91 | Weighted A | verage | |
| | | 12,417 | 75 3 | 31.75% Pei | vious Area | |
| 26,688 98 68.25% Impervious | | | | 68.25% Imp | pervious Ar | ea |
| | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description |
| _ | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | |
| | 12.2 | 100 | 0.0109 | 0.14 | | Sheet Flow, Sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 0.2 | 33 | 0.0280 | 2.69 | | Shallow Concentrated Flow, SCF - unpaved |
| | | | | | | Unpaved Kv= 16.1 fps |
| | 1.9 | 228 | 0.0095 | 1.98 | | Shallow Concentrated Flow, SCF - Paved parking lot |
| | | | | | | Paved Kv= 20.3 fps |
| | 44.0 | 0.04 | T . 4 . 1 | | | |

14.3 361 Total

Subcatchment 1Sb: DA1: CN w/ IC areas_Remaining



Summary for Subcatchment 2S: DA 2: CN w/ IC areas

Runoff = 16.21 cfs @ 12.14 hrs, Volume= 55,920 cf, Depth=11.52" Routed to Pond 3P : Underground Storage w/ Porous Pavement 2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

| | A | rea (sf) | CN | Description | | |
|----------------------------------|-------|----------|--------|-------------|--------------|--|
| * | | 3,767 | 79 | Open space | e (Fair) C | |
| * | | 4,118 | 74 | Open Spac | e (good) C | |
| * | | 50,364 | 98 | Impervious | , | |
| | | 58,249 | 95 | Weighted A | verage | |
| 7,885 76 13.54% Pervious Area | | | | 13.54% Pe | rvious Area | |
| 50,364 98 86.46% Impervious Area | | | | 86.46% Im | pervious Are | ea |
| | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft | t) (ft/sec) | (cfs) | |
| | 4.8 | 18 | 0.003 | 7 0.06 | | Sheet Flow, Sheet flow - grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 2.2 | 373 | 0.018 | 6 2.77 | | Shallow Concentrated Flow, SCF _ paved |
| | | | | | | Paved Kv= 20.3 fps |
| | 7.0 | 391 | Total | | | |

Subcatchment 2S: DA 2: CN w/ IC areas



Summary for Subcatchment 3S: DA 3: CN w/ IC areas_Original

Runoff = 41.14 cfs @ 12.15 hrs, Volume= 143,567 cf, Depth=10.86"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

| _ | A | rea (sf) | CN | Description | | | |
|-----------------------------|------------|----------|--------|----------------------|-------------|--|--|
| * | | 18,715 | 79 | Open space | e (Fair) C | | |
| * | | 39,208 | 74 | Open space | e (good) C | | |
| * | 1 | 00,700 | 98 | Impervious | (0) | | |
| 158.623 90 Weighted Average | | | | Weighted A | verage | | |
| | | 57,923 | 76 | 36.52% Pervious Area | | | |
| | 100,700 98 | | 98 | 63.48% Imp | pervious Ar | ea | |
| | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | |
| _ | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | |
| | 5.8 | 83 | 0.0489 | 0.24 | | Sheet Flow, sheet flow - grass | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | |
| | 2.5 | 358 | 0.0138 | 3 2.38 | | Shallow Concentrated Flow, SCF - paved | |
| | | | | | | Paved Kv= 20.3 fps | |
| _ | 8.3 | 441 | Total | | | | |

Subcatchment 3S: DA 3: CN w/ IC areas_Original



Summary for Subcatchment 3Sa: Existing RG 2 Front DA

Runoff = 6.68 cfs @ 12.15 hrs, Volume= 22,972 cf, Depth=10.65" Routed to Pond 4P : Existing Rain Garden 2 Front

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

| | Area (sf) | CN | Description | | | | |
|----|-------------|------|----------------------------------|--------------------|--|--|--|
| * | 6,507 | 98 | Impervious Roof Top | | | | |
| * | 966 | 98 | Gravel surface, HSG C - Path | | | | |
| * | 5,114 | 98 | Impervious Sidewalk | npervious Sidewalk | | | |
| | 13,302 | 79 |)-75% Grass cover, Fair, HSG C | | | | |
| | 25,889 | 88 | Weighted Average | | | | |
| | 13,302 | 79 | 51.38% Pervious Area | | | | |
| | 12,587 | 98 | 48.62% Impervious Area | | | | |
| | Tc Length | Slop | pe Velocity Capacity Description | | | | |
| (m | nin) (feet) | (ft/ | ft) (ft/sec) (cfs) | | | | |
| 8 | 8.3 | | Direct Entry, | | | | |





Summary for Subcatchment 3Sb: RG 1 DA

Runoff 5.52 cfs @ 12.15 hrs, Volume= 19,268 cf, Depth=10.81" = Routed to Pond 5P : Proposed Rain Garden 1 (South West)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year 2100 Rainfall=12.15"

| | A | rea (sf) | CN | Description | | |
|---|---------------------------------|----------|--------|-------------|-------------|--|
| * | | 7,455 | 74 | Open space | e (good) C | |
| * | | 10,303 | 98 | Impervious | - Roof top | |
| * | | 3,630 | 98 | Impervious | - Road / Si | dewalk |
| | | 21,388 | 90 | Weighted A | verage | |
| | | 7,455 | 74 | 34.86% Pe | rvious Area | |
| | 13,933 98 65.14% Impervious Are | | | | pervious Ar | ea |
| | | | | | | |
| | Tc | Length | Slope | e Velocity | Capacity | Description |
| (| min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | |
| | 5.8 | 83 | 0.048 | 9 0.24 | | Sheet Flow, sheet flow - grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 2.5 | 358 | 0.013 | 3 2.38 | | Shallow Concentrated Flow, SCF - paved |
| | | | | | | Paved Kv= 20.3 fps |
| | 8.3 | 441 | Total | | | |

441 Total

Subcatchment 3Sb: RG 1 DA



Summary for Subcatchment 3Sc: DA 3: CN w/ IC areas Remaining

Runoff = 28.90 cfs @ 12.15 hrs, Volume= 101,179 cf, Depth=10.90" Routed to Pond 6P : Underground Storage w/ Porous Pavement 3

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

| | A | rea (sf) | CN | Description | | |
|----------------------------------|-------|----------|--------|-------------|--------------|--|
| * | | 5,413 | 79 | Open space | e (Fair) C | |
| * | | 31,753 | 74 | Open space | e (good) C | |
| * | | 74,180 | 98 | Impervious | (0) | |
| _ | 1 | 11,346 | 90 | Weighted A | verage | |
| 37.166 75 33.38% Pervious Ar | | | | 33.38% Pe | rvious Area | |
| 74,180 98 66.62% Impervious Area | | | | 66.62% Imp | pervious Are | ea |
| | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description |
| _ | (min) | (feet) | (ft/ft | i) (ft/sec) | (cfs) | |
| | 5.8 | 83 | 0.048 | 9 0.24 | | Sheet Flow, sheet flow - grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 2.5 | 358 | 0.013 | 8 2.38 | | Shallow Concentrated Flow, SCF - paved |
| | | | | | | Paved Kv= 20.3 fps |
| | 8.3 | 441 | Total | | | |

Subcatchment 3Sc: DA 3: CN w/ IC areas Remaining



Summary for Subcatchment 4S: DA 4: CN w/ IC areas_original

Runoff = 23.20 cfs @ 12.15 hrs, Volume= 84,111 cf, Depth=11.63"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

| | A | rea (sf) | CN | Description | | | | | |
|---|-------|----------|--------|---------------------|--------------|--|--|--|--|
| * | | 1,403 | 79 | Open space (fair) C | | | | | |
| * | | 446 | 84 | Open space | e (fair) D | | | | |
| * | | 6,298 | 74 | Open space | e (good) C | | | | |
| * | | 78,669 | 98 | Impervious | | | | | |
| | | 86,816 | 96 | Weighted A | verage | | | | |
| | | 8,147 | 75 | 9.38% Perv | vious Area | | | | |
| | | 78,669 | 98 | 90.62% Imp | pervious Are | ea | | | |
| | | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | |
| | (min) | (feet) | (ft/ft | t) (ft/sec) | (cfs) | | | | |
| | 7.9 | 67 | 0.0144 | 4 0.14 | | Sheet Flow, sheet flow - grass | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| | 0.5 | 76 | 0.015 | 5 2.53 | | Shallow Concentrated Flow, SCF - Paved | | | |
| _ | | | | | | Paved Kv= 20.3 fps | | | |
| | 8.4 | 143 | Total | | | | | | |

Subcatchment 4S: DA 4: CN w/ IC areas_original



Summary for Subcatchment 4Sa: RG 4 DA

Runoff = 6.32 cfs @ 12.15 hrs, Volume= 22,067 cf, Depth=10.87" Routed to Pond 7P : Proposed Rain Garden 4 (North)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

| | A | rea (sf) | CN | Description | | | | | | | |
|----|------------|------------------|-----------------|--------------------------|------------------------------|---|--|--|--|--|--|
| * | | 10,350 | 79 | Open space | pen space (fair) C from DA 8 | | | | | | |
| * | | 14,019 | 98 | Impervious | pervious Parkinglot | | | | | | |
| | | 24,369 | 90 | Weighted A | verage | | | | | | |
| | | 10,350 | 79 | 42.47% Pe | rvious Area | | | | | | |
| | | 14,019 | 98 | 57.53% lmp | pervious Ar | ea | | | | | |
| (1 | Tc min) | Length (feet) | Slope (ft/ft | e Velocity) (ft/sec) | Capacity (cfs) | Description | | | | | |
| | 7.9 | 67 | 0.0144 | 0.14 | | Sheet Flow, sheet flow - grass | | | | | |
| | 0.5 | 76 | 0.0155 | 5 2.53 | | Grass: Short n= 0.150 P2= 3.34" Shallow Concentrated Flow, SCF - Paved Paved Kv= 20.3 fps | | | | | |
| | 8.4 | 143 | Total | | | | | | | | |

Subcatchment 4Sa: RG 4 DA



Summary for Subcatchment 4Sb: DA 4: CN w/ IC areas

Runoff = 19.41 cfs @ 12.15 hrs, Volume= 70,199 cf, Depth=11.57" Routed to Pond 8P : Underground Storage w/ Porous Pavement 4

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

| | A | rea (sf) | CN | Description | | | | | | | | |
|---|-------|----------|--------|-------------|--------------------|--|--|--|--|--|--|--|
| * | | 1,403 | 79 | Open space | e (fair) C | | | | | | | |
| * | | 446 | 84 | Open space | pen space (fair) D | | | | | | | |
| * | | 6,298 | 74 | Open space | pen space (good) C | | | | | | | |
| * | | 64,650 | 98 | Impervious | , | | | | | | | |
| | | 72,797 | 95 | Weighted A | verage | | | | | | | |
| | | 8,147 | 75 | 11.19% Pe | rvious Area | | | | | | | |
| | | 64,650 | 98 | 88.81% Imp | pervious Are | ea | | | | | | |
| | | | | - | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | | | | |
| _ | (min) | (feet) | (ft/ft | t) (ft/sec) | (cfs) | | | | | | | |
| | 7.9 | 67 | 0.0144 | 4 0.14 | | Sheet Flow, sheet flow - grass | | | | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | | | | |
| | 0.5 | 76 | 0.015 | 5 2.53 | | Shallow Concentrated Flow, SCF - Paved | | | | | | |
| _ | | | | | | Paved Kv= 20.3 fps | | | | | | |
| | 8.4 | 143 | Total | | | | | | | | | |

Subcatchment 4Sb: DA 4: CN w/ IC areas



Summary for Subcatchment 5S: DA 5: CN w/ IC areas_Original

Runoff = 18.43 cfs @ 12.19 hrs, Volume= 72,643 cf, Depth=11.17"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

| | A | rea (sf) | CN | Description | | | | | |
|---|----------------------------|-----------|---------|-------------|---------------------|--|--|--|--|
| * | | 11,294 | 79 | Open Spac | open Space (Fair) C | | | | |
| * | | 9,899 | 74 | Open Spac | e (good) C | | | | |
| * | | 56,865 | 98 | Impervious | , | | | | |
| | 78.058 92 Weighted Average | | | | | | | | |
| | | 21,193 | 77 | 27.15% Pei | vious Area | | | | |
| | | 56,865 | 98 | 72.85% Imp | pervious Are | ea | | | |
| | | | | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description | | | |
| _ | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | | | | |
| | 8.7 | 64 | 0.0105 | 0.12 | | Sheet Flow, Sheet flow -grass | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| | 1.3 | 179 0.012 | | 2.31 | | Shallow Concentrated Flow, SCF - paved | | | |
| | | | | | Paved Kv= 20.3 fps | | | | |
| | 1.5 | 67 | 0.0120 | 0.77 | | Shallow Concentrated Flow, SCF _ grass | | | |
| _ | | | | | | Short Grass Pasture Kv= 7.0 fps | | | |
| | 11.5 | 310 | Total | | | | | | |

Subcatchment 5S: DA 5: CN w/ IC areas_Original



Summary for Subcatchment 5Sa: RG 3 DA

Runoff = 4.60 cfs @ 12.19 hrs, Volume= 17,665 cf, Depth=10.65" Routed to Reach 2R : Bioswale E 1 RG 3

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

| _ | A | vrea (sf) | CN | Description | | |
|---|-------|-----------|--------------|-------------|-------------|--|
| * | | 10,182 | 79 | Open Spac | e (Fair) C | |
| * | | 9,716 | 98 | Impervious | Parking lot | |
| | | 19,898 | 88 | Weighted A | verage | |
| | | 10,182 | 79 | 51.17% Pei | rvious Area | |
| | | 9,716 | 98 | 48.83% Imp | pervious Ar | ea |
| | _ | | | | | |
| | Tc | Length | Slope | e Velocity | Capacity | Description |
| _ | (min) | (feet) | (ft/ft) |) (ft/sec) | (cfs) | |
| | 8.7 | 64 | 0.0105 | 0.12 | | Sheet Flow, Sheet flow -grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 1.3 | 179 | 0.0129 | 2.31 | | Shallow Concentrated Flow, SCF - paved |
| | | | | | | Paved Kv= 20.3 fps |
| | 1.5 | 67 | 0.0120 | 0.77 | | Shallow Concentrated Flow, SCF _ grass |
| _ | | | | | | Short Grass Pasture Kv= 7.0 fps |
| | | 0.4.0 | — · · | | | |

11.5 310 Total

Subcatchment 5Sa: RG 3 DA



Summary for Subcatchment 5Sb: DA 5: CN w/ IC areas

Runoff = 13.82 cfs @ 12.19 hrs, Volume= 54,959 cf, Depth=11.34" Routed to Pond 10P : Underground Storage w/ Porous Pavement 5

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

| | A | rea (sf) | CN I | Description | | | | | |
|--------------------------------|---------------------|----------|---------|--|-------------|--|--|--|--|
| * | | 1,112 | 79 (| Open Space (Fair) C | | | | | |
| * | | 9,899 | 74 (| Open Spac | e (good) C | | | | |
| * | | 47,152 | 98 I | Impervious | | | | | |
| 58.163 94 Weighted Average | | | | | | | | | |
| 11,011 75 18.93% Pervious Area | | | | | | | | | |
| | | 47,152 | 98 8 | 31.07% Imp | pervious Ar | ea | | | |
| | | | | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description | | | |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | | | | |
| | 8.7 | 64 | 0.0105 | 0.12 | | Sheet Flow, Sheet flow -grass | | | |
| | 1.3 179 0.0129 2.31 | | | Grass: Short n= 0.150 P2= 3.34" | | | | | |
| | | | | Shallow Concentrated Flow, SCF - paved | | | | | |
| | | | | Paved Kv= 20.3 fps | | | | | |
| | 1.5 | 67 | 0.0120 | 0.77 | | Shallow Concentrated Flow, SCF _ grass | | | |
| _ | | | | | | Short Grass Pasture Kv= 7.0 fps | | | |

11.5 310 Total

Subcatchment 5Sb: DA 5: CN w/ IC areas



Summary for Subcatchment 6S: DA 6: CN w/ IC areas

28,199 cf, Depth=10.56" Runoff 6.91 cfs @ 12.21 hrs, Volume= = Routed to Pond 11P : Proposed Rain Garden 2 (East)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

| | A | rea (sf) | CN I | Description | | | | |
|----------------------------|------------------|----------|---------|-------------|--|--|--|--|
| * | | 16,559 | 79 (| Open Spac | ipen Space (fair) C | | | |
| * | | 998 | 74 (| Open Spac | e (good) C | | | |
| * | | 14,476 | 98 I | mpervious | | | | |
| 32,033 87 Weighted Average | | | | | | | | |
| | | 17,557 | 79 క | 54.81% Per | vious Area | | | |
| | | 14,476 | 98 4 | 45.19% Imp | pervious Are | ea | | |
| | | | | | | | | |
| | Tc | Length | Slope | Velocity | Capacity | Description | | |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | | | |
| | 12.8 | 100 | 0.0098 | 0.13 | | Sheet Flow, Sheet flow - grass | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | |
| | 0.5 86 0.0244 3. | | 3.17 | | Shallow Concentrated Flow, SCF - paved | | | |
| | | | | | | Paved Kv= 20.3 fps | | |
| | 0.7 | 90 | 0.0178 | 2.15 | | Shallow Concentrated Flow, SCF - unpaved | | |
| | | | | | | Unpaved Kv= 16.1 fps | | |
| | | | | | | | | |

14.0 276 Total

Subcatchment 6S: DA 6: CN w/ IC areas



Summary for Subcatchment 7S: DA 7 (Offsite South): CN w/ IC areas

Runoff = 21.82 cfs @ 12.22 hrs, Volume= Routed to Link 1L : Offsite Flows 87,434 cf, Depth= 9.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

| | A | rea (sf) | CN [| Description | | | | |
|-----------------------------|--------------------------------|----------|-------------|---------------------|-------------|--|--|--|
| * | | 70,444 | 79 (| Dpen Space (fair) C | | | | |
| * | | 16,401 | 74 (| Open Spac | e (good) C | | | |
| * | | 20,156 | 98 I | mpervious | | | | |
| 107,001 82 Weighted Average | | | | | verage | | | |
| | 86,845 78 81.16% Pervious Area | | | | | | | |
| | | 20,156 | 98 1 | 8.84% Imp | pervious Ar | ea | | |
| | | | | | • • | - | | |
| | ŢĊ | Length | Slope | Velocity | Capacity | Description | | |
| _ | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | | | |
| | 12.1 | 100 | 0.0112 | 0.14 | | Sheet Flow, Sheet flow | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | |
| | 2.2 | 165 | 0.0305 | 1.22 | | Shallow Concentrated Flow, SCF _ grass | | |
| | | | | | | Short Grass Pasture Kv= 7.0 fps | | |
| | 0.2 | 44 | 0.0317 | 3.61 | | Shallow Concentrated Flow, SCF _ paved | | |
| | | | | | | Paved Kv= 20.3 fps | | |
| | | | | | | | | |

14.5 309 Total

Subcatchment 7S: DA 7 (Offsite South): CN w/ IC areas



Summary for Subcatchment 8S: DA 8 (Offsite North): CN w/ IC areas

Runoff = 57.48 cfs @ 12.28 hrs, Volume= 250,371 cf, Depth= 8.82" Routed to Link 1L : Offsite Flows

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

| | A | rea (sf) | CN | Description | l | |
|---|-------|----------|-------|--------------|--------------|---|
| * | | 2,767 | 70 | Brush (fair) | С | |
| * | | 63,031 | 77 | Brush (fair) | D | |
| * | | 86,643 | 65 | Brush (goo | d) C | |
| * | | 64,708 | 73 | Brush (goo | d) D | |
| * | | 73,083 | 79 | Open spac | e (Fair) C | |
| * | | 30,261 | 84 | Open spac | e (fair) D | |
| * | | 4,460 | 74 | Open spac | e (good) C | |
| * | | 9,087 | 80 | Open space | e (good) D | |
| * | | 6,602 | 98 | Impervious | | |
| | 3 | 840,642 | 75 | Weighted A | Average | |
| | 3 | 34,040 | 74 | 98.06% Pe | rvious Area | |
| | | 6,602 | 98 | 1.94% Imp | ervious Area | а |
| | | | | | | |
| | Тс | Length | Slop | e Velocity | Capacity | Description |
| | (min) | (feet) | (ft/f | t) (ft/sec) | (cfs) | |
| | 7.5 | 100 | 0.036 | 6 0.22 | | Sheet Flow, sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 11.9 | 876 | 0.006 | 7 1.23 | | Shallow Concentrated Flow, scf - grass waterway |
| | | | | | | Grassed Waterway Kv= 15.0 fps |
| | 19.4 | 976 | Total | | | |



Subcatchment 8S: DA 8 (Offsite North): CN w/ IC areas

Summary for Subcatchment 9S: DA 9 (Offsite Field West): CN w/ IC areas

Runoff = 64.44 cfs @ 12.42 hrs, Volume= 345,655 cf, Depth= 8.65" Routed to Link 1L : Offsite Flows

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

| | A | rea (sf) | CN I | Description | | |
|---|----------|----------|---------|-------------|--------------|---|
| * | | 72,478 | 65 I | Brush (good | d) C | |
| * | | 10,448 | 79 (| Open spcae | e (fair) C | |
| * | 3 | 92,515 | 74 (| Open Spac | e (good) C | |
| * | | 4,279 | 98 I | mpervious | , | |
| | 4 | 79,720 | 73 | Neighted A | verage | |
| | 4 | 75,441 | 73 9 | 99.11% Pei | vious Area | |
| | 4.279 98 | | | 0.89% Impe | ervious Area | а |
| | | | | | | |
| | Tc | Length | Slope | Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | |
| | 10.5 | 100 | 0.0159 | 0.16 | | Sheet Flow, Sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 7.1 | 362 | 0.0148 | 0.85 | | Shallow Concentrated Flow, SCF - grass |
| | | | | | | Short Grass Pasture Kv= 7.0 fps |
| | 12.8 | 1,006 | 0.0076 | 1.31 | | Shallow Concentrated Flow, SCF - grass waterway |
| _ | | | | | | Grassed Waterway Kv= 15.0 fps |
| | 30.4 | 1.468 | Total | | | |

Subcatchment 9S: DA 9 (Offsite Field West): CN w/ IC areas



Summary for Subcatchment 31S: RG 2 DA

Runoff = 6.82 cfs @ 12.21 hrs, Volume= 27,367 cf, Depth=10.25"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

| | A | rea (sf) | CN | Description | | | | | | |
|----------------------------------|----------------------|------------------|-----------------|--------------------------|-------------------|---|--|--|--|--|
| * | | 21,638 | 79 | Open Spac | e (fair) C | | | | | |
| * | 10,397 98 Impervious | | | | · · · | | | | | |
| | | 32,035 | 85 | Weighted A | ghted Average | | | | | |
| | | 21,638 | 79 | 67.54% Pei | vious Area | | | | | |
| 10,397 98 32.46% Impervious Area | | | | | pervious Are | ea | | | | |
| (m | Tc iin) | Length (feet) | Slope (ft/ft | e Velocity) (ft/sec) | Capacity (cfs) | Description | | | | |
| 12 | 2.8 | 100 | 0.0098 | 3 0.13 | () | Sheet Flow, Sheet flow - grass Grass: Short n= 0.150 P2= 3.34" | | | | |
| (| 0.5 | 86 | 0.0244 | 4 3.17 | | Shallow Concentrated Flow, SCF - paved Paved Kv= 20.3 fps | | | | |
| (| 0.7 | 90 | 0.0178 | 3 2.15 | | Shallow Concentrated Flow, SCF - unpaved Unpaved Kv= 16.1 fps | | | | |
| 14 | 4.0 | 276 | Total | | | | | | | |

Subcatchment 31S: RG 2 DA



Summary for Reach 1R: Existing Bioswale West 1

4.90 cfs @ 12.22 hrs, Volume=

22,637 sf, 64.43% Impervious, Inflow Depth = 10.94" for 100-Year 2100 event

20.633 cf

Inflow Area =

=

Inflow

4.87 cfs @ 12.22 hrs, Volume= Outflow = 20,633 cf, Atten= 1%, Lag= 0.3 min Routed to Pond 1P : Exising Rain Garden 1 West Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Max. Velocity= 2.89 fps, Min. Travel Time= 0.2 min Avg. Velocity = 0.84 fps, Avg. Travel Time= 0.7 min Peak Storage= 56 cf @ 12.22 hrs Average Depth at Peak Storage= 0.40', Surface Width= 5.41' Bank-Full Depth= 0.50' Flow Area= 2.3 sf, Capacity= 7.36 cfs 3.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds Side Slope Z-value= 3.0 '/' Top Width= 6.00' Length= 33.0' Slope= 0.0227 '/' Inlet Invert= 100.75', Outlet Invert= 100.00' ‡ **Reach 1R: Existing Bioswale West 1** Hydrograph Inflow 4.90 cfs Outflow 4.87 cfs Inflow Area=22,637 sf 5 Avg. Flow Depth=0.40' Max Vel=2.89 fps 4 n=0.035 (cfs) L=33.0' 3 Flow S=0.0227 '/' Capacity=7.36 cfs 2. 1 0 0 2 46 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 Time (hours)

Summary for Reach 2R: Bioswale E 1 RG 3

[91] Warning: Storage range exceeded by 0.03' [55] Hint: Peak inflow is 114% of Manning's capacity

 Inflow Area =
 19,898 sf, 48.83% Impervious, Inflow Depth = 10.65" for 100-Year _2100 event

 Inflow =
 4.60 cfs @
 12.19 hrs, Volume=
 17,665 cf

 Outflow =
 4.58 cfs @
 12.19 hrs, Volume=
 17,665 cf, Atten= 0%, Lag= 0.3 min

 Routed to Pond 9P : Proposed Rain Garden 3 (North East)
 100-Year _2100 event

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Max. Velocity= 3.32 fps, Min. Travel Time= 0.2 min Avg. Velocity = 1.13 fps, Avg. Travel Time= 0.5 min

Peak Storage= 48 cf @ 12.19 hrs Average Depth at Peak Storage= 0.53', Surface Width= 4.20' Bank-Full Depth= 0.50' Flow Area= 1.3 sf, Capacity= 4.02 cfs

1.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds Side Slope Z-value= 3.0 '/' Top Width= 4.00' Length= 35.0' Slope= 0.0286 '/' Inlet Invert= 101.00', Outlet Invert= 100.00'

‡

Reach 2R: Bioswale E 1 RG 3



Summary for Pond 1P: Exising Rain Garden 1 West

[93] Warning: Storage range exceeded by 0.54'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

[62] Hint: Exceeded Reach 1R OUTLET depth by 0.39' @ 12.25 hrs

Inflow Area = 22,637 sf, 64.43% Impervious, Inflow Depth = 10.94" for 100-Year 2100 event 4.87 cfs @ 12.22 hrs, Volume= Inflow = 20,633 cf 4.88 cfs @ 12.23 hrs, Volume= 0.38 cfs @ 12.23 hrs, Volume= = Outflow 20,449 cf, Atten= 0%, Lag= 0.3 min Primarv = 9.492 cf Routed to Pond 2P : Underground Storage w/ Porous Pavement 1 Secondary = 4.50 cfs @ 12.23 hrs, Volume= 10,957 cf Routed to Pond 2P : Underground Storage w/ Porous Pavement 1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.79' @ 12.23 hrs Surf.Area= 1,750 sf Storage= 1,831 cf

Plug-Flow detention time= 166.8 min calculated for 20,449 cf (99% of inflow) Center-of-Mass det. time= 160.8 min (924.0 - 763.3)

| Volume | Invert | Invert Avail.Sto | | rage Storage Description | | | | |
|------------------------|----------------|-------------------------|------------------------|--|--|--|--|--|
| #1 | 98.25' | 3.25' 1,83 | | 1 cf Custom Stage | cf Custom Stage Data (Conic)Listed below (Recalc) | | | |
| Elevatio (fee | on Su et) | rf.Area (sq-ft) | Void %) | s Inc.Store) (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) | | |
| 98.2 99.2 | 25 25 | 1,445 1,445 | 0.0 35.0 |) 0) 506 | 0 506 | 1,445 1,580 | | |
| 99.8 100.0 100.2 | 50 00 25 | 1,445 1,750 1,750 | 25.0 100.0 100.0 |) 90) 798) 438 | 596 1,394 1,831 | 1,613 1,927 1,964 | | |
| Device | Routing | ١n | /ert | Outlet Devices | | | | |
| #1 | Primary | 98. | .15' | 4.0" Round Culver Inlet / Outlet Invert= n= 0.020 Corrugate | t L= 11.0' Ke= 0.50 98.15'/98.09' S= 0 d PF_corrugated inte | 00 0.0055 '/' Cc= 0.900 erior Flow Area= 0.09 sf | | |
| #2 | Device 1 | 98.15' | | 0.5" Vert. Restrictive Orifice C= 0.600 Limited to weir flow at low heads | | | | |
| #3 | Device 2 | 98. | .25' | 4.0" Round 4" HDPE Underdrain L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 98.25' / 98.15' S= 0.0050 '/' Cc= 0.900 n= 0.020 Corrugated PE corrugated interior Flow Area= 0.09 sf | | | | |
| #4 Device 3 | | 98.25' | | 0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads | | | | |
| #5 | Device 1 | 100. | .00' | 4.0" Horiz. Draintech Atrium C= 0.600 Limited to weir flow at low heads | | | | |
| #6 | Secondary | Secondary 100. | | 3.0' long x 2.0' bre Head (feet) 0.20 0. 2.50 3.00 3.50 Coef. (English) 2.54 2.85 3.07 3.20 3.3 | ong x 2.0' breadth Broad-Crested Rectangular Weir 1 (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 3.00 3.50 5. (English) 2.54 2.61 2.60 2.66 2.70 2.77 2.89 2.88 3.07 3.20 3.32 | | | |

| Site1HillsboroughMunicpComplex_2024062NOAA 24-hr C 100-Year | _2100 Rainfall=12.15" |
|---|-----------------------|
| Prepared by Rutgers Cooperative Extension Water Resources Program | Printed 6/29/2024 |
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Primary OutFlow Max=0.38 cfs @ 12.23 hrs HW=100.78' (Free Discharge) 1=Culvert (Passes 0.38 cfs of 0.48 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.78 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.38 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.75 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.37 cfs @ 4.26 fps)

Secondary OutFlow Max=4.41 cfs @ 12.23 hrs HW=100.78' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 4.41 cfs @ 2.15 fps)



Pond 1P: Exising Rain Garden 1 West

Summary for Pond 2P: Underground Storage w/ Porous Pavement 1

[44] Hint: Outlet device #3 is below defined storage[79] Warning: Submerged Pond 1P Primary device # 1 INLET by 0.96'

| Inflow Area = | | 61,742 sf, | 66.85% Impervious, | Inflow Depth > 10.91" | for 100-Year _2100 event |
|---------------|---|-------------|--------------------|-----------------------|--------------------------|
| Inflow | = | 13.29 cfs @ | 12.22 hrs, Volume= | 56,143 cf | |
| Outflow | = | 9.43 cfs @ | 12.35 hrs, Volume= | 38,652 cf, Atte | n= 29%, Lag= 8.0 min |
| Primary | = | 0.02 cfs @ | 12.35 hrs, Volume= | 3,953 cf | |
| Secondary | = | 9.41 cfs @ | 12.35 hrs, Volume= | 34,699 cf | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 99.11' @ 12.35 hrs Surf.Area= 13,421 sf Storage= 24,498 cf

Plug-Flow detention time= 340.2 min calculated for 38,625 cf (69% of inflow) Center-of-Mass det. time= 201.4 min (1,021.9 - 820.5)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 1,612 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 9,359 cf | 72.75'W x 146.02'L x 3.50'H Field A |
| | | | 37,179 cf Overall - 13,782 cf Embedded = 23,397 cf x 40.0% Voids |
| #3A | 96.17' | 13,782 cf | ADS_StormTech SC-740 +Cap x 300 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 300 Chambers in 15 Rows |
| | | 24 752 of | Total Available Storage |

24,753 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevation | | Surf.Area | Void | s Inc.Store | Cum.Store |) |
|-----------|----------|-----------|------|------------------------|-------------------|--------------------------------|
| (fee | et) | (sq-ft) | (% |) (cubic-feet) | (cubic-feet) | |
| 96.17 | | 2,798 | 0. | 0 0 | C |) |
| 97.67 | | 2,798 | 35. | 0 1,469 | 1,469 |) |
| 97.83 | | 2,798 | 15. | 0 67 | 1,536 | 6 |
| 98.01 | | 2,798 | 15. | D 76 | 1,612 | |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restriction | on Orifice C= C | 0.600 |
| | - | | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HDI | PE Underdrain | L= 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | 92.17' / 90.37' | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugate | d interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. P | erforations X 40 | 00.00 columns |
| | | | | X 3 rows C= 0.600 | Limited to weir f | flow at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bre | adth Broad-Cre | ested Rectangular Weir |
| | | | | Head (feet) 0.20 0. | .40 0.60 0.80 1 | 1.00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | | |
| | | | | Coef. (English) 2.54 | 4 2.61 2.61 2.6 | 0 2.66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3.3 | 32 | |

Primary OutFlow Max=0.02 cfs @ 12.35 hrs HW=99.11' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 12.75 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.50 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 9.51 cfs potential flow)

Secondary OutFlow Max=9.36 cfs @ 12.35 hrs HW=99.11' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 9.36 cfs @ 2.82 fps)

Pond 2P: Underground Storage w/ Porous Pavement 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

20 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 144.02' Row Length +12.0" End Stone x 2 = 146.02' Base Length 15 Rows x 51.0" Wide + 6.0" Spacing x 14 + 12.0" Side Stone x 2 = 72.75' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

300 Chambers x 45.9 cf = 13,782.0 cf Chamber Storage

37,179.5 cf Field - 13,782.0 cf Chambers = 23,397.5 cf Stone x 40.0% Voids = 9,359.0 cf Stone Storage

Chamber Storage + Stone Storage = 23,141.0 cf = 0.531 af Overall Storage Efficiency = 62.2% Overall System Size = 146.02' x 72.75' x 3.50'

300 Chambers 1,377.0 cy Field 866.6 cy Stone





Pond 2P: Underground Storage w/ Porous Pavement 1
Summary for Pond 3P: Underground Storage w/ Porous Pavement 2

[44] Hint: Outlet device #3 is below defined storage[93] Warning: Storage range exceeded by 0.04'

| Inflow Area | = | 58,249 sf, | 86.46% Impervi | ous, Inflow Depth = 11 | .52" for 100 | -Year _2100 event |
|-------------|---|-------------|------------------|------------------------|--------------|-------------------|
| Inflow | = | 16.21 cfs @ | 12.14 hrs, Volun | ne= 55,920 cf | | |
| Outflow : | = | 10.70 cfs @ | 12.22 hrs, Volun | ne= 35,612 cf, | Atten= 34%, | Lag= 5.2 min |
| Primary : | = | 0.02 cfs @ | 12.22 hrs, Volun | ne= 3,964 cf | | - |
| Secondary | = | 10.69 cfs @ | 12.22 hrs, Volun | ne= 31,648 cf | | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 99.21' @ 12.22 hrs Surf.Area= 23,296 sf Storage= 27,931 cf

Plug-Flow detention time= 389.6 min calculated for 35,612 cf (64% of inflow) Center-of-Mass det. time= 279.5 min (1,024.1 - 744.6)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 8,187 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 8,029 cf | 82.25'W x 110.42'L x 3.50'H Field A |
| | | | 31,786 cf Overall - 11,715 cf Embedded = 20,071 cf x 40.0% Voids |
| #3A | 96.17' | 11,715 cf | ADS_StormTech SC-740 +Cap x 255 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 255 Chambers in 17 Rows |
| | | 27 021 of | Total Available Storage |

27,931 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void (% | s Inc.Store b) (cubic-feet) | Cum.Store (cubic-feet) | |
|------------------|-----------|----------------------|------------|--------------------------------|---------------------------|------------------------------|
| 96.1 | 17 | 14,214 | 0. | 0 0 | 0 | |
| 97.6 | 67 | 14,214 | 35. | 0 7,462 | 7,462 | |
| 97.8 | 33 | 14,214 | 15. | 0 341 | 7,803 | |
| 98.0 |)1 | 14,214 | 15. | 0 384 | 8,187 | |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | on Orifice C= 0. | 600 |
| | | | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | PE Underdrain L | .= 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | 92.17' / 90.37' | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. P | erforations X 40 | 0.00 columns |
| | | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bre | adth Broad-Cres | sted Rectangular Weir |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | | |
| | | | | Coef. (English) 2.54 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3.3 | 32 | |

Primary OutFlow Max=0.02 cfs @ 12.22 hrs HW=99.17' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 12.81 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.51 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 9.55 cfs potential flow)

Secondary OutFlow Max=10.23 cfs @ 12.22 hrs HW=99.17' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 10.23 cfs @ 2.91 fps)

Pond 3P: Underground Storage w/ Porous Pavement 2 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

15 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 108.42' Row Length +12.0" End Stone x 2 = 110.42' Base Length
17 Rows x 51.0" Wide + 6.0" Spacing x 16 + 12.0" Side Stone x 2 = 82.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

255 Chambers x 45.9 cf = 11,714.7 cf Chamber Storage

31,786.2 cf Field - 11,714.7 cf Chambers = 20,071.5 cf Stone x 40.0% Voids = 8,028.6 cf Stone Storage

Chamber Storage + Stone Storage = 19,743.3 cf = 0.453 af Overall Storage Efficiency = 62.1% Overall System Size = 110.42' x 82.25' x 3.50'

255 Chambers 1,177.3 cy Field 743.4 cy Stone





Pond 3P: Underground Storage w/ Porous Pavement 2

Summary for Pond 4P: Existing Rain Garden 2 Front

[93] Warning: Storage range exceeded by 0.72'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=4)

Inflow Area = 25,889 sf, 48.62% Impervious, Inflow Depth = 10.65" for 100-Year 2100 event 6.68 cfs @ 12.15 hrs. Volume= Inflow = 22,972 cf 6.79 cfs @ 12.15 hrs, Volume= 0.42 cfs @ 12.15 hrs, Volume= = Outflow 21,818 cf, Atten= 0%, Lag= 0.0 min Primarv = 9.281 cf Routed to Pond 6P : Underground Storage w/ Porous Pavement 3 Secondary = 6.37 cfs @ 12.15 hrs, Volume= 12,536 cf Routed to Pond 6P : Underground Storage w/ Porous Pavement 3

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 101.97' @ 12.15 hrs Surf.Area= 3,045 sf Storage= 3,267 cf

Plug-Flow detention time= 217.4 min calculated for 21,803 cf (95% of inflow) Center-of-Mass det. time= 189.4 min (954.0 - 764.6)

| Volume | Invert | Avai | I.Stor | age Storage Descr | iption | | |
|------------------|--------------|--------------------|------------|--|--|---|--|
| #1 | 99.25' | | 3,26 | 7 cf Custom Stage | e Data (Conic)Listed | d below (Recalc) | |
| Elevatio (fee | on Su et) | rf.Area (sq-ft) | Void %) | s Inc.Store | Cum.Store (cubic-feet) | Wet.Area (sq-ft) | |
| 99.2 | 25 | 2,635 | 0. | 0 0 | 0 | 2,635 | |
| 100.2 | 25 | 2,635 | 35. | 0 922 | 922 | 2,817 | |
| 100.5 | 50 | 2,635 | 25. | 0 165 | 1,087 | 2,862 | |
| 101.0 | 00 | 3,045 | 100. | 0 1,419 | 2,506 | 3,283 | |
| 101.2 | 25 | 3,045 | 100. | 0 761 | 3,267 | 3,332 | |
| Device | Routing | In | vert | Outlet Devices | | | |
| #1 | Primary | 99 | .15' | 4.0" Round Culver Inlet / Outlet Invert= n= 0 020 Corrugate | t L= 11.0' Ke= 0.5 99.15' / 99.09' S= d PE_corrugated int | 00 0.0055 '/' Cc= 0.900 rerior Flow Area= 0.09 sf | |
| #2 | Device 1 | 99 | .15' | 0.5" Vert. Restrictiv Limited to weir flow | ve Orifice C= 0.600 at low heads |) | |
| #3 | Device 2 | 99 | .25' | 4.0" Round 4" HD Inlet / Outlet Invert= n= 0.020 Corrugate | PE Underdrain L= 2 99.25' / 99.15' S= | 20.0' Ke= 0.500 0.0050 '/' Cc= 0.900 terior Elow Area= 0.09 sf | |
| #4 | Device 3 | 99 | .25' | 0.9" x 0.1" Horiz. P X 3 rows C= 0.600 | erforations X 400.0 Limited to weir flow | 0 columns at low heads | |
| #5 | Device 1 | 101 | .00' | 4.0" Horiz. Drainte Limited to weir flow | ch Atrium C= 0.60 at low heads | 0 | |
| #6 | Secondary | 101 | .10' | 3.0' long x 2.0' bre Head (feet) 0.20 0. 2.50 3.00 3.50 Coef. (English) 2.54 2.85 3.07 3.20 3.3 | adth Broad-Crester 40 0.60 0.80 1.00 4 2.61 2.61 2.60 2 | d Rectangular Weir 1.20 1.40 1.60 1.80 2.00 .66 2.70 2.77 2.89 2.88 | |

Primary OutFlow Max=0.42 cfs @ 12.15 hrs HW=101.97' (Free Discharge) 1=Culvert (Passes 0.42 cfs of 0.50 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 8.05 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.39 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.95 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.41 cfs @ 4.74 fps)

Secondary OutFlow Max=6.36 cfs @ 12.15 hrs HW=101.97' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 6.36 cfs @ 2.44 fps)



Pond 4P: Existing Rain Garden 2 Front

Summary for Pond 5P: Proposed Rain Garden 1 (South West)

[93] Warning: Storage range exceeded by 0.62'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=5)

Inflow Area = 21,388 sf, 65.14% Impervious, Inflow Depth = 10.81" for 100-Year 2100 event 5.52 cfs @ 12.15 hrs. Volume= Inflow = 19,268 cf 5.67 cfs @ 12.15 hrs, Volume= 0.40 cfs @ 12.15 hrs, Volume= = Outflow 18,700 cf, Atten= 0%, Lag= 0.0 min Primarv = 8.765 cf Routed to Pond 6P : Underground Storage w/ Porous Pavement 3 Secondary = 5.27 cfs @ 12.15 hrs, Volume= 9,935 cf Routed to Pond 6P : Underground Storage w/ Porous Pavement 3

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 101.87' @ 12.15 hrs Surf.Area= 2,325 sf Storage= 2,466 cf

Plug-Flow detention time= 220.3 min calculated for 18,700 cf (97% of inflow) Center-of-Mass det. time= 201.5 min (959.3 - 757.8)

| Volume | Invert | Avai | il.Stor | age Storage Desc | ription | |
|-------------------------|----------------|-------------------------|---------------------|--|--|---|
| #1 | 99.25' | | 2,46 | 6 cf Custom Stag | e Data (Conic)Liste | ed below (Recalc) |
| Elevatio (fee | on Su et) | rf.Area (sq-ft) | Void (% | ls Inc.Store 6) (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
| 99.2 100.2 | 25 25 | 1,970 1,970 | 0. 35. | 0 0 0 690 | 0 690 | 1,970 2,127 |
| 100.5 101.0 101.2 | 50)0 25 | 1,970 2,325 2,325 | 25. 100. 100. | .0 123 0 1,073 .0 581 | 813 1,885 2,466 | 2,167 2,531 2,574 |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 99 | .15' | 4.0" Round Culve Inlet / Outlet Invert= n= 0.020 Corrugate | rt L= 11.0' Ke= 0. 99.15'/99.09' S= ed PE, corrugated i | .500 = 0.0055 '/' Cc= 0.900 nterior. Flow Area= 0.09 sf |
| #2 | Device 1 | 99 | .15' | 0.5" Vert. Restrict | ve Orifice C= 0.6 at low heads | 00 |
| #3 | Device 2 | 99 | .25' | 4.0" Round 4" HD Inlet / Outlet Invert= n= 0.020 Corrugate | PE Underdrain L= = 99.25' / 99.15' S= ed PE. corrugated i | = 20.0' Ke= 0.500 = 0.0050 '/' Cc= 0.900 nterior. Flow Area= 0.09 sf |
| #4 | Device 3 | 99 | .25' | 0.9" x 0.1" Horiz. F X 3 rows C= 0.600 | Perforations X 400 Limited to weir flow | .00 columns w at low heads |
| #5 | Device 1 | 101 | .00' | 4.0" Horiz. Drainte Limited to weir flow | ch Atrium C= 0.6 at low heads | 00 |
| #6 | Secondary | 101 | .10' | 3.0' long x 2.0' bre Head (feet) 0.20 0 2.50 3.00 3.50 Coef. (English) 2.5 2.85 3.07 3.20 3.3 | eadth Broad-Crest 0.40 0.60 0.80 1.0 4 2.61 2.61 2.60 32 | ed Rectangular Weir 0 1.20 1.40 1.60 1.80 2.00 2.66 2.70 2.77 2.89 2.88 |

Primary OutFlow Max=0.40 cfs @ 12.15 hrs HW=101.87' (Free Discharge) 1=Culvert (Passes 0.40 cfs of 0.49 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.91 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.38 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.84 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.39 cfs @ 4.49 fps)

Secondary OutFlow Max=5.26 cfs @ 12.15 hrs HW=101.87' (Free Discharge) **6=Broad-Crested Rectangular Weir** (Weir Controls 5.26 cfs @ 2.28 fps)



Pond 5P: Proposed Rain Garden 1 (South West)

Summary for Pond 6P: Underground Storage w/ Porous Pavement 3

[44] Hint: Outlet device #3 is below defined storage

[93] Warning: Storage range exceeded by 1.09'

[79] Warning: Submerged Pond 4P Primary device # 1 INLET by 1.11'

[79] Warning: Submerged Pond 5P Primary device # 1 INLET by 1.11'

| Inflow Area | = | 158,623 sf, | 63.48% Impervious, | Inflow Depth > 10.72 | for 100-Year _2100 event |
|-------------|---|-------------|--------------------|----------------------|--------------------------|
| Inflow | = | 41.36 cfs @ | 12.15 hrs, Volume= | 141,696 cf | |
| Outflow | = | 30.18 cfs @ | 12.30 hrs, Volume= | 87,430 cf, At | ten= 27%, Lag= 9.0 min |
| Primary | = | 0.02 cfs @ | 12.30 hrs, Volume= | 3,985 cf | |
| Secondary | = | 30.16 cfs @ | 12.30 hrs, Volume= | 83,445 cf | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.26' @ 12.30 hrs Surf.Area= 38,014 sf Storage= 71,344 cf

Plug-Flow detention time= 321.7 min calculated for 87,369 cf (62% of inflow) Center-of-Mass det. time= 174.7 min (988.5 - 813.8)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|---|
| #1 | 96.17' | 4,287 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 26,630 cf | 106.00'W x 288.42'L x 3.50'H Field A |
| | | | 107,003 cf Overall - 40,427 cf Embedded = 66,575 cf x 40.0% Voids |
| #3A | 96.17' | 40,427 cf | ADS_StormTech SC-740 +Cap x 880 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 880 Chambers in 22 Rows |
| | | 74 044 5 | |

71,344 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevation (feet) | Surf.Area (sq-ft) | Voids (%) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|--------------|---------------------------|---------------------------|
| 96.17 | 7,442 | 0.0 | 0 | 0 |
| 97.67 | 7,442 | 35.0 | 3,907 | 3,907 |
| 97.83 | 7,442 | 15.0 | 179 | 4,086 |
| 98.01 | 7,442 | 15.0 | 201 | 4,287 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 92.07' | 0.5" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads |
| #2 | Device 1 | 92.17' | 6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92.17' | 0.9" x 0.1" Horiz. Perforations X 400.00 columns |
| #4 | Secondary | 98.00' | 3.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32 |

Primary OutFlow Max=0.02 cfs @ 12.30 hrs HW=100.26' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 13.76 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.54 cfs potential flow) -3=Perforations (Passes 0.02 cfs of 10.27 cfs potential flow)

Secondary OutFlow Max=30.12 cfs @ 12.30 hrs HW=100.26' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 30.12 cfs @ 4.45 fps)

Pond 6P: Underground Storage w/ Porous Pavement 3 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

40 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 286.42' Row Length +12.0" End Stone x 2 = 288.42' Base Length 22 Rows x 51.0" Wide + 6.0" Spacing x 21 + 12.0" Side Stone x 2 = 106.00' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

880 Chambers x 45.9 cf = 40,427.2 cf Chamber Storage

107,002.6 cf Field - 40,427.2 cf Chambers = 66,575.4 cf Stone x 40.0% Voids = 26,630.1 cf Stone Storage

Chamber Storage + Stone Storage = 67,057.4 cf = 1.539 af Overall Storage Efficiency = 62.7% Overall System Size = 288.42' x 106.00' x 3.50'

880 Chambers 3,963.1 cy Field 2,465.8 cy Stone





Pond 6P: Underground Storage w/ Porous Pavement 3

Summary for Pond 7P: Proposed Rain Garden 4 (North)

[93] Warning: Storage range exceeded by 0.67'

Inflow Area = 24,369 sf, 57.53% Impervious, Inflow Depth = 10.87" for 100-Year 2100 event 6.32 cfs @ 12.15 hrs, Volume= Inflow = 22,067 cf 6.26 cfs @ 12.15 hrs, Volume= Outflow = 21,237 cf, Atten= 1%, Lag= 0.0 min 0.41 cfs @ 12.15 hrs, Volume= Primary = 9,513 cf Routed to Pond 8P : Underground Storage w/ Porous Pavement 4 5.85 cfs @ 12.15 hrs, Volume= Secondary = 11.723 cf Routed to Pond 8P : Underground Storage w/ Porous Pavement 4

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2 Peak Elev= 100.92' @ 12.15 hrs Surf.Area= 2,435 sf Storage= 2,453 cf

Plug-Flow detention time= 203.5 min calculated for 21,237 cf (96% of inflow) Center-of-Mass det. time= 180.2 min (940.1 - 759.9)

| Volume | Invert | Avai | l.Stora | age Storage Descri | ption | |
|----------------|--------------|--------------------|-------------|--|---|---|
| #1 | 98.25' | | 2,45 | 3 cf Custom Stage | e Data (Conic)Listed | d below (Recalc) |
| Elevati (fe | on Su et) | rf.Area (sq-ft) | Voids %) | s Inc.Store | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
| 98. | 25 | 1.870 | 0.0 | 0 0 | 0 | 1,870 |
| 99. | 25 | 1,870 | 35.0 | 0 655 | 655 | 2,023 |
| 99. | 50 | 1,870 | 25.0 | 0 117 | 771 | 2,062 |
| 100. | 00 | 2,435 | 100.0 | 0 1,073 | 1,845 | 2,633 |
| 100. | 25 | 2,435 | 100.0 | 0 609 | 2,453 | 2,676 |
| Device | Routing | Inv | vert | Outlet Devices | | |
| #1 | Primary | 98. | .15' | 4.0" Round Culver Inlet / Outlet Invert= n= 0.020 Corrugate | t L= 11.0' Ke= 0.5 98.15' / 98.09' S= d PE. corrugated int | 00 0.0055 '/' Cc= 0.900 terior. Flow Area= 0.09 sf |
| #2 | Device 1 | 98. | .15' | 0.5" Vert. Restrictiv | e Orifice C= 0.600 to heads |) |
| #3 | Device 2 | 98. | .25' | 4.0" Round 4" HDF Inlet / Outlet Invert= | PE Underdrain L= 2 98.25' / 98.15' S= | 20.0' Ke= 0.500 0.0050 '/' Cc= 0.900 |
| #4 | Device 3 | 98. | .25' | n= 0.020 Corrugate 0.9" x 0.1" Horiz. Po X 3 rows C= 0.600 | d PE, corrugated int erforations X 400.0 Limited to weir flow | erior, Flow Area= 0.09 sf 0 columns at low heads |
| #5 | Device 1 | 100. | .00' | 4.0" Horiz. Drainted | ch Atrium C= 0.60 | 0 |
| #6 | Secondary | 100. | .10' | Limited to weir flow a 3.0' long x 2.0' brea Head (feet) 0.20 0. 2.50 3.00 3.50 Coef. (English) 2.54 2.85 3.07 3.20 3.3 | at low heads adth Broad-Creste 40 0.60 0.80 1.00 4 2.61 2.61 2.60 2 2 | d Rectangular Weir 1.20 1.40 1.60 1.80 2.00 .66 2.70 2.77 2.89 2.88 |

Primary OutFlow Max=0.41 cfs @ 12.15 hrs HW=100.92' (Free Discharge) 1=Culvert (Passes 0.41 cfs of 0.49 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.99 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.39 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.90 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.40 cfs @ 4.62 fps)

Secondary OutFlow Max=5.82 cfs @ 12.15 hrs HW=100.92' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 5.82 cfs @ 2.36 fps)



Pond 7P: Proposed Rain Garden 4 (North)

Summary for Pond 8P: Underground Storage w/ Porous Pavement 4

[44] Hint: Outlet device #3 is below defined storage

[93] Warning: Storage range exceeded by 0.06'

[79] Warning: Submerged Pond 7P Primary device # 1 INLET by 1.07'

| Inflow Area = | 97,166 sf, 80.9 | 6% Impervious, | Inflow Depth > 11.29 | ' for 100-Year _2100 event |
|---------------|------------------|----------------|----------------------|----------------------------|
| Inflow = | 25.67 cfs @ 12.1 | 5 hrs, Volume= | 91,436 cf | |
| Outflow = | 11.11 cfs @ 12.3 | 2 hrs, Volume= | 54,513 cf, Att | en= 57%, Lag= 10.0 min |
| Primary = | 0.02 cfs @ 12.3 | 2 hrs, Volume= | 3,983 cf | |
| Secondary = | 11.09 cfs @ 12.3 | 2 hrs, Volume= | 50,531 cf | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 99.23' @ 12.32 hrs Surf.Area= 33,612 sf Storage= 47,996 cf

Plug-Flow detention time= 356.2 min calculated for 54,513 cf (60% of inflow) Center-of-Mass det. time= 211.4 min (1,001.6 - 790.2)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 9,112 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 15,592 cf | 63.25'W x 281.30'L x 3.50'H Field A |
| | | | 62,272 cf Overall - 23,292 cf Embedded = 38,980 cf x 40.0% Voids |
| #3A | 96.17' | 23,292 cf | ADS_StormTech SC-740 +Cap x 507 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 507 Chambers in 13 Rows |
| | | 17.000 of | Total Available Starsas |

47,996 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevation | Surf.Area | Voids | Inc.Store | Cum.Store |
|-----------|-----------|-------|--------------|--------------|
| (feet) | (sq-ft) | (%) | (cubic-feet) | (cubic-feet) |
| 96.17 | 15,820 | 0.0 | 0 | 0 |
| 97.67 | 15,820 | 35.0 | 8,306 | 8,306 |
| 97.83 | 15,820 | 15.0 | 380 | 8,685 |
| 98.01 | 15,820 | 15.0 | 427 | 9,112 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|---|
| #1 | Primary | 92.07' | 0.5" Vert. Restriction Orifice C= 0.600 |
| | - | | Limited to weir flow at low heads |
| #2 | Device 1 | 92.17' | 6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 |
| | | | Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 '/' Cc= 0.900 |
| | | | n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92.17' | 0.9" x 0.1" Horiz. Perforations X 400.00 columns |
| | | | X 3 rows C= 0.600 Limited to weir flow at low heads |
| #4 | Secondary | 98.00' | 3.0' long x 2.0' breadth Broad-Crested Rectangular Weir |
| | | | Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 |
| | | | 2.50 3.00 3.50 |
| | | | Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 |
| | | | 2.85 3.07 3.20 3.32 |

Primary OutFlow Max=0.02 cfs @ 12.32 hrs HW=99.21' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 12.85 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.51 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 9.58 cfs potential flow)

Secondary OutFlow Max=10.80 cfs @ 12.32 hrs HW=99.21' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 10.80 cfs @ 2.97 fps)

Pond 8P: Underground Storage w/ Porous Pavement 4 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

39 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 279.30' Row Length +12.0" End Stone x 2 = 281.30' Base Length
13 Rows x 51.0" Wide + 6.0" Spacing x 12 + 12.0" Side Stone x 2 = 63.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

507 Chambers x 45.9 cf = 23,291.6 cf Chamber Storage

62,272.0 cf Field - 23,291.6 cf Chambers = 38,980.5 cf Stone x 40.0% Voids = 15,592.2 cf Stone Storage

Chamber Storage + Stone Storage = 38,883.8 cf = 0.893 af Overall Storage Efficiency = 62.4% Overall System Size = 281.30' x 63.25' x 3.50'

507 Chambers 2,306.4 cy Field 1,443.7 cy Stone



Pond 8P: Underground Storage w/ Porous Pavement 4

Summary for Pond 9P: Proposed Rain Garden 3 (North East)

[93] Warning: Storage range exceeded by 0.52'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

[62] Hint: Exceeded Reach 2R OUTLET depth by 0.23' @ 12.20 hrs

Inflow Area = 19,898 sf, 48.83% Impervious, Inflow Depth = 10.65" for 100-Year 2100 event 4.58 cfs @ 12.19 hrs, Volume= Inflow = 17,665 cf 4.64 cfs @ 12.19 hrs, Volume= 0.38 cfs @ 12.19 hrs, Volume= = Outflow 17,521 cf, Atten= 0%, Lag= 0.1 min Primarv = 8.484 cf Routed to Pond 10P : Underground Storage w/ Porous Pavement 5 4.26 cfs @ 12.19 hrs, Volume= Secondary = 9.037 cf Routed to Pond 10P : Underground Storage w/ Porous Pavement 5

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.77' @ 12.19 hrs Surf.Area= 1,670 sf Storage= 1,751 cf

Plug-Flow detention time= 180.0 min calculated for 17,509 cf (99% of inflow) Center-of-Mass det. time= 176.5 min (944.5 - 768.0)

| Volume | Invert | Avai | I.Stora | age Storage Descr | iption | | | |
|--|----------------------------|--|---------------------------------------|--|---|--|---|--|
| #1 | 98.25' | | 1,75 | 1 cf Custom Stage | e Data (Conic)Listed | below (Recalc) | | |
| Elevatio (fee | on Su et) | rf.Area (sq-ft) | Void %) | s Inc.Store) (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) | | |
| 98.2 99.2 99.5 100.0 100.2 | 25 25 50 00 25 | 1,385 1,385 1,385 1,385 1,670 1,670 | 0.0 35.0 25.0 100.0 100.0 | 0 0 0 485 0 87 0 763 0 418 | 0 485 571 1,334 1,751 | 1,385 1,517 1,550 1,843 1,879 | | |
| Device | Routing | ١n | vert | Outlet Devices | | | | |
| #1 | Primary | 98. | .15' | 4.0" Round Culver Inlet / Outlet Invert= n= 0.020 Corrugate | t L= 11.0' Ke= 0.5 98.15' / 98.09' S= d PE_corrugated int | 00 0.0055 '/' Cc= 0.900 terior Flow Area= 0.09 sf | | |
| #2 | Device 1 | 98. | .15' | 0.5" Vert. Restrictive Orifice C= 0.600 | | | | |
| #3 | Device 2 | 98. | .25' | 4.0" Round 4" HDF Inlet / Outlet Invert= n= 0.020 Corrugate | PE Underdrain L= 2 98.25' / 98.15' S= d PE, corrugated int | 20.0' Ke= 0.500 0.0050 '/' Cc= 0.900 terior. Flow Area= 0.09 sf | | |
| #4 | Device 3 | 98. | .25' | 0.9" x 0.1" Horiz. P X 3 rows C= 0 600 | erforations X 400.0 | 0 columns at low heads | | |
| #5 | Device 1 | 100. | .00' | 4.0" Horiz. Drainted | ch Atrium C= 0.60 | 0 | | |
| #6 | Secondary | 100. | .10' | 3.0' long x 2.0' bre Head (feet) 0.20 0. 2.50 3.00 3.50 Coef. (English) 2.54 2.85 3.07 3.20 3.3 | adth Broad-Creste 40 0.60 0.80 1.00 4 2.61 2.61 2.60 2 2 | d Rectangular Weir 1.20 1.40 1.60 1.80 2.0 .66 2.70 2.77 2.89 2.88 | 0 | |

Primary OutFlow Max=0.38 cfs @ 12.19 hrs HW=100.76' (Free Discharge) 1=Culvert (Passes 0.38 cfs of 0.48 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.75 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.38 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.72 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.37 cfs @ 4.20 fps)

Secondary OutFlow Max=4.21 cfs @ 12.19 hrs HW=100.76' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 4.21 cfs @ 2.12 fps)



Pond 9P: Proposed Rain Garden 3 (North East)

Summary for Pond 10P: Underground Storage w/ Porous Pavement 5

[44] Hint: Outlet device #3 is below defined storage

[93] Warning: Storage range exceeded by 0.25'

[79] Warning: Submerged Pond 9P Primary device # 1 INLET by 1.27'

| Inflow Area = | 78,061 sf, 72.85% Impervious, | Inflow Depth > 11.14" for 100-Year 2100 eve | ent |
|---------------|--------------------------------|---|-----|
| Inflow = | 18.45 cfs @ 12.19 hrs, Volume= | 72,480 cf | |
| Outflow = | 14.17 cfs @ 12.30 hrs, Volume= | 45,783 cf, Atten= 23%, Lag= 6.8 min | |
| Primary = | 0.02 cfs @ 12.30 hrs, Volume= | 3,976 cf | |
| Secondary = | 14.16 cfs @ 12.30 hrs, Volume= | 41,807 cf | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 99.42' @ 12.30 hrs Surf.Area= 27,852 sf Storage= 34,467 cf

Plug-Flow detention time= 345.5 min calculated for 45,751 cf (63% of inflow) Center-of-Mass det. time= 207.3 min (1,005.6 - 798.3)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 9,426 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 10,110 cf | 63.25'W x 181.62'L x 3.50'H Field A |
| | | | 40,205 cf Overall - 14,931 cf Embedded = 25,275 cf x 40.0% Voids |
| #3A | 96.17' | 14,931 cf | ADS_StormTech SC-740 +Cap x 325 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 325 Chambers in 13 Rows |
| | | 24 467 of | Total Available Starsas |

34,467 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevation | Surf.Area | Voids | Inc.Store | Cum.Store |
|-----------|-----------|-------|--------------|--------------|
| (feet) | (sq-ft) | (%) | (cubic-feet) | (cubic-feet) |
| 96.17 | 16,365 | 0.0 | 0 | 0 |
| 97.67 | 16,365 | 35.0 | 8,592 | 8,592 |
| 97.83 | 16,365 | 15.0 | 393 | 8,984 |
| 98.01 | 16,365 | 15.0 | 442 | 9,426 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|---|
| #1 | Primary | 92.07' | 0.5" Vert. Restriction Orifice C= 0.600 |
| | - | | Limited to weir flow at low heads |
| #2 | Device 1 | 92.17' | 6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 |
| | | | Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 '/' Cc= 0.900 |
| | | | n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92.17' | 0.9" x 0.1" Horiz. Perforations X 400.00 columns |
| | | | X 3 rows C= 0.600 Limited to weir flow at low heads |
| #4 | Secondary | 98.00' | 3.0' long x 2.0' breadth Broad-Crested Rectangular Weir |
| | | | Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 |
| | | | 2.50 3.00 3.50 |
| | | | Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 |
| | | | 2.85 3.07 3.20 3.32 |

Primary OutFlow Max=0.02 cfs @ 12.30 hrs HW=99.40' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 13.02 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.51 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 9.71 cfs potential flow)

Secondary OutFlow Max=13.88 cfs @ 12.30 hrs HW=99.41' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 13.88 cfs @ 3.29 fps)

Pond 10P: Underground Storage w/ Porous Pavement 5 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

25 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 179.62' Row Length +12.0" End Stone x 2 = 181.62' Base Length 13 Rows x 51.0" Wide + 6.0" Spacing x 12 + 12.0" Side Stone x 2 = 63.25' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

325 Chambers x 45.9 cf = 14,930.5 cf Chamber Storage

40,205.4 cf Field - 14,930.5 cf Chambers = 25,274.9 cf Stone x 40.0% Voids = 10,110.0 cf Stone Storage

Chamber Storage + Stone Storage = 25,040.5 cf = 0.575 af Overall Storage Efficiency = 62.3% Overall System Size = 181.62' x 63.25' x 3.50'

325 Chambers 1,489.1 cy Field 936.1 cy Stone





Summary for Pond 11P: Proposed Rain Garden 2 (East)

[93] Warning: Storage range exceeded by 0.73'

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=8)

| Inflow Area | a = | 32,033 sf, | 45.19% Ir | npervious, | Inflow Depth = 10.5 | 56" for 10 | 0-Year _21 | 00 event |
|-------------|---------|--------------|-------------|------------|---------------------|------------|------------|----------|
| Inflow | = | 6.91 cfs @ | 12.21 hrs, | Volume= | 28,199 cf | | | |
| Outflow | = | 6.91 cfs @ | 12.23 hrs, | Volume= | 27,959 cf, A | Atten= 0%, | Lag= 0.7 m | nin |
| Primary | = | 0.44 cfs @ | 12.23 hrs, | Volume= | 11,675 cf | | - | |
| Routed | to Pond | 12P : Underg | ground Stor | age w/ Por | rous Pavement 6 | | | |
| Secondary | / = | 6.48 cfs @ | 12.23 hrs, | Volume= | 16,284 cf | | | |
| Routed | to Pond | 12P : Underg | ground Stor | age w/ Por | rous Pavement 6 | | | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.98' @ 12.23 hrs Surf.Area= 3,045 sf Storage= 3,267 cf

Plug-Flow detention time= 214.0 min calculated for 27,959 cf (99% of inflow) Center-of-Mass det. time= 208.4 min (980.1 - 771.8)

| Volume | Invert | Avai | I.Stor | age | Storage Descript | tion | |
|----------|-----------|---------|--------|--|---|--|--|
| #1 | 98.25' | | 3,26 | 7 cf | Custom Stage | Data (Conic)Listed | below (Recalc) |
| Elevatio | on Su | rf.Area | Void | s | Inc.Store | Cum.Store | Wet.Area |
| (fee | et) | (sq-ft) | (% |) | (cubic-feet) | (cubic-feet) | <u>(sq-ft)</u> |
| 98.2 | 25 | 2,635 | 0. | 0 | 0 | 0 | 2,635 |
| 99.2 | 25 | 2,635 | 35. | 0 | 922 | 922 | 2,817 |
| 99.5 | 50 | 2,635 | 25. | 0 | 165 | 1,087 | 2,862 |
| 100.0 | 00 | 3,045 | 100. | 0 | 1,419 | 2,506 | 3,283 |
| 100.2 | 25 | 3,045 | 100. | 0 | 761 | 3,267 | 3,332 |
| Device | Routing | ١n | vert | Outle | et Devices | | |
| #1 | Primary | 98. | .15' | 4.0" Inlet n= 0 | Round Culvert / Outlet Invert= 98 .020 Corrugated | L= 11.0' Ke= 0.50 8.15' / 98.09' S= 0 PE, corrugated into | 00).0055 '/' Cc= 0.900 erior, Flow Area= 0.09 sf |
| #2 | Device 1 | 98. | .15' | 0.7" Vert. Restrictive Orifice C= 0.600 | | | |
| #3 | Device 2 | 98. | .25' | 4.0 " Inlet n= 0 | Round 4" HDPE / Outlet Invert= 98 .020 Corrugated | E Underdrain L= 2 8.25' / 98.15' S= (PE, corrugated inte | 0.0' Ke= 0.500).0050 '/' Cc= 0.900 erior, Flow Area= 0.09 sf |
| #4 | Device 3 | 98. | .25' | 0.9 " X 3 I | x 0.1" Horiz. Per | forations X 400.00 |) columns at low heads |
| #5 | Device 1 | 100. | .00' | 4.0'' Limit | Horiz. Draintech | Atrium C= 0.600 |) |
| #6 | Secondary | 100. | .10' | 3.0' Head 2.50 Coet 2.85 | long x 2.0' breac d (feet) 0.20 0.40 3.00 3.50 f. (English) 2.54 3.07 3.20 3.32 | Ith Broad-Crested 0 0.60 0.80 1.00 2.61 2.61 2.60 2. | I Rectangular Weir 1.20 1.40 1.60 1.80 2.00 66 2.70 2.77 2.89 2.88 |

Primary OutFlow Max=0.43 cfs @ 12.23 hrs HW=100.97' (Free Discharge) 1=Culvert (Passes 0.43 cfs of 0.50 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.02 cfs @ 8.04 fps) 3=4" HDPE Underdrain (Passes 0.02 cfs of 0.39 cfs potential flow) 4=Perforations (Passes 0.02 cfs of 5.95 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.41 cfs @ 4.73 fps)

Secondary OutFlow Max=6.33 cfs @ 12.23 hrs HW=100.97' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 6.33 cfs @ 2.44 fps)



Pond 11P: Proposed Rain Garden 2 (East)

Summary for Pond 12P: Underground Storage w/ Porous Pavement 6

[44] Hint: Outlet device #3 is below defined storage[79] Warning: Submerged Pond 11P Primary device # 1 INLET by 0.41'

| Inflow Area = | 32,033 sf, 45.19% Impervious, | Inflow Depth > 10.47" 1 | for 100-Year _2100 event |
|---------------|-------------------------------|-------------------------|--------------------------|
| Inflow = | 6.91 cfs @ 12.23 hrs, Volume= | 27,959 cf | |
| Outflow = | 3.31 cfs @ 12.44 hrs, Volume= | 18,304 cf, Atten= | : 52%, Lag= 13.1 min |
| Primary = | 0.02 cfs @ 12.44 hrs, Volume= | 3,804 cf | - |
| Secondary = | 3.29 cfs @ 12.44 hrs, Volume= | 14,500 cf | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 98.56' @ 12.44 hrs Surf.Area= 8,364 sf Storage= 11,644 cf

Plug-Flow detention time= 481.3 min calculated for 18,291 cf (65% of inflow) Center-of-Mass det. time= 227.9 min (1,208.0 - 980.1)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|---|
| #1 | 96.17' | 1,866 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 4,603 cf | 25.25'W x 202.98'L x 3.50'H Field A |
| | | | 17,938 cf Overall - 6,432 cf Embedded = 11,506 cf x 40.0% Voids |
| #3A | 96.17' | 6,432 cf | ADS_StormTech SC-740 +Cap x 140 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 140 Chambers in 5 Rows |
| | | 12 000 of | Total Available Storage |

12,900 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void %) | s Inc.Store b) (cubic-feet) | Cum.Store (cubic-feet) | |
|------------------|-----------|----------------------|------------|--------------------------------|---------------------------|------------------------------|
| 96.1 | 17 | 3,239 | 0. | 0 0 | 0 | |
| 97.6 | 67 | 3,239 | 35. | 0 1,700 | 1,700 | |
| 97.8 | 33 | 3,239 | 15. | 0 78 | 1,778 | |
| 98.0 |)1 | 3,239 | 15. | 0 87 | 1,866 | |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | on Orifice C= 0. | 600 |
| | - | | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | PE Underdrain L | = 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | = 92.17' / 90.37' S | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. F | Perforations X 40 | 0.00 columns |
| | | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bre | eadth Broad-Cres | ted Rectangular Weir |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | | |
| | | | | Coef. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3.3 | 32 | |

Primary OutFlow Max=0.02 cfs @ 12.44 hrs HW=98.56' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 12.25 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.48 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 9.13 cfs potential flow)

Secondary OutFlow Max=3.27 cfs @ 12.44 hrs HW=98.56' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 3.27 cfs @ 1.95 fps)

Pond 12P: Underground Storage w/ Porous Pavement 6 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

28 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 200.98' Row Length +12.0" End Stone x 2 = 202.98' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

140 Chambers x 45.9 cf = 6,431.6 cf Chamber Storage

17,938.1 cf Field - 6,431.6 cf Chambers = 11,506.5 cf Stone x 40.0% Voids = 4,602.6 cf Stone Storage

Chamber Storage + Stone Storage = 11,034.2 cf = 0.253 af Overall Storage Efficiency = 61.5% Overall System Size = 202.98' x 25.25' x 3.50'

140 Chambers 664.4 cy Field 426.2 cy Stone



Pond 12P: Underground Storage w/ Porous Pavement 6

Summary for Link 1L: Offsite Flows

| Inflow <i>i</i> | Area = | 927,363 sf, | 3.35% Impervious, | Inflow Depth = 8.84" | ' for 100-Year _2100 event |
|-----------------|--------|--------------|--------------------|----------------------|----------------------------|
| Inflow | = | 132.65 cfs @ | 12.31 hrs, Volume= | 683,460 cf | |
| Primar | y = | 132.65 cfs @ | 12.31 hrs, Volume= | 683,460 cf, Atte | en= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Link 1L: Offsite Flows

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| Subcatchment1S: DA1: CN w/ IC | Runoff Area=56,173 sf 73.47% Impervious Runoff Depth=7.97" Flow Length=361' Tc=14.3 min CN=75/98 Runoff=8.82 cfs 37,290 cf |
|------------------------------------|--|
| Subcatchment 1Sa: Existing RG 1_\ | Nest_ Runoff Area=22,637 sf 64.43% Impervious Runoff Depth=7.80" Flow Length=361' Tc=14.3 min CN=77/98 Runoff=3.52 cfs 14,714 cf |
| Subcatchment1Sb: DA1: CN w/ IC | Runoff Area=39,105 sf 68.25% Impervious Runoff Depth=7.82" Flow Length=361' Tc=14.3 min CN=75/98 Runoff=6.07 cfs 25,482 cf |
| Subcatchment2S: DA 2: CN w/ IC a | reas Runoff Area=58,249 sf 86.46% Impervious Runoff Depth=8.35" Flow Length=391' Tc=7.0 min CN=76/98 Runoff=11.82 cfs 40,516 cf |
| Subcatchment3S: DA 3: CN w/ IC | Runoff Area=158,623 sf 63.48% Impervious Runoff Depth=7.73" Flow Length=441' Tc=8.3 min CN=76/98 Runoff=29.52 cfs 102,192 cf |
| Subcatchment3Sa: Existing RG 2 F | ront DA Runoff Area=25,889 sf 48.62% Impervious Runoff Depth=7.52" Tc=8.3 min CN=79/98 Runoff=4.77 cfs 16,228 cf |
| Subcatchment3Sb: RG 1 DA | Runoff Area=21,388 sf 65.14% Impervious Runoff Depth=7.69" Flow Length=441' Tc=8.3 min CN=74/98 Runoff=3.95 cfs 13,706 cf |
| Subcatchment3Sc: DA 3: CN w/ IC | areas Runoff Area=111,346 sf 66.62% Impervious Runoff Depth=7.77" Flow Length=441' Tc=8.3 min CN=75/98 Runoff=20.75 cfs 72,134 cf |
| Subcatchment4S: DA 4: CN w/ IC | Runoff Area=86,816 sf 90.62% Impervious Runoff Depth=8.45" Flow Length=143' Tc=8.4 min CN=75/98 Runoff=16.96 cfs 61,108 cf |
| Subcatchment4Sa: RG 4 DA | Runoff Area=24,369 sf 57.53% Impervious Runoff Depth=7.73" Flow Length=143' Tc=8.4 min CN=79/98 Runoff=4.54 cfs 15,693 cf |
| Subcatchment4Sb: DA 4: CN w/ IC | areas Runoff Area=72,797 sf 88.81% Impervious Runoff Depth=8.40" Flow Length=143' Tc=8.4 min CN=75/98 Runoff=14.17 cfs 50,933 cf |
| Subcatchment5S: DA 5: CN w/ IC | Runoff Area=78,058 sf 72.85% Impervious Runoff Depth=8.02" Flow Length=310' Tc=11.5 min CN=77/98 Runoff=13.33 cfs 52,139 cf |
| Subcatchment5Sa: RG 3 DA | Runoff Area=19,898 sf 48.83% Impervious Runoff Depth=7.53" Flow Length=310' Tc=11.5 min CN=79/98 Runoff=3.29 cfs 12,481 cf |
| Subcatchment5Sb: DA 5: CN w/ IC | areas Runoff Area=58,163 sf 81.07% Impervious Runoff Depth=8.18" Flow Length=310' Tc=11.5 min CN=75/98 Runoff=10.03 cfs 39,643 cf |
| Subcatchment6S: DA 6: CN w/ IC a | reas Runoff Area=32,033 sf 45.19% Impervious Runoff Depth=7.44" Flow Length=276' Tc=14.0 min CN=79/98 Runoff=4.92 cfs 19,868 cf |
| Subcatchment 7S: DA 7 (Offsite Sou | uth): Runoff Area=107,001 sf 18.84% Impervious Runoff Depth=6.73" Flow Length=309' Tc=14.5 min CN=78/98 Runoff=15.19 cfs 60,044 cf |

Site1HillsboroughMunicpComplex 202406NOAA 24-hr C 100-Year _Current Rainfall=8.95" Prepared by Rutgers Cooperative Extension Water Resources Program Printed 6/29/2024 HydroCAD® 10.10-7c s/n 03601 © 2022 HydroCAD Software Solutions LLC Page 321 Subcatchment 8S: DA 8 (Offsite North): CN Runoff Area=340,642 sf 1.94% Impervious Runoff Depth=5.84" Flow Length=976' Tc=19.4 min CN=74/98 Runoff=38.58 cfs 165,783 cf Runoff Area=479,720 sf 0.89% Impervious Runoff Depth=5.69" Subcatchment9S: DA 9 (Offsite Field Flow Length=1,468' Tc=30.4 min CN=73/98 Runoff=42.84 cfs 227,369 cf Subcatchment 31S: RG 2 DA Runoff Area=32,035 sf 32.46% Impervious Runoff Depth=7.15" Flow Length=276' Tc=14.0 min CN=79/98 Runoff=4.81 cfs 19,083 cf Avg. Flow Depth=0.34' Max Vel=2.61 fps Inflow=3.52 cfs 14,714 cf Reach 1R: Existing Bioswale West 1 n=0.035 L=33.0' S=0.0227 '/' Capacity=7.36 cfs Outflow=3.50 cfs 14,714 cf Avg. Flow Depth=0.46' Max Vel=3.05 fps Inflow=3.29 cfs 12,481 cf Reach 2R: Bioswale E 1 RG 3 n=0.035 L=35.0' S=0.0286 '/' Capacity=4.02 cfs Outflow=3.27 cfs 12,481 cf Pond 1P: Exising Rain Garden 1 West Peak Elev=100.66' Storage=1,831 cf Inflow=3.50 cfs 14,714 cf Primary=0.35 cfs 7,571 cf Secondary=3.24 cfs 6,962 cf Outflow=3.59 cfs 14,532 cf Pond 2P: Underground Storage w/ Porous Peak Elev=98.49' Storage=21,820 cf Inflow=9.60 cfs 40,014 cf Primary=0.02 cfs 3,923 cf Secondary=2.69 cfs 18,608 cf Outflow=2.71 cfs 22,531 cf Pond 3P: Underground Storage w/ Porous Peak Elev=98.43' Storage=25,186 cf Inflow=11.82 cfs 40,516 cf Primary=0.02 cfs 3,938 cf Secondary=2.25 cfs 16,279 cf Outflow=2.26 cfs 20,217 cf Peak Elev=101.76' Storage=3,267 cf Inflow=4.77 cfs 16,228 cf Pond 4P: Existing Rain Garden 2 Front Primary=0.38 cfs 7,457 cf Secondary=4.19 cfs 7,622 cf Outflow=4.57 cfs 15,079 cf Pond 5P: Proposed Rain Garden 1 (South Peak Elev=101.70' Storage=2,466 cf Inflow=3.95 cfs 13,706 cf Primary=0.36 cfs 6,965 cf Secondary=3.60 cfs 6,176 cf Outflow=3.96 cfs 13,141 cf Pond 6P: Underground Storage w/ Peak Elev=98.51' Storage=63,177 cf Inflow=29.28 cfs 100,354 cf Primary=0.02 cfs 3,954 cf Secondary=2.86 cfs 42,135 cf Outflow=2.88 cfs 46,089 cf Pond 7P: Proposed Rain Garden 4 (North) Peak Elev=100.74' Storage=2,453 cf Inflow=4.54 cfs 15,693 cf Primary=0.37 cfs 7,590 cf Secondary=4.05 cfs 7,163 cf Outflow=4.42 cfs 14,753 cf Pond 8P: Underground Storage w/ Porous Peak Elev=98.40' Storage=42,317 cf Inflow=18.59 cfs 65,687 cf Primary=0.02 cfs 3,954 cf Secondary=1.99 cfs 24,818 cf Outflow=2.00 cfs 28,773 cf Pond 9P: Proposed Rain Garden 3 (North Peak Elev=100.63' Storage=1,751 cf Inflow=3.27 cfs 12,481 cf Primary=0.34 cfs 6,695 cf Secondary=2.98 cfs 5,645 cf Outflow=3.33 cfs 12,339 cf Pond 10P: Underground Storage w/ Peak Elev=98.47' Storage=31,164 cf Inflow=13.35 cfs 51,982 cf Primary=0.02 cfs 3,948 cf Secondary=2.49 cfs 21,343 cf Outflow=2.51 cfs 25,292 cf Pond 11P: Proposed Rain Garden 2 (East) Peak Elev=100.80' Storage=3,267 cf Inflow=4.92 cfs 19,868 cf Primary=0.40 cfs 9,603 cf Secondary=4.53 cfs 10,029 cf Outflow=4.93 cfs 19,632 cf Pond 12P: Underground Storage w/ Porous Peak Elev=98.16' Storage=10,586 cf Inflow=4.93 cfs 19.632 cf Primary=0.02 cfs 3,755 cf Secondary=0.50 cfs 6,228 cf Outflow=0.52 cfs 9.983 cf Inflow=88.88 cfs 453,197 cf

Primary=88.88 cfs 453,197 cf

Link 1L: Offsite Flows

Total Runoff Area = 1,824,942 sf Runoff Volume = 1,046,407 cf Average Runoff Depth = 6.88" 63.76% Pervious = 1,163,653 sf 36.24% Impervious = 661,289 sf

Summary for Subcatchment 1S: DA1: CN w/ IC areas_original

Runoff = 8.82 cfs @ 12.22 hrs, Volume= 37,290 cf, Depth= 7.97"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| | A | rea (sf) | CN | Description | | |
|---|-------------|------------------|-----------------|--------------------------|-------------------|--|
| * | | 2,053 | 79 | Open space | e (fair) C | |
| * | | 12,848 | 74 | Open space | e (good) C | |
| * | | 41,272 | 98 | Impervious | , | |
| | | 56,173 | 92 | Weighted A | verage | |
| 14,901 75 26.53% Pervious Area 41,272 98 73.47% Impervious Are | | | 75 | 26.53% Pervious Area | | |
| | | | 73.47% Imp | pervious Are | ea | |
| | Tc (min) | Length (feet) | Slope (ft/ft | e Velocity) (ft/sec) | Capacity (cfs) | Description |
| | 12.2 | 100 | 0.0109 | 0.14 | | Sheet Flow, Sheet flow Grass: Short n= 0.150 P2= 3.34" |
| | 0.2 | 33 | 0.0280 | 2.69 | | Shallow Concentrated Flow, SCF - unpaved Unpaved Kv= 16.1 fps |
| | 1.9 | 228 | 0.0095 | 5 1.98 | | Shallow Concentrated Flow, SCF - Paved parking lot Paved Kv= 20.3 fps |
| | 14.3 | 361 | Total | | | |

Subcatchment 1S: DA1: CN w/ IC areas_original



Summary for Subcatchment 1Sa: Existing RG 1_West_ DA

Runoff = 3.52 cfs @ 12.22 hrs, Volume= 1 Routed to Reach 1R : Existing Bioswale West 1

14,714 cf, Depth= 7.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year Current Rainfall=8.95"

| | A | rea (sf) | CN | Description | | | |
|---|-------------|------------------|------------------|---|-------------------|--|--|
| * | | 5,569 | 79 | Open space (fair) C - Portion from DA 9 the field | | | |
| * | | 14,584 | 98 | Impervious Parking Lot | | | |
| * | | 2,484 | 74 | OPen Spac | e (Good) C | C - Portion from DA1 | |
| | | 22,637 | 91 | Weighted A | verage | | |
| | | 8,053 | 77 | 35.57% Pei | rvious Area | | |
| | | 14,584 | 98 | 98 64.43% Impervious Area | | | |
| | Tc (min) | Length (feet) | Slope (ft/ft) | velocity (ft/sec) | Capacity (cfs) | Description | |
| | 12.2 | 100 | 0.0109 | 0.14 | | Sheet Flow, Sheet flow Grass: Short_n= 0.150_P2= 3.34" | |
| | 0.2 | 33 | 0.0280 | 2.69 | | Shallow Concentrated Flow, SCF - unpaved Unpaved Ky= 16.1 fps | |
| | 1.9 | 228 | 0.0095 | 5 1.98 | | Shallow Concentrated Flow, SCF - Paved parking lot Paved Kv= 20.3 fps | |
| | 44.0 | 0.04 | T . 4 . 1 | | | | |

14.3 361 Total

Subcatchment 1Sa: Existing RG 1_West_ DA


Summary for Subcatchment 1Sb: DA1: CN w/ IC areas_Remaining

Runoff = 6.07 cfs @ 12.22 hrs, Volume= 25,482 cf, Depth= 7.82" Routed to Pond 2P : Underground Storage w/ Porous Pavement 1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| | A | rea (sf) | CN | Description | | |
|----------------------------------|-------|----------|--------|-------------|-------------|--|
| * | | 2,053 | 79 | Open space | e (fair) C | |
| * | | 10,364 | 74 | Open space | e (good) C | |
| * | | 26,688 | 98 | Impervious | , | |
| _ | | 39,105 | 91 | Weighted A | verage | |
| | | 12,417 | 75 | 31.75% Pei | rvious Area | |
| 26,688 98 68.25% Impervious Area | | | | | pervious Ar | ea |
| | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | |
| | 12.2 | 100 | 0.0109 | 9 0.14 | | Sheet Flow, Sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 0.2 | 33 | 0.0280 |) 2.69 | | Shallow Concentrated Flow, SCF - unpaved |
| | | | | | | Unpaved Kv= 16.1 fps |
| | 1.9 | 228 | 0.0095 | 5 1.98 | | Shallow Concentrated Flow, SCF - Paved parking lot |
| | | | | | | Paved Kv= 20.3 fps |
| | 14.3 | 361 | Total | | | |

Subcatchment 1Sb: DA1: CN w/ IC areas_Remaining



Summary for Subcatchment 2S: DA 2: CN w/ IC areas

Runoff = 11.82 cfs @ 12.14 hrs, Volume= 40,516 cf, Depth= 8.35" Routed to Pond 3P : Underground Storage w/ Porous Pavement 2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| _ | A | rea (sf) | CN | Description | | |
|----------------------------------|-------|----------|--------|-------------|-------------|--|
| * | | 3,767 | 79 | Open space | e (Fair) C | |
| * | | 4,118 | 74 | Open Spac | e (good) C | |
| * | | 50,364 | 98 | Impervious | , | |
| 58,249 95 Weighted Average | | | | Weighted A | verage | |
| 7,885 76 13.54% Pervious Area | | | | | | |
| 50,364 98 86.46% Impervious Area | | | | | pervious Ar | ea |
| | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description |
| _ | (min) | (feet) | (ft/ft | i) (ft/sec) | (cfs) | |
| | 4.8 | 18 | 0.0037 | 7 0.06 | | Sheet Flow, Sheet flow - grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 2.2 | 373 | 0.0186 | 6 2.77 | | Shallow Concentrated Flow, SCF _ paved |
| _ | | | | | | Paved Kv= 20.3 fps |
| | 7.0 | 391 | Total | | | |

Subcatchment 2S: DA 2: CN w/ IC areas



Summary for Subcatchment 3S: DA 3: CN w/ IC areas_Original

Runoff = 29.52 cfs @ 12.15 hrs, Volume= 102,192 cf, Depth= 7.73"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| _ | A | rea (sf) | CN | Description | | | | | |
|---|---------|----------|--------|----------------------|-------------|--|--|--|--|
| * | | 18,715 | 79 | Open space | e (Fair) C | | | | |
| * | | 39,208 | 74 | Open space | e (good) C | | | | |
| * | 1 | 00,700 | 98 | Impervious | (0) | | | | |
| _ | 1 | 58,623 | 90 | Weighted Average | | | | | |
| | | 57,923 | 76 | 36.52% Pervious Area | | | | | |
| | 100,700 | | 98 | 63.48% Imp | pervious Ar | ea | | | |
| | | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | |
| _ | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | | | |
| | 5.8 | 83 | 0.0489 | 0.24 | | Sheet Flow, sheet flow - grass | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| | 2.5 | 358 | 0.0138 | 3 2.38 | | Shallow Concentrated Flow, SCF - paved | | | |
| | | | | | | Paved Kv= 20.3 fps | | | |
| _ | 8.3 | 441 | Total | | | | | | |

Subcatchment 3S: DA 3: CN w/ IC areas_Original



Summary for Subcatchment 3Sa: Existing RG 2 Front DA

Runoff = 4.77 cfs @ 12.15 hrs, Volume= 16,228 cf, Depth= 7.52" Routed to Pond 4P : Existing Rain Garden 2 Front

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| | Area (sf) | CN | Description | | | | |
|----|--------------------------|--------------|---|--|--|--|--|
| * | 6,507 | 98 | mpervious Roof Top | | | | |
| * | 966 | 98 | Gravel surface, HSG C - Path | | | | |
| * | 5,114 | 98 | npervious Sidewalk | | | | |
| | 13,302 | 79 | 50-75% Grass cover, Fair, HSG C | | | | |
| | 25,889 | 88 | Weighted Average | | | | |
| | 13,302 | 79 | 51.38% Pervious Area | | | | |
| | 12,587 | 98 | 48.62% Impervious Area | | | | |
| (n | Tc Length nin) (feet) | Slop (ft/ | pe Velocity Capacity Description (ft) (ft/sec) (cfs) | | | | |
| | 8.3 | | Direct Entry, | | | | |





Summary for Subcatchment 3Sb: RG 1 DA

Runoff = 3.95 cfs @ 12.15 hrs, Volume= 13,706 cf, Depth= 7.69" Routed to Pond 5P : Proposed Rain Garden 1 (South West)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| | A | rea (sf) | CN | Description | | | | | | |
|-------------------------------|---------------------------------|----------|--------|-------------|----------------------|--|--|--|--|--|
| * | | 7,455 | 74 | Open space | Open space (good) C | | | | | |
| * | | 10,303 | 98 | Impervious | npervious - Roof top | | | | | |
| * | | 3,630 | 98 | Impervious | - Road / Si | dewalk | | | | |
| | | 21,388 | 90 | Weighted A | verage | | | | | |
| 7,455 74 34.86% Pervious Area | | | | | | | | | | |
| | 13,933 98 65.14% Impervious Are | | | | pervious Ar | ea | | | | |
| | | | | - | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | | |
| | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | | | | |
| | 5.8 | 83 | 0.048 | 9 0.24 | | Sheet Flow, sheet flow - grass | | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | | |
| | 2.5 | 358 | 0.013 | 3 2.38 | | Shallow Concentrated Flow, SCF - paved | | | | |
| | | | | | | Paved Kv= 20.3 fps | | | | |
| | 8.3 | 441 | Total | | | | | | | |

Subcatchment 3Sb: RG 1 DA



Summary for Subcatchment 3Sc: DA 3: CN w/ IC areas Remaining

Runoff = 20.75 cfs @ 12.15 hrs, Volume= 72,134 cf, Depth= 7.77" Routed to Pond 6P : Underground Storage w/ Porous Pavement 3

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| | A | rea (sf) | CN | Description | | | | | |
|---|---------------------------------|----------|--------|----------------------|--------------|--|--|--|--|
| * | | 5,413 | 79 | Open space | e (Fair) C | | | | |
| * | | 31,753 | 74 | Open space | e (good) C | | | | |
| * | | 74,180 | 98 | Impervious | (0) | | | | |
| _ | 1 | 11,346 | 90 | Weighted A | verage | | | | |
| | 37.166 75 | | | 33.38% Pervious Area | | | | | |
| | 74,180 98 66.62% Impervious Are | | | | pervious Are | ea | | | |
| | | | | - | | | | | |
| | Tc | Length | Slope | e Velocity | Capacity | Description | | | |
| | (min) | (feet) | (ft/ft |) (ft/sec) | (cfs) | | | | |
| | 5.8 | 83 | 0.0489 | 9 0.24 | | Sheet Flow, sheet flow - grass | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | |
| | 2.5 | 358 | 0.0138 | 3 2.38 | | Shallow Concentrated Flow, SCF - paved | | | |
| | | | | | | Paved Kv= 20.3 fps | | | |
| | 8.3 | 441 | Total | | | | | | |

Subcatchment 3Sc: DA 3: CN w/ IC areas Remaining



Summary for Subcatchment 4S: DA 4: CN w/ IC areas_original

Runoff = 16.96 cfs @ 12.15 hrs, Volume= 61,108 cf, Depth= 8.45"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| | A | rea (sf) | CN | Description | | | | | | |
|---|----------------------------|----------|--------|-------------|---------------------|--|--|--|--|--|
| * | | 1,403 | 79 | Open space | e (fair) C | | | | | |
| * | | 446 | 84 | Open space | Dpen space (fair) D | | | | | |
| * | | 6,298 | 74 | Open space | e (good) C | | | | | |
| * | | 78,669 | 98 | Impervious | | | | | | |
| | 86,816 96 Weighted Average | | | | | | | | | |
| | | 8,147 | 75 | 9.38% Perv | vious Area | | | | | |
| | | 78,669 | 98 | 90.62% Imp | pervious Are | ea | | | | |
| | | | | | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | | |
| | (min) | (feet) | (ft/ft | t) (ft/sec) | (cfs) | | | | | |
| | 7.9 | 67 | 0.0144 | 4 0.14 | | Sheet Flow, sheet flow - grass | | | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | | | |
| | 0.5 | 76 | 0.015 | 5 2.53 | | Shallow Concentrated Flow, SCF - Paved | | | | |
| _ | | | | | | Paved Kv= 20.3 fps | | | | |
| | 8.4 | 143 | Total | | | | | | | |

Subcatchment 4S: DA 4: CN w/ IC areas_original



Hydrograph

Summary for Subcatchment 4Sa: RG 4 DA

Runoff = 4.54 cfs @ 12.15 hrs, Volume= 15,693 cf, Depth= 7.73" Routed to Pond 7P : Proposed Rain Garden 4 (North)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| _ | A | rea (sf) | CN | Description | | | | | |
|---------------------------------|-------|----------|-----------|-------------------------------|----------|---|--|--|--|
| * | | 10,350 | 79 | Open space (fair) C from DA 8 | | | | | |
| * | | 14,019 | 98 | 3 Impervious Parkinglot | | | | | |
| 24,369 90 Weighted Average | | | | | | | | | |
| 10,350 79 42.47% Pervious Area | | | | | | | | | |
| 14,019 98 57.53% Impervious Are | | | | | | ea | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description | | | |
| | (min) | (feet) | (ft/ft) |) (ft/sec) | (cfs) | | | | |
| | 7.9 | 67 | 0.0144 | 0.14 | | Sheet Flow, sheet flow - grass | | | |
| | 0.5 | 76 | 0.0155 | 5 2.53 | | Grass: Short n= 0.150 P2= 3.34" Shallow Concentrated Flow, SCF - Paved | | | |
| _ | | | | | | Paved Kv= 20.3 fps | | | |
| | 0.4 | 4 4 0 | T . 4 . 1 | | | | | | |

8.4 143 Total

Subcatchment 4Sa: RG 4 DA



Summary for Subcatchment 4Sb: DA 4: CN w/ IC areas

Runoff = 14.17 cfs @ 12.15 hrs, Volume= 50,933 cf, Depth= 8.40" Routed to Pond 8P : Underground Storage w/ Porous Pavement 4

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| _ | A | rea (sf) | CN | Description | | |
|-------------------------------|-------|----------|--------|-------------|-------------|--|
| * | | 1,403 | 79 | Open space | e (fair) C | |
| * | | 446 | 84 | Open space | e (fair) D | |
| * | | 6,298 | 74 | Open space | e (good) C | |
| * | | 64,650 | 98 | Impervious | | |
| 72,797 95 Weighted Average | | | | | verage | |
| 8,147 75 11.19% Pervious Area | | | | | | |
| | | 64,650 | 98 | 88.81% Imp | pervious Ar | ea |
| | | | | | | |
| | Tc | Length | Slope | e Velocity | Capacity | Description |
| _ | (min) | (feet) | (ft/ft | :) (ft/sec) | (cfs) | |
| | 7.9 | 67 | 0.0144 | 4 0.14 | | Sheet Flow, sheet flow - grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 0.5 | 76 | 0.015 | 5 2.53 | | Shallow Concentrated Flow, SCF - Paved |
| _ | | | | | | Paved Kv= 20.3 fps |
| | 8.4 | 143 | Total | | | |

Subcatchment 4Sb: DA 4: CN w/ IC areas



Summary for Subcatchment 5S: DA 5: CN w/ IC areas_Original

Runoff = 13.33 cfs @ 12.19 hrs, Volume= 52,139 cf, Depth= 8.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| | A | rea (sf) | CN | Description | | |
|---|--|----------|---------|-------------|------------|--|
| * | | 11,294 | 79 | Open Spac | e (Fair) C | |
| * | | 9,899 | 74 | Open Spac | e (good) C | |
| * | | 56,865 | 98 | Impervious | , | |
| | | 78,058 | 92 | Weighted A | verage | |
| | 21,193 77 27.15% Pervious Area 56,865 98 72.85% Impervious Area | | | | | |
| | | | | | | ea |
| | | | | | | |
| | Тс | Length | Slope | e Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft) |) (ft/sec) | (cfs) | |
| | 8.7 | 64 | 0.0105 | 0.12 | | Sheet Flow, Sheet flow -grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 1.3 | 179 | 0.0129 | 2.31 | | Shallow Concentrated Flow, SCF - paved |
| | | | | | | Paved Kv= 20.3 fps |
| | 1.5 | 67 | 0.0120 | 0.77 | | Shallow Concentrated Flow, SCF _ grass |
| | | | | | | Short Grass Pasture Kv= 7.0 fps |
| | 11.5 | 310 | Total | | | |

Subcatchment 5S: DA 5: CN w/ IC areas_Original



Summary for Subcatchment 5Sa: RG 3 DA

Runoff = 3.29 cfs @ 12.19 hrs, Volume= 12,481 cf, Depth= 7.53" Routed to Reach 2R : Bioswale E 1 RG 3

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| | A | vrea (sf) | CN | Description | | |
|---|-------|-----------|--------------|-------------|-------------|--|
| * | | 10,182 | 79 | Open Spac | e (Fair) C | |
| * | | 9,716 | 98 | Impervious | Parking lot | |
| | | 19,898 | 88 | Weighted A | verage | |
| | | 10,182 | 79 | 51.17% Pe | rvious Area | |
| | | 9,716 | 98 | 48.83% Imp | pervious Ar | ea |
| | | | | | | |
| | Tc | Length | Slope | e Velocity | Capacity | Description |
| _ | (min) | (feet) | (ft/ft) |) (ft/sec) | (cfs) | |
| | 8.7 | 64 | 0.0105 | 5 0.12 | | Sheet Flow, Sheet flow -grass |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 1.3 | 179 | 0.0129 | 2.31 | | Shallow Concentrated Flow, SCF - paved |
| | | | | | | Paved Kv= 20.3 fps |
| | 1.5 | 67 | 0.0120 | 0.77 | | Shallow Concentrated Flow, SCF _ grass |
| | | | | | | Short Grass Pasture Kv= 7.0 fps |
| | | 0.4.0 | — · · | | | |

11.5 310 Total

Subcatchment 5Sa: RG 3 DA



Summary for Subcatchment 5Sb: DA 5: CN w/ IC areas

Runoff = 10.03 cfs @ 12.19 hrs, Volume= 39,643 cf, Depth= 8.18" Routed to Pond 10P : Underground Storage w/ Porous Pavement 5

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| _ | A | rea (sf) | CN I | Description | | | | |
|---|---------------------------------|----------|---------|---------------------|------------|--|--|--|
| * | | 1,112 | 79 (| Open Spac | e (Fair) C | | | |
| * | | 9,899 | 74 (| Open Space (good) C | | | | |
| * | | 47,152 | 98 I | 98 Impervious | | | | |
| | 58,163 94 Weighted Average | | | | verage | | | |
| | 11,011 75 18.93% Pervious Area | | | | | | | |
| | 47,152 98 81.07% Impervious Are | | | | | ea | | |
| | | | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description | | |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | | | |
| | 8.7 | 64 | 0.0105 | 0.12 | | Sheet Flow, Sheet flow -grass | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | |
| | 1.3 | 179 | 0.0129 | 2.31 | | Shallow Concentrated Flow, SCF - paved | | |
| | | | | | | Paved Kv= 20.3 fps | | |
| | 1.5 | 67 | 0.0120 | 0.77 | | Shallow Concentrated Flow, SCF _ grass | | |
| _ | | | | | | Short Grass Pasture Kv= 7.0 fps | | |

11.5 310 Total

Subcatchment 5Sb: DA 5: CN w/ IC areas



Summary for Subcatchment 6S: DA 6: CN w/ IC areas

Runoff = 4.92 cfs @ 12.22 hrs, Volume= 19,868 cf, Depth= 7.44" Routed to Pond 11P : Proposed Rain Garden 2 (East)

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| _ | A | rea (sf) | CN | Description | | | | |
|---|-------|--------------------------------|---------|------------------------|--------------|--|--|--|
| * | | 16,559 | 79 | 79 Open Space (fair) C | | | | |
| * | | 998 | 74 (| Open Spac | e (good) C | | | |
| * | | 14,476 | 98 | mpervious | | | | |
| | | 32,033 | 87 | Weighted A | verage | | | |
| | | 17,557 79 54.81% Pervious Area | | | | | | |
| | | 14,476 | 98 4 | 45.19% Imp | pervious Are | ea | | |
| | | | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description | | |
| _ | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | | | |
| | 12.8 | 100 | 0.0098 | 0.13 | | Sheet Flow, Sheet flow - grass | | |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" | | |
| | 0.5 | 86 | 0.0244 | 3.17 | | Shallow Concentrated Flow, SCF - paved | | |
| | | | | | | Paved Kv= 20.3 fps | | |
| | 0.7 | 90 | 0.0178 | 2.15 | | Shallow Concentrated Flow, SCF - unpaved | | |
| | | | | | | Unpaved Kv= 16.1 fps | | |
| | | | | | | | | |

14.0 276 Total

Subcatchment 6S: DA 6: CN w/ IC areas



Summary for Subcatchment 7S: DA 7 (Offsite South): CN w/ IC areas

Runoff = 15.19 cfs @ 12.22 hrs, Volume= Routed to Link 1L : Offsite Flows

60,044 cf, Depth= 6.73"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| | A | rea (sf) | CN [| Description | | |
|--------------------------|-------|----------|------------|-------------|-------------|--|
| * | | 70,444 | 79 (| Open Spac | e (fair) C | |
| * | | 16,401 | 74 (| Dpen Spac | e (good) C | |
| * | | 20,156 | 98 I | mpervious | | |
| | 1 | 07,001 | 82 \ | Neighted A | verage | |
| 86,845 78 81.16% Perviou | | | 31.16% Pei | vious Area | | |
| | | 20,156 | 98 1 | 18.84% Imp | pervious Ar | ea |
| | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | |
| | 12.1 | 100 | 0.0112 | 0.14 | | Sheet Flow, Sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 2.2 | 165 | 0.0305 | 1.22 | | Shallow Concentrated Flow, SCF _ grass |
| | | | | | | Short Grass Pasture Kv= 7.0 fps |
| | 0.2 | 44 | 0.0317 | 3.61 | | Shallow Concentrated Flow, SCF _ paved |
| | | | | | | Paved Kv= 20.3 fps |
| | | ~ ~ ~ ~ | | | | |

14.5 309 Total

Subcatchment 7S: DA 7 (Offsite South): CN w/ IC areas



Summary for Subcatchment 8S: DA 8 (Offsite North): CN w/ IC areas

Runoff = 38.58 cfs @ 12.29 hrs, Volume= 165,783 cf, Depth= 5.84" Routed to Link 1L : Offsite Flows

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| | A | rea (sf) | CN | Description | l | |
|---|-------|----------|-------|--------------|--------------|---|
| * | | 2,767 | 70 | Brush (fair) | С | |
| * | | 63,031 | 77 | Brush (fair) | D | |
| * | | 86,643 | 65 | Brush (goo | d) C | |
| * | | 64,708 | 73 | Brush (goo | d) D | |
| * | | 73,083 | 79 | Open spac | e (Fair) C | |
| * | | 30,261 | 84 | Open spac | e (fair) D | |
| * | | 4,460 | 74 | Open spac | e (good) C | |
| * | | 9,087 | 80 | Open space | e (good) D | |
| * | | 6,602 | 98 | Impervious | | |
| | 3 | 840,642 | 75 | Weighted A | Average | |
| | 3 | 34,040 | 74 | 98.06% Pe | rvious Area | |
| | | 6,602 | 98 | 1.94% Imp | ervious Area | а |
| | | | | | | |
| | Тс | Length | Slop | e Velocity | Capacity | Description |
| | (min) | (feet) | (ft/f | t) (ft/sec) | (cfs) | |
| | 7.5 | 100 | 0.036 | 6 0.22 | | Sheet Flow, sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 11.9 | 876 | 0.006 | 7 1.23 | | Shallow Concentrated Flow, scf - grass waterway |
| | | | | | | Grassed Waterway Kv= 15.0 fps |
| | 19.4 | 976 | Total | | | |



Subcatchment 8S: DA 8 (Offsite North): CN w/ IC areas

Summary for Subcatchment 9S: DA 9 (Offsite Field West): CN w/ IC areas

Runoff = 42.84 cfs @ 12.42 hrs, Volume= 227,369 cf, Depth= 5.69" Routed to Link 1L : Offsite Flows

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| | A | rea (sf) | CN I | Description | | |
|---|-------|----------|---------|-------------|--------------|---|
| * | | 72,478 | 65 I | Brush (good | d) C | |
| * | | 10,448 | 79 (| Open spcae | e (fair) C | |
| * | 3 | 92,515 | 74 (| Open Spac | e (good) C | |
| * | | 4,279 | 98 I | mpervious | | |
| | 4 | 79,720 | 73 | Neighted A | verage | |
| | 4 | 75,441 | 73 9 | 99.11% Per | vious Area | |
| | | 4,279 | 98 (|).89% Impe | ervious Area | a |
| | | | | | | |
| | Тс | Length | Slope | Velocity | Capacity | Description |
| | (min) | (feet) | (ft/ft) | (ft/sec) | (cfs) | |
| | 10.5 | 100 | 0.0159 | 0.16 | | Sheet Flow, Sheet flow |
| | | | | | | Grass: Short n= 0.150 P2= 3.34" |
| | 7.1 | 362 | 0.0148 | 0.85 | | Shallow Concentrated Flow, SCF - grass |
| | | | | | | Short Grass Pasture Kv= 7.0 fps |
| | 12.8 | 1,006 | 0.0076 | 1.31 | | Shallow Concentrated Flow, SCF - grass waterway |
| _ | | | | | | Grassed Waterway Kv= 15.0 fps |
| | | | | | | |

30.4 1,468 Total

Subcatchment 9S: DA 9 (Offsite Field West): CN w/ IC areas



Summary for Subcatchment 31S: RG 2 DA

Runoff = 4.81 cfs @ 12.22 hrs, Volume= 19,083 cf, Depth= 7.15"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.05 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

| | A | rea (sf) | CN | Description | | | | |
|----|------------|------------------|-----------------|--------------------------|-------------------|---|--|--|
| * | | 21,638 | 79 | Open Spac | e (fair) C | | | |
| * | | 10,397 | 98 | Impervious | · · · | | | |
| | | 32,035 | 85 | Weighted A | eighted Average | | | |
| | | 21,638 | 79 | 67.54% Pervious Area | | | | |
| | | 10,397 | 98 | 32.46% Imp | pervious Are | ea | | |
| (m | Tc iin) | Length (feet) | Slope (ft/ft | e Velocity) (ft/sec) | Capacity (cfs) | Description | | |
| 12 | 2.8 | 100 | 0.0098 | 3 0.13 | () | Sheet Flow, Sheet flow - grass Grass: Short n= 0.150 P2= 3.34" | | |
| (| 0.5 | 86 | 0.0244 | 4 3.17 | | Shallow Concentrated Flow, SCF - paved Paved Kv= 20.3 fps | | |
| (| 0.7 | 90 | 0.0178 | 3 2.15 | | Shallow Concentrated Flow, SCF - unpaved Unpaved Kv= 16.1 fps | | |
| 14 | 4.0 | 276 | Total | | | | | |

Subcatchment 31S: RG 2 DA



Summary for Reach 1R: Existing Bioswale West 1

Inflow Area = 22,637 sf, 64.43% Impervious, Inflow Depth = 7.80" for 100-Year Current event Inflow 3.52 cfs @ 12.22 hrs, Volume= 14.714 cf = 3.50 cfs @ 12.22 hrs, Volume= Outflow = 14,714 cf, Atten= 1%, Lag= 0.4 min Routed to Pond 1P : Exising Rain Garden 1 West Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Max. Velocity= 2.61 fps, Min. Travel Time= 0.2 min Avg. Velocity = 0.74 fps, Avg. Travel Time= 0.7 min Peak Storage= 44 cf @ 12.22 hrs Average Depth at Peak Storage= 0.34', Surface Width= 5.01' Bank-Full Depth= 0.50' Flow Area= 2.3 sf, Capacity= 7.36 cfs 3.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds Side Slope Z-value= 3.0 '/' Top Width= 6.00' Length= 33.0' Slope= 0.0227 '/' Inlet Invert= 100.75', Outlet Invert= 100.00' ‡ **Reach 1R: Existing Bioswale West 1** Hydrograph Inflow 3.52 cfs Outflow 3.50 cfs Inflow Area=22,637 sf Avg. Flow Depth=0.34' 3 Max Vel=2.61 fps n=0.035 Flow (cfs) L=33.0' 2 S=0.0227 '/' Capacity=7.36 cfs 0 2 46 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72

Time (hours)

Summary for Reach 2R: Bioswale E 1 RG 3

Inflow Area =19,898 sf, 48.83% Impervious, Inflow Depth =7.53" for 100-Year _Current eventInflow =3.29 cfs @12.19 hrs, Volume=12,481 cfOutflow =3.27 cfs @12.19 hrs, Volume=12,481 cf, Atten= 0%, Lag= 0.3 minRouted to Pond 9P : Proposed Rain Garden 3 (North East)

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Max. Velocity= 3.05 fps, Min. Travel Time= 0.2 min Avg. Velocity = 1.01 fps, Avg. Travel Time= 0.6 min

Peak Storage= 38 cf @ 12.19 hrs Average Depth at Peak Storage= 0.46', Surface Width= 3.73' Bank-Full Depth= 0.50' Flow Area= 1.3 sf, Capacity= 4.02 cfs

1.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds Side Slope Z-value= 3.0 '/' Top Width= 4.00' Length= 35.0' Slope= 0.0286 '/' Inlet Invert= 101.00', Outlet Invert= 100.00'



Reach 2R: Bioswale E 1 RG 3



Summary for Pond 1P: Exising Rain Garden 1 West

[93] Warning: Storage range exceeded by 0.41' [88] Warning: Qout>Qin may require smaller dt or Finer Routing [85] Warning: Oscillations may require smaller dt or Finer Routing (severity=3) [62] Hint: Exceeded Reach 1R OUTLET depth by 0.32' @ 12.25 hrs 22,637 sf, 64.43% Impervious, Inflow Depth = 7.80" for 100-Year Current event Inflow Area = Inflow = 3.50 cfs @ 12.22 hrs, Volume= 14,714 cf 3.59 cfs @ 12.24 hrs, Volume= 14,532 cf, Atten= 0%, Lag= 0.9 min Outflow = 0.35 cfs @ 12.24 hrs, Volume= Primary 7,571 cf = Routed to Pond 2P : Underground Storage w/ Porous Pavement 1 Secondary = 3.24 cfs @ 12.24 hrs, Volume= 6,962 cf Routed to Pond 2P : Underground Storage w/ Porous Pavement 1 Routing by Stor-Ind method. Time Span= 0.00-72.00 hrs. dt= 0.05 hrs Peak Elev= 100.66' @ 12.24 hrs Surf.Area= 1,750 sf Storage= 1,831 cf

Plug-Flow detention time= 223.5 min calculated for 14,532 cf (99% of inflow) Center-of-Mass det. time= 215.3 min (983.2 - 767.8)

| Volume | Invert | Avai | il.Stor | age | Storage Descript | ion | | |
|----------|-----------|----------|---------|---|---|---|---|--|
| #1 | 98.25' | 1,831 cf | | 81 cf | Custom Stage | Data (Conic)Listed | below (Recalc) | |
| Elevatio | on Su | rf.Area | Voic | ls | Inc.Store | Cum.Store | Wet.Area | |
| (fee | et) | (sq-ft) | (% | o) | (cubic-feet) | (cubic-feet) | (sq-ft) | |
| 98.2 | 25 | 1,445 | 0. | .0 | 0 | 0 | 1,445 | |
| 99.2 | 25 | 1,445 | 35. | .0 | 506 | 506 | 1,580 | |
| 99.5 | 50 | 1,445 | 25. | .0 | 90 | 596 | 1,613 | |
| 100.0 | 00 | 1,750 | 100. | .0 | 798 | 1,394 | 1,927 | |
| 100.2 | 25 | 1,750 | 100. | 0 | 438 | 1,831 | 1,964 | |
| Device | Routing | In | vert | Outl | et Devices | | | |
| #1 | Primary | 98 | .15' | 4.0" Inlet | Round Culvert / Outlet Invert= 98 | L= 11.0' Ke= 0.50 3.15' / 98.09' S= 0 PE_corrugated inte | 00).0055 '/' Cc= 0.900 erior Elow Area= 0.09 sf | |
| #2 | Device 1 | 98 | .15' | 0.5" Vert. Restrictive Orifice C= 0.600 Limited to weir flow at low heads | | | | |
| #3 | Device 2 | 98 | .25' | 4.0'' Inlet | Round 4" HDPE | Underdrain $L= 2$ 3.25' / 98.15' S= 0 | 0.0' Ke= 0.500).0050 '/' Cc= 0.900 prior Elow Area= 0.09 sf | |
| #4 | Device 3 | 98 | .25' | 0.9" X 3 | x 0.1" Horiz. Per rows C= 0.600 Li | forations X 400.00 mited to weir flow a |) columns at low heads | |
| #5 | Device 1 | 100 | .00' | 4.0" | Horiz. Draintech | Atrium C= 0.600 |) | |
| #6 | Secondary | 100 | .10' | Limi 3.0' Hea 2.50 Coe 2.85 | ted to weir flow at long x 2.0' bread d (feet) 0.20 0.40 0 3.00 3.50 f. (English) 2.54 2 0 3.07 3.20 3.32 | low heads I th Broad-Crested 0.60 0.80 1.00 2.61 2.61 2.60 2. | Rectangular Weir 1.20 1.40 1.60 1.80 2.00 66 2.70 2.77 2.89 2.88 | |

| Site1HillsboroughMunicpComplex_202406NOAA 24-hr C 100-Year | _Current Rainfall=8.95" |
|---|-------------------------|
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Primary OutFlow Max=0.35 cfs @ 12.24 hrs HW=100.65' (Free Discharge) 1=Culvert (Passes 0.35 cfs of 0.47 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.58 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.37 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.59 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.34 cfs @ 3.87 fps)

Secondary OutFlow Max=3.16 cfs @ 12.24 hrs HW=100.65' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 3.16 cfs @ 1.93 fps)



Pond 1P: Exising Rain Garden 1 West

Summary for Pond 2P: Underground Storage w/ Porous Pavement 1

[44] Hint: Outlet device #3 is below defined storage[79] Warning: Submerged Pond 1P Primary device # 1 INLET by 0.34'

| Inflow Area | = | 61,742 sf, | 66.85% Impervious, | Inflow Depth > 7. | 78" for 100-Year _Current event |
|-------------|---|------------|--------------------|-------------------|---------------------------------|
| Inflow | = | 9.60 cfs @ | 12.23 hrs, Volume= | 40,014 cf | |
| Outflow | = | 2.71 cfs @ | 12.63 hrs, Volume= | 22,531 cf, | Atten= 72%, Lag= 24.0 min |
| Primary | = | 0.02 cfs @ | 12.63 hrs, Volume= | 3,923 cf | - |
| Secondary | = | 2.69 cfs @ | 12.63 hrs, Volume= | 18,608 cf | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 98.49' @ 12.63 hrs Surf.Area= 13,421 sf Storage= 21,820 cf

Plug-Flow detention time= 491.9 min calculated for 22,515 cf (56% of inflow) Center-of-Mass det. time= 318.6 min (1,163.1 - 844.5)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 1,612 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 9,359 cf | 72.75'W x 146.02'L x 3.50'H Field A |
| | | | 37,179 cf Overall - 13,782 cf Embedded = 23,397 cf x 40.0% Voids |
| #3A | 96.17' | 13,782 cf | ADS_StormTech SC-740 +Cap x 300 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 300 Chambers in 15 Rows |
| | | 24 752 of | Total Available Storage |

24,753 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio | on | Surf.Area | Void | s Inc.Store | Cum.Store | | | |
|----------|----------|-----------|-------|---|-------------------|--------------------------------|--|--|
| (fee | et) | (sq-ft) | (% |) (cubic-feet) | (cubic-feet) | <u> </u> | | |
| 96.1 | 17 | 2,798 | 0. | 0 0 | 0 | | | |
| 97.6 | 67 | 2,798 | 35. | 0 1,469 | 1,469 | 1 | | |
| 97.8 | 33 | 2,798 | 15. | 0 67 | 1,536 | i | | |
| 98.0 | 01 | 2,798 | 15. | 0 76 | 1,612 | | | |
| Device | Routing | In | vert | Outlet Devices | | | | |
| #1 | Primary | 92 | 2.07' | 0.5" Vert. Restriction | on Orifice C= 0 | 0.600 | | |
| | - | | | Limited to weir flow | at low heads | | | |
| #2 | Device 1 | 92 | 2.17' | 6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 | | | | |
| | | | | Inlet / Outlet Invert= | 92.17' / 90.37' | S= 0.0050 '/' Cc= 0.900 | | |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | d interior, Flow Area= 0.20 sf | | |
| #3 | Device 2 | 92 | 2.17' | 0.9" x 0.1" Horiz. P | erforations X 40 | 00.00 columns | | |
| | | | | X 3 rows C= 0.600 | Limited to weir f | low at low heads | | |
| #4 | Seconda | ry 98 | 8.00' | 3.0' long x 2.0' bre | adth Broad-Cre | sted Rectangular Weir | | |
| | | | | Head (feet) 0.20 0. | .40 0.60 0.80 1 | .00 1.20 1.40 1.60 1.80 2.00 | | |
| | | | | 2.50 3.00 3.50 | | | | |
| | | | | Coef. (English) 2.54 | 4 2.61 2.61 2.6 | 0 2.66 2.70 2.77 2.89 2.88 | | |
| | | | | 2.85 3.07 3.20 3.3 | 32 | | | |

Primary OutFlow Max=0.02 cfs @ 12.63 hrs HW=98.49' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 12.18 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.48 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 9.08 cfs potential flow)

Secondary OutFlow Max=2.68 cfs @ 12.63 hrs HW=98.49' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 2.68 cfs @ 1.83 fps)

Pond 2P: Underground Storage w/ Porous Pavement 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

20 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 144.02' Row Length +12.0" End Stone x 2 = 146.02' Base Length 15 Rows x 51.0" Wide + 6.0" Spacing x 14 + 12.0" Side Stone x 2 = 72.75' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

300 Chambers x 45.9 cf = 13,782.0 cf Chamber Storage

37,179.5 cf Field - 13,782.0 cf Chambers = 23,397.5 cf Stone x 40.0% Voids = 9,359.0 cf Stone Storage

Chamber Storage + Stone Storage = 23,141.0 cf = 0.531 af Overall Storage Efficiency = 62.2% Overall System Size = 146.02' x 72.75' x 3.50'

300 Chambers 1,377.0 cy Field 866.6 cy Stone





Pond 2P: Underground Storage w/ Porous Pavement 1

Summary for Pond 3P: Underground Storage w/ Porous Pavement 2

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area | = | 58,249 sf | , 86.46% Impervious, | Inflow Depth = 8.35" | for 100-Year _Current event |
|-------------|---|-------------|----------------------|----------------------|-----------------------------|
| Inflow | = | 11.82 cfs @ | 12.14 hrs, Volume= | 40,516 cf | |
| Outflow | = | 2.26 cfs @ | 12.56 hrs, Volume= | 20,217 cf, Atte | n= 81%, Lag= 25.4 min |
| Primary | = | 0.02 cfs @ | 12.56 hrs, Volume= | 3,938 cf | |
| Secondary | = | 2.25 cfs @ | 12.56 hrs, Volume= | 16,279 cf | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 98.43' @ 12.56 hrs Surf.Area= 23,296 sf Storage= 25,186 cf

Plug-Flow detention time= 569.6 min calculated for 20,203 cf (50% of inflow) Center-of-Mass det. time= 436.0 min (1,184.2 - 748.2)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 8,187 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 8,029 cf | 82.25'W x 110.42'L x 3.50'H Field A |
| | | | 31,786 cf Overall - 11,715 cf Embedded = 20,071 cf x 40.0% Voids |
| #3A | 96.17' | 11,715 cf | ADS_StormTech SC-740 +Cap x 255 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 255 Chambers in 17 Rows |
| | | 27 031 of | Total Available Storage |

27,931 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio | on et) | Surf.Area (sq-ft) | Void %) | s Inc.Store b) (cubic-feet) | Cum.Store (cubic-feet) | |
|----------|-----------|----------------------|------------|--------------------------------|---------------------------|------------------------------|
| 96.1 | 17 | 14,214 | 0. | 0 0 | 0 | |
| 97.6 | 67 | 14,214 | 35. | 0 7,462 | 7,462 | |
| 97.8 | 33 | 14,214 | 15. | 0 341 | 7,803 | |
| 98.0 |)1 | 14,214 | 15. | 0 384 | 8,187 | |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | on Orifice C= 0. | 600 |
| | | | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | PE Underdrain L | = 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | = 92.17' / 90.37' | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. F | Perforations X 40 | 0.00 columns |
| | - · | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bre | eadth Broad-Cres | sted Rectangular Weir |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | 4 0 04 0 04 0 00 | |
| | | | | | 4 2.01 2.01 2.00 | 2.66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3. | 32 | |

Primary OutFlow Max=0.02 cfs @ 12.56 hrs HW=98.43' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 12.13 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.48 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 9.04 cfs potential flow)

Secondary OutFlow Max=2.24 cfs @ 12.56 hrs HW=98.43' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 2.24 cfs @ 1.72 fps)

Pond 3P: Underground Storage w/ Porous Pavement 2 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

15 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 108.42' Row Length +12.0" End Stone x 2 = 110.42' Base Length 17 Rows x 51.0" Wide + 6.0" Spacing x 16 + 12.0" Side Stone x 2 = 82.25' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

255 Chambers x 45.9 cf = 11,714.7 cf Chamber Storage

31,786.2 cf Field - 11,714.7 cf Chambers = 20,071.5 cf Stone x 40.0% Voids = 8,028.6 cf Stone Storage

Chamber Storage + Stone Storage = 19,743.3 cf = 0.453 af Overall Storage Efficiency = 62.1% Overall System Size = 110.42' x 82.25' x 3.50'

255 Chambers 1,177.3 cy Field 743.4 cy Stone





Pond 3P: Underground Storage w/ Porous Pavement 2

Summary for Pond 4P: Existing Rain Garden 2 Front

[93] Warning: Storage range exceeded by 0.51'

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=4)

| Inflow Area | = | 25,889 | sf, 48.62% Ir | npervious, | Inflow Depth = 7 | 7.52" | for 10 | 0-Year | _Current ev | /ent |
|-------------|---------|------------|---------------|------------|------------------|-------|--------|----------|-------------|------|
| Inflow | = | 4.77 cfs @ | 2 12.15 hrs, | Volume= | 16,228 cf | | | | | |
| Outflow | = | 4.57 cfs @ |) 12.15 hrs, | Volume= | 15,079 cf, | Atten | = 4%, | Lag= 0.1 | 1 min | |
| Primary | = | 0.38 cfs @ | 0 12.15 hrs, | Volume= | 7,457 cf | | | | | |
| Routed | to Pond | 6P : Unde | rground Stora | ge w/ Porc | ous Pavement 3 | | | | | |
| Secondary | = | 4.19 cfs @ |) 12.15 hrs, | Volume= | 7,622 cf | | | | | |
| Routed | to Pond | 6P : Unde | rground Stora | ge w/ Porc | ous Pavement 3 | | | | | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 101.76' @ 12.15 hrs Surf.Area= 3,045 sf Storage= 3,267 cf

Plug-Flow detention time= 296.1 min calculated for 15,079 cf (93% of inflow) Center-of-Mass det. time= 256.2 min (1,026.5 - 770.2)

| Volume | Invert | Avail | .Stora | age Storage Descri | ption | |
|----------|-----------|---------|--------|---|---|---|
| #1 | 99.25' | | 3,267 | r cf Custom Stage | Data (Conic) Listed | l below (Recalc) |
| Elevatio | on Su | rf.Area | Voids | s Inc.Store | Cum.Store | Wet.Area |
| (fee | et) | (sq-ft) | (%) |) (cubic-feet) | (cubic-feet) | <u>(sq-ft)</u> |
| 99.2 | 25 | 2,635 | 0.0 |) 0 | 0 | 2,635 |
| 100.2 | 25 | 2,635 | 35.0 |) 922 | 922 | 2,817 |
| 100.5 | 50 | 2,635 | 25.0 |) 165 | 1,087 | 2,862 |
| 101.0 | 00 | 3,045 | 100.0 |) 1,419 | 2,506 | 3,283 |
| 101.2 | 25 | 3,045 | 100.0 |) 761 | 3,267 | 3,332 |
| Device | Routing | ١n | /ert | Outlet Devices | | |
| #1 | Primary | 99. | 15' | 4.0" Round Culver Inlet / Outlet Invert= n= 0.020 Corrugate | t L= 11.0' Ke= 0.5 99.15' / 99.09' S= 0 d PE, corrugated int | 00 0.0055 '/' Cc= 0.900 erior, Flow Area= 0.09 sf |
| #2 | Device 1 | 99. | 15' | 0.5" Vert. Restrictiv | e Orifice C= 0.600 at low heads |) |
| #3 | Device 2 | 99. | 25' 4 | 4.0" Round 4" HDF Inlet / Outlet Invert= n= 0.020 Corrugated | PE Underdrain L= 2 99.25' / 99.15' S= 0 d PE, corrugated int | 20.0' Ke= 0.500 0.0050 '/' Cc= 0.900 erior. Flow Area= 0.09 sf |
| #4 | Device 3 | 99. | 25' | 0.9" x 0.1" Horiz. Pe X 3 rows C= 0.600 | erforations X 400.0 Limited to weir flow | 0 columns at low heads |
| #5 | Device 1 | 101. | .00' | 4.0" Horiz. Drainted | Atrium C= 0.600 | 0 |
| #6 | Secondary | 101. | 10' | 3.0' long x 2.0' brea Head (feet) 0.20 0.4 2.50 3.00 3.50 Coef. (English) 2.54 2.85 3.07 3.20 3.32 | adth Broad-Crested 40 0.60 0.80 1.00 2.61 2.61 2.60 2 | d Rectangular Weir 1.20 1.40 1.60 1.80 2.00 .66 2.70 2.77 2.89 2.88 |

| Site1HillsboroughMunicpComplex_202406NOAA 24-hr C 100-Year | _Current Rainfall=8.95" |
|---|-------------------------|
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Primary OutFlow Max=0.38 cfs @ 12.15 hrs HW=101.76' (Free Discharge) 1=Culvert (Passes 0.38 cfs of 0.48 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.75 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.38 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.72 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.37 cfs @ 4.19 fps)

Secondary OutFlow Max=4.18 cfs @ 12.15 hrs HW=101.76' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 4.18 cfs @ 2.12 fps)



Pond 4P: Existing Rain Garden 2 Front

Summary for Pond 5P: Proposed Rain Garden 1 (South West)

[93] Warning: Storage range exceeded by 0.45'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

| Inflow Area | = | 21,3 | 388 sf, | 65.14% In | npervious, | Inflow Depth = | 7.69" | for 10 | 00-Year | Current eve | ent |
|-------------|---------|--------|----------|------------|------------|----------------|----------|--------|---------|-------------|-----|
| Inflow | = | 3.95 c | ofs @ | 12.15 hrs, | Volume= | 13,706 c | F | | | | |
| Outflow | = | 3.96 c | ofs @ | 12.15 hrs, | Volume= | 13,141 c | f, Atten | = 0%, | Lag= 0. | 0 min | |
| Primary | = | 0.36 c | ofs @ | 12.15 hrs, | Volume= | 6,965 c | f | | | | |
| Routed | to Pond | 6P : U | Indergro | ound Stora | ge w/ Poro | us Pavement 3 | | | | | |
| Secondary | = | 3.60 c | ofs @ | 12.15 hrs, | Volume= | 6,176 c | F | | | | |
| Routed | to Pond | 6P : U | Indergr | ound Stora | ge w/ Poro | us Pavement 3 | | | | | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 101.70' @ 12.15 hrs Surf.Area= 2,325 sf Storage= 2,466 cf

Plug-Flow detention time= 296.2 min calculated for 13,141 cf (96% of inflow) Center-of-Mass det. time= 270.9 min (1,032.9 - 762.0)

| Volume | Invert | Avail | I.Stor | age | Storage Descript | ion | |
|----------|-----------|---------|--------|---|---|---|--|
| #1 | 99.25' | | 2,46 | 6 cf | Custom Stage | Data (Conic)Listed | below (Recalc) |
| Elevatio | on Su | rf.Area | Void | s | Inc.Store | Cum.Store | Wet.Area |
| (fee | et) | (sq-ft) | (% |) | (cubic-feet) | (cubic-feet) | <u>(sq-ft)</u> |
| 99.2 | 25 | 1,970 | 0. | 0 | 0 | 0 | 1,970 |
| 100.2 | 25 | 1,970 | 35. | 0 | 690 | 690 | 2,127 |
| 100.5 | 50 | 1,970 | 25. | 0 | 123 | 813 | 2,167 |
| 101.0 | 00 | 2,325 | 100. | 0 | 1,073 | 1,885 | 2,531 |
| 101.2 | 25 | 2,325 | 100. | 0 | 581 | 2,466 | 2,574 |
| Device | Routing | ١n | vert | Outle | et Devices | | |
| #1 | Primary | 99. | .15' | 4.0 " Inlet | Round Culvert / Outlet Invert= 99 | L= 11.0' Ke= 0.5 9.15' / 99.09' S= 0 PE. corrugated int | 00 0.0055 '/' Cc= 0.900 erior. Flow Area= 0.09 sf |
| #2 | Device 1 | 99. | .15' | 0.5'' Limit | Vert. Restrictive | Orifice C= 0.600 |) |
| #3 | Device 2 | 99. | .25' | 4.0 " Inlet | Round 4" HDPE / Outlet Invert= 99 | Underdrain L= 2 9.25' / 99.15' S= 0 PE. corrugated int | 20.0' Ke= 0.500 0.0050 '/' Cc= 0.900 erior. Flow Area= 0.09 sf |
| #4 | Device 3 | 99. | .25' | 0.9 " X 3 I | x 0.1" Horiz. Per rows C= 0.600 Li | forations X 400.0 mited to weir flow | o columns at low heads |
| #5 | Device 1 | 101. | .00' | 4.0'' | Horiz. Draintech | Atrium C= 0.600 |) |
| #6 | Secondary | 101. | .10' | 3.0' Head 2.50 Coet 2.85 | long x 2.0' bread d (feet) 0.20 0.40 3.00 3.50 f. (English) 2.54 2 3.07 3.20 3.32 | Ith Broad-Crested 0 0.60 0.80 1.00 2.61 2.61 2.60 2 | Rectangular Weir 1.20 1.40 1.60 1.80 2.00 .66 2.70 2.77 2.89 2.88 |

| Site1HillsboroughMunicpComplex_202406NOAA 24-hr C 100-Year | _Current Rainfall=8.95" |
|---|-------------------------|
| Prepared by Rutgers Cooperative Extension Water Resources Program | Printed 6/29/2024 |
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Primary OutFlow Max=0.36 cfs @ 12.15 hrs HW=101.69' (Free Discharge) 1=Culvert (Passes 0.36 cfs of 0.47 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.65 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.37 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.65 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.35 cfs @ 4.01 fps)

Secondary OutFlow Max=3.59 cfs @ 12.15 hrs HW=101.69' (Free Discharge) G=Broad-Crested Rectangular Weir (Weir Controls 3.59 cfs @ 2.01 fps)



Pond 5P: Proposed Rain Garden 1 (South West)

Summary for Pond 6P: Underground Storage w/ Porous Pavement 3

[44] Hint: Outlet device #3 is below defined storage

| Inflow Area | = | 158,623 sf | ,63.48% In | npervious, | Inflow Depth > | 7.59" | for 100 | -Year | Current event |
|-------------|---|-------------|------------|------------|----------------|----------|---------|--------|---------------|
| Inflow | = | 29.28 cfs @ | 12.15 hrs, | Volume= | 100,354 ct | f | | | |
| Outflow | = | 2.88 cfs @ | 13.11 hrs, | Volume= | 46,089 ct | f, Atten | = 90%, | Lag= 5 | 57.8 min |
| Primary | = | 0.02 cfs @ | 13.11 hrs, | Volume= | 3,954 ct | f | | - | |
| Secondary | = | 2.86 cfs @ | 13.11 hrs, | Volume= | 42,135 cl | f | | | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 98.51' @ 13.11 hrs Surf.Area= 38,014 sf Storage= 63,177 cf

Plug-Flow detention time= 475.9 min calculated for 46,057 cf (46% of inflow) Center-of-Mass det. time= 287.4 min (1,123.8 - 836.4)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|---|
| #1 | 96.17' | 4,287 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 26,630 cf | 106.00'W x 288.42'L x 3.50'H Field A |
| | | | 107,003 cf Overall - 40,427 cf Embedded = 66,575 cf x 40.0% Voids |
| #3A | 96.17' | 40,427 cf | ADS_StormTech SC-740 +Cap x 880 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 880 Chambers in 22 Rows |
| | | 71 244 of | Total Available Storage |

71,344 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Voic (% | ds Inc.Store %) (cubic-feet) | Cum.Store (cubic-feet) | |
|------------------|-----------|----------------------|------------|---------------------------------|---------------------------|------------------------------|
| 96.1 | 17 | 7,442 | 0. | 0.0 0.0 | 0 | |
| 97.6 | 67 | 7,442 | 35. | 5.0 3,907 | 3,907 | |
| 97.8 | 33 | 7,442 | 15. | 5.0 179 | 4,086 | |
| 98.0 |)1 | 7,442 | 15. | 5.0 201 | 4,287 | |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | on Orifice C= 0. | 600 |
| | | | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | PE Underdrain L | = 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | = 92.17' / 90.37' S | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. F | Perforations X 40 | 0.00 columns |
| | | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bre | eadth Broad-Cres | ted Rectangular Weir |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | | |
| | | | | Coet. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3.3 | 32 | |

Primary OutFlow Max=0.02 cfs @ 13.11 hrs HW=98.51' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 12.20 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.48 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 9.09 cfs potential flow)

Secondary OutFlow Max=2.86 cfs @ 13.11 hrs HW=98.51' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 2.86 cfs @ 1.87 fps)
Pond 6P: Underground Storage w/ Porous Pavement 3 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

40 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 286.42' Row Length +12.0" End Stone x 2 = 288.42' Base Length 22 Rows x 51.0" Wide + 6.0" Spacing x 21 + 12.0" Side Stone x 2 = 106.00' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

880 Chambers x 45.9 cf = 40,427.2 cf Chamber Storage

107,002.6 cf Field - 40,427.2 cf Chambers = 66,575.4 cf Stone x 40.0% Voids = 26,630.1 cf Stone Storage

Chamber Storage + Stone Storage = 67,057.4 cf = 1.539 af Overall Storage Efficiency = 62.7% Overall System Size = 288.42' x 106.00' x 3.50'

880 Chambers 3,963.1 cy Field 2,465.8 cy Stone





Pond 6P: Underground Storage w/ Porous Pavement 3

Summary for Pond 7P: Proposed Rain Garden 4 (North)

[93] Warning: Storage range exceeded by 0.49'

Inflow Area = 24,369 sf, 57.53% Impervious, Inflow Depth = 7.73" for 100-Year Current event 4.54 cfs @ 12.15 hrs, Volume= Inflow = 15.693 cf Outflow = 4.42 cfs @ 12.15 hrs, Volume= 14,753 cf, Atten= 3%, Lag= 0.0 min 0.37 cfs @ 12.15 hrs, Volume= Primary = 7,590 cf Routed to Pond 8P : Underground Storage w/ Porous Pavement 4 4.05 cfs @ 12.15 hrs, Volume= Secondary = 7.163 cf Routed to Pond 8P : Underground Storage w/ Porous Pavement 4

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2 Peak Elev= 100.74' @ 12.15 hrs Surf.Area= 2,435 sf Storage= 2,453 cf

Plug-Flow detention time= 280.2 min calculated for 14,753 cf (94% of inflow) Center-of-Mass det. time= 245.4 min (1,010.3 - 764.9)

| Volume | Invert | Avail | .Stora | age Storage Des | scription | | | |
|------------------|--------------|--------------------|-------------|--|---|--|--|--|
| #1 | 98.25' | | 2,45 | 3 cf Custom Sta | age Data (Conic)Lis | sted below (Recalc) | | |
| Elevatio (fee | on Su et) | rf.Area (sɑ-ft) | Voids %) | s Inc.Stor | e Cum.Store | Wet.Area (sq-ft) | | |
| 98.2 | 25 | 1.870 | 0.0 |) (| 0 0 | 1.870 | | |
| 99.2 | 25 | 1,870 | 35.0 | 0 65 | 5 655 | 2,023 | | |
| 99. | 50 | 1,870 | 25.0 | D 11 ⁻ | 7 771 | 2,062 | | |
| 100.0 | 00 | 2,435 | 100.0 | 0 1,07 | 3 1,845 | 2,633 | | |
| 100.2 | 25 | 2,435 | 100.0 | 0 60 | 9 2,453 | 2,676 | | |
| Device | Routing | Inv | /ert | Outlet Devices | | | | |
| #1 | Primary | 98. | 15' | 4.0" Round Culv Inlet / Outlet Inver n= 0 020 Corrug | /ert L= 11.0' Ke= t= 98.15' / 98.09' sted PE_corrugated | 0.500 S= 0.0055 '/' Cc= 0.900 Linterior Elow Area= 0.09 sf | | |
| #2 | Device 1 | 98.15' | | 0.5" Vert. Restrictive Orifice C= 0.600 Limited to weir flow at low heads | | | | |
| #3 | Device 2 | 98. | 25' | 4.0" Round 4" H Inlet / Outlet Inver | IDPE Underdrain L t= 98.25' / 98.15' | _= 20.0' Ke= 0.500 S= 0.0050 '/' Cc= 0.900 | | |
| #4 | Device 3 | 98. | 25' | n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.09 0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads | | | | |
| #5 | Device 1 | 100. | 00' | 4.0" Horiz. Drain | tech Atrium C= 0 | .600 | | |
| #6 | Secondary | 100. | 10' | Limited to weir flow at low heads 3.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 | | | | |
| | | | | 2.85 3.07 3.20 3 | 3.32 | | | |

| Site1HillsboroughMunicpComplex_202406NOAA 24-hr C 100-Year | _Current Rainfall=8.95" |
|---|-------------------------|
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Primary OutFlow Max=0.37 cfs @ 12.15 hrs HW=100.74' (Free Discharge) 1=Culvert (Passes 0.37 cfs of 0.48 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.72 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.37 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.70 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.36 cfs @ 4.15 fps)

Secondary OutFlow Max=4.02 cfs @ 12.15 hrs HW=100.74' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 4.02 cfs @ 2.09 fps)



Pond 7P: Proposed Rain Garden 4 (North)

Summary for Pond 8P: Underground Storage w/ Porous Pavement 4

[44] Hint: Outlet device #3 is below defined storage[79] Warning: Submerged Pond 7P Primary device # 1 INLET by 0.25'

| Inflow Area | a = | 97,166 sf, | 80.96% Impervious, | Inflow Depth > 8.1 | 1" for 100-Year _Current event |
|-------------|-----|-------------|--------------------|--------------------|--------------------------------|
| Inflow | = | 18.59 cfs @ | 12.15 hrs, Volume= | 65,687 cf | |
| Outflow | = | 2.00 cfs @ | 13.01 hrs, Volume= | 28,773 cf, A | tten= 89%, Lag= 51.4 min |
| Primary | = | 0.02 cfs @ | 13.01 hrs, Volume= | 3,954 cf | |
| Secondary | = | 1.99 cfs @ | 13.01 hrs, Volume= | 24,818 cf | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 98.40' @ 13.01 hrs Surf.Area= 33,612 sf Storage= 42,317 cf

Plug-Flow detention time= 534.8 min calculated for 28,753 cf (44% of inflow) Center-of-Mass det. time= 350.1 min (1,157.2 - 807.2)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 9,112 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 15,592 cf | 63.25'W x 281.30'L x 3.50'H Field A |
| | | | 62,272 cf Overall - 23,292 cf Embedded = 38,980 cf x 40.0% Voids |
| #3A | 96.17' | 23,292 cf | ADS_StormTech SC-740 +Cap x 507 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 507 Chambers in 13 Rows |
| | | 47.006 cf | Total Available Storage |

47,996 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void (% | ls Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | |
|------------------|-----------|----------------------|------------|------------------------------|---------------------------|------------------------------|
| 96.1 | 17 | 15,820 | 0. | 0 0 | 0 | |
| 97.6 | 67 | 15,820 | 35. | .0 8,306 | 8,306 | |
| 97.8 | 33 | 15,820 | 15. | .0 380 | 8,685 | |
| 98.0 |)1 | 15,820 | 15. | .0 427 | 9,112 | |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restrict | ion Orifice C= 0. | 600 |
| | 2 | | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | PE Underdrain L | .= 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | = 92.17' / 90.37' S | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. F | Perforations X 40 | 0.00 columns |
| | | | | X 3 rows C= 0.600 | Limited to weir fle | ow at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bro | eadth Broad-Cres | sted Rectangular Weir |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | | |
| | | | | Coef. (English) 2.5 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3.3 | 32 | |

Primary OutFlow Max=0.02 cfs @ 13.01 hrs HW=98.40' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 12.09 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.48 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 9.01 cfs potential flow)

Secondary OutFlow Max=1.98 cfs @ 13.01 hrs HW=98.40' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 1.98 cfs @ 1.65 fps)

Pond 8P: Underground Storage w/ Porous Pavement 4 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

39 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 279.30' Row Length +12.0" End Stone x 2 = 281.30' Base Length
13 Rows x 51.0" Wide + 6.0" Spacing x 12 + 12.0" Side Stone x 2 = 63.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

507 Chambers x 45.9 cf = 23,291.6 cf Chamber Storage

62,272.0 cf Field - 23,291.6 cf Chambers = 38,980.5 cf Stone x 40.0% Voids = 15,592.2 cf Stone Storage

Chamber Storage + Stone Storage = 38,883.8 cf = 0.893 af Overall Storage Efficiency = 62.4% Overall System Size = 281.30' x 63.25' x 3.50'

507 Chambers 2,306.4 cy Field 1,443.7 cy Stone



Pond 8P: Underground Storage w/ Porous Pavement 4

Summary for Pond 9P: Proposed Rain Garden 3 (North East)

[93] Warning: Storage range exceeded by 0.38'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

[62] Hint: Exceeded Reach 2R OUTLET depth by 0.17' @ 12.20 hrs

Inflow Area = 19,898 sf, 48.83% Impervious, Inflow Depth = 7.53" for 100-Year Current event 3.27 cfs @ 12.19 hrs, Volume= Inflow = 12,481 cf 3.33 cfs @ 12.20 hrs, Volume= 0.34 cfs @ 12.20 hrs, Volume= = Outflow 12,339 cf, Atten= 0%, Lag= 0.1 min Primarv = 6.695 cf Routed to Pond 10P : Underground Storage w/ Porous Pavement 5 2.98 cfs @ 12.20 hrs, Volume= Secondary = 5.645 cf Routed to Pond 10P : Underground Storage w/ Porous Pavement 5

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.63' @ 12.20 hrs Surf.Area= 1,670 sf Storage= 1,751 cf

Plug-Flow detention time= 243.7 min calculated for 12,330 cf (99% of inflow) Center-of-Mass det. time= 238.1 min (1,011.7 - 773.6)

| Volume | Invert | Avai | I.Stora | age Storage Descr | e Storage Description | |
|--|----------------------------|---|------------------------------|--|--|--|
| #1 98.25' | | | 1,75 | 1 cf Custom Stage | e Data (Conic)Listed | d below (Recalc) |
| Elevatio (fee | on Su et) | rf.Area (sq-ft) | Voids %) | s Inc.Store) (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
| 98.2 99.2 99.5 100.0 100.2 | 25 25 50 00 25 | 1,385 1,385 1,385 1,670 1,670 | 0.0 35.0 25.0 100.0 |) 0 0 485 0 87 0 763 0 418 | 0 485 571 1,334 1,751 | 1,385 1,517 1,550 1,843 1,879 |
| Device | Routing | Inv | vert | Outlet Devices | | |
| #1 | Primary | 98 | .15' | 5' 4.0" Round Culvert L= 11.0' Ke= 0.500 Inlet / Outlet Invert= 98.15' / 98.09' S= 0.0055 '/' | | 500 0.0055 '/' Cc= 0.900 terior. Flow Area= 0.09 sf |
| #2 | Device 1 | 98 | .15' | O.5" Vert. Restrictive Orifice C= 0.600 Limited to weir flow at low heads | | 0 |
| #3 | Device 2 | 98 | .25' | 4.0" Round 4" HDF Inlet / Outlet Invert= n= 0.020 Corrugate | PE Underdrain L= 2 98.25' / 98.15' S= d PE. corrugated int | 20.0' Ke= 0.500 0.0050 '/' Cc= 0.900 terior. Flow Area= 0.09 sf |
| #4 | Device 3 | 98 | .25' | 0.9" x 0.1" Horiz. P X 3 rows C= 0.600 | erforations X 400.0 Limited to weir flow | 0 columns at low heads |
| #5 | Device 1 | 100 | .00' | 4.0" Horiz. Drainted | ch Atrium C= 0.60 | 0 |
| #6 | Secondary | 100 | .10' | 3.0' long x 2.0' bre Head (feet) 0.20 0. 2.50 3.00 3.50 Coef. (English) 2.54 2.85 3.07 3.20 3.3 | adth Broad-Creste 40 0.60 0.80 1.00 2.61 2.61 2.60 2 | d Rectangular Weir 1.20 1.40 1.60 1.80 2.00 2.66 2.70 2.77 2.89 2.88 |

| Site1HillsboroughMunicpComplex_202406NOAA 24-hr C 100-Year | _Current Rainfall=8.95" |
|---|-------------------------|
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Primary OutFlow Max=0.34 cfs @ 12.20 hrs HW=100.62' (Free Discharge) 1=Culvert (Passes 0.34 cfs of 0.46 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.01 cfs @ 7.54 fps) 3=4" HDPE Underdrain (Passes 0.01 cfs of 0.36 cfs potential flow) 4=Perforations (Passes 0.01 cfs of 5.56 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.33 cfs @ 3.80 fps)

Secondary OutFlow Max=2.95 cfs @ 12.20 hrs HW=100.62' (Free Discharge) G=Broad-Crested Rectangular Weir (Weir Controls 2.95 cfs @ 1.89 fps)



Pond 9P: Proposed Rain Garden 3 (North East)

Summary for Pond 10P: Underground Storage w/ Porous Pavement 5

[44] Hint: Outlet device #3 is below defined storage[79] Warning: Submerged Pond 9P Primary device # 1 INLET by 0.32'

| Inflow Area | a = | 78,061 sf | , 72.85% Impervious, | Inflow Depth > 7 | .99" for 100-Year _Current event |
|-------------|-----|-------------|----------------------|------------------|----------------------------------|
| Inflow | = | 13.35 cfs @ | 12.19 hrs, Volume= | 51,982 cf | |
| Outflow | = | 2.51 cfs @ | 12.70 hrs, Volume= | 25,292 cf, | Atten= 81%, Lag= 30.9 min |
| Primary | = | 0.02 cfs @ | 12.70 hrs, Volume= | 3,948 cf | |
| Secondary | = | 2.49 cfs @ | 12.70 hrs, Volume= | 21,343 cf | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 98.47' @ 12.70 hrs Surf.Area= 27,852 sf Storage= 31,164 cf

Plug-Flow detention time= 514.4 min calculated for 25,292 cf (49% of inflow) Center-of-Mass det. time= 337.5 min (1,153.7 - 816.2)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 96.17' | 9,426 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 10,110 cf | 63.25'W x 181.62'L x 3.50'H Field A |
| | | | 40,205 cf Overall - 14,931 cf Embedded = 25,275 cf x 40.0% Voids |
| #3A | 96.17' | 14,931 cf | ADS_StormTech SC-740 +Cap x 325 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 325 Chambers in 13 Rows |
| | | 34.467 of | Total Available Storage |

34,467 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void %) | s Inc.Store) (cubic-feet) | Cum.Store (cubic-feet) | |
|------------------|-----------|----------------------|------------|-------------------------------|---------------------------|------------------------------|
| 96.1 | 17 | 16,365 | 0. | 0 0 | 0 | |
| 97.6 | 67 | 16,365 | 35. | 0 8,592 | 8,592 | |
| 97.8 | 33 | 16,365 | 15. | 0 393 | 8,984 | |
| 98.0 |)1 | 16,365 | 15. | 0 442 | 9,426 | |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restricti | on Orifice C= 0. | 600 |
| | - | | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | PE Underdrain L | .= 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | 92.17' / 90.37' | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. P | erforations X 40 | 0.00 columns |
| | | | | X 3 rows C= 0.600 | Limited to weir flo | ow at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bre | adth Broad-Cres | sted Rectangular Weir |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1. | 00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | | |
| | | | | Coef. (English) 2.54 | 4 2.61 2.61 2.60 | 2.66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3.3 | 32 | |

Primary OutFlow Max=0.02 cfs @ 12.70 hrs HW=98.47' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 12.16 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.48 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 9.06 cfs potential flow)

Secondary OutFlow Max=2.49 cfs @ 12.70 hrs HW=98.47' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 2.49 cfs @ 1.78 fps)

Pond 10P: Underground Storage w/ Porous Pavement 5 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

25 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 179.62' Row Length +12.0" End Stone x 2 = 181.62' Base Length 13 Rows x 51.0" Wide + 6.0" Spacing x 12 + 12.0" Side Stone x 2 = 63.25' Base Width 6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

325 Chambers x 45.9 cf = 14,930.5 cf Chamber Storage

40,205.4 cf Field - 14,930.5 cf Chambers = 25,274.9 cf Stone x 40.0% Voids = 10,110.0 cf Stone Storage

Chamber Storage + Stone Storage = 25,040.5 cf = 0.575 af Overall Storage Efficiency = 62.3% Overall System Size = 181.62' x 63.25' x 3.50'

325 Chambers 1,489.1 cy Field 936.1 cy Stone







Summary for Pond 11P: Proposed Rain Garden 2 (East)

[93] Warning: Storage range exceeded by 0.55'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

| Inflow Area | ı = | 32,033 | sf, 45.19% lr | npervious, | Inflow Depth = 7. | 44" for | 100-Year _ | Current event |
|-------------|---------|------------|---------------|------------|-------------------|-----------|-------------|---------------|
| Inflow | = | 4.92 cfs @ |) 12.22 hrs, | Volume= | 19,868 cf | | | |
| Outflow | = | 4.93 cfs @ |) 12.21 hrs, | Volume= | 19,632 cf, | Atten= 0% | 6, Lag= 0.0 |) min |
| Primary | = | 0.40 cfs @ |) 12.21 hrs, | Volume= | 9,603 cf | | - | |
| Routed | to Pond | 12P : Und | erground Sto | rage w/ Po | rous Pavement 6 | | | |
| Secondary | = | 4.53 cfs @ |) 12.21 hrs, | Volume= | 10,029 cf | | | |
| Routed | to Pond | 12P : Und | erground Sto | rage w/ Po | rous Pavement 6 | | | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 100.80' @ 12.21 hrs Surf.Area= 3,045 sf Storage= 3,267 cf

Plug-Flow detention time= 287.3 min calculated for 19,619 cf (99% of inflow) Center-of-Mass det. time= 281.3 min (1,059.0 - 777.7)

| Volume | Invert | Avail. | .Storage | Storage Descrip | tion | |
|----------|---------------------|------------|---|---|--|---|
| #1 | 98.25' | | 3,267 cf | Custom Stage I | Data (Conic)Listed | below (Recalc) |
| Elevatio | on Su | rf.Area | Voids | Inc.Store | Cum.Store | Wet.Area |
| (Tee | et) | (sq-π) | (%) | (cubic-teet) | (CUDIC-Teet) | <u>(sq-π)</u> |
| 98.2 | 25 | 2,635 | 0.0 | 0 | 0 | 2,635 |
| 99.2 | 25 | 2,635 | 35.0 | 922 | 922 | 2,817 |
| 99.5 | 50 | 2,635 | 25.0 | 165 | 1,087 | 2,862 |
| 100.0 | 00 | 3,045 | 100.0 | 1,419 | 2,506 | 3,283 |
| 100.2 | 25 | 3,045 | 100.0 | 761 | 3,267 | 3,332 |
| Device | Routing | Inv | ert Ou | tlet Devices | | |
| #1 #2 | Primary Device 1 | 98. 98. | 15' 4.0 Inle n= 15' 0.7 Lim | Round Culvert 4 / Outlet Invert= 9 0.020 Corrugated Vert. Restrictive nited to weir flow at | L= 11.0' Ke= 0.50 8.15' / 98.09' S= 0 PE, corrugated inte Orifice C= 0.600 low heads | 00 0.0055 '/' Cc= 0.900 erior, Flow Area= 0.09 sf |
| #3 | Device 2 | 98.2 | 25' 4.0 Inle n= | Round 4" HDPE t / Outlet Invert= 9 0.020 Corrugated | E Underdrain L= 20 8.25' / 98.15' S= 0 PE, corrugated inte | 0.0' Ke= 0.500 0.0050 '/' Cc= 0.900 erior, Flow Area= 0.09 sf |
| #4 | Device 3 | 98.2 | 25' 0.9 X 3 | " x 0.1" Horiz. Per | forations X 400.00 |) columns at low heads |
| #5 | Device 1 | 100.0 | 00' 4.0 | " Horiz. Draintech | Atrium C= 0.600 | |
| #6 | Secondary | 100. | 10' 3.0 He: 2.5 Co: 2.8 | ' long x 2.0' bread ad (feet) 0.20 0.40 0 3.00 3.50 ef. (English) 2.54 5 3.07 3.20 3.32 | Broad-Crested 0 0.60 0.80 1.00 2.61 2.61 2.60 2. | Rectangular Weir 1.20 1.40 1.60 1.80 2.00 66 2.70 2.77 2.89 2.88 |

| Site1HillsboroughMunicpComplex_202406NOAA 24-hr C 100-Year | _Current Rainfall=8.95" |
|---|-------------------------|
| Prepared by Rutgers Cooperative Extension Water Resources Program | Printed 6/29/2024 |
| HydroCAD® 10.10-7c s/n 03601 © 2022 HydroCAD Software Solutions LLC | Page 376 |

Primary OutFlow Max=0.39 cfs @ 12.21 hrs HW=100.79' (Free Discharge) 1=Culvert (Passes 0.39 cfs of 0.48 cfs potential flow) 2=Restrictive Orifice (Orifice Controls 0.02 cfs @ 7.78 fps) 3=4" HDPE Underdrain (Passes 0.02 cfs of 0.38 cfs potential flow) 4=Perforations (Passes 0.02 cfs of 5.75 cfs potential flow) 5=Draintech Atrium (Orifice Controls 0.37 cfs @ 4.27 fps)

Secondary OutFlow Max=4.45 cfs @ 12.21 hrs HW=100.79' (Free Discharge) 6=Broad-Crested Rectangular Weir (Weir Controls 4.45 cfs @ 2.16 fps)



Pond 11P: Proposed Rain Garden 2 (East)

Summary for Pond 12P: Underground Storage w/ Porous Pavement 6

[44] Hint: Outlet device #3 is below defined storage[79] Warning: Submerged Pond 11P Primary device # 1 INLET by 0.01'

| Inflow Area | = | 32,033 sf | 45.19% Impervious, | Inflow Depth > 7 | .35" for 100-Year _Current event |
|-------------|---|------------|--------------------|------------------|----------------------------------|
| Inflow | = | 4.93 cfs @ | 12.21 hrs, Volume= | 19,632 cf | _ |
| Outflow | = | 0.52 cfs @ | 13.45 hrs, Volume= | 9,983 cf, | Atten= 90%, Lag= 74.1 min |
| Primary | = | 0.02 cfs @ | 13.45 hrs, Volume= | 3,755 cf | - |
| Secondary | = | 0.50 cfs @ | 13.45 hrs, Volume= | 6,228 cf | |

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 98.16' @ 13.45 hrs Surf.Area= 8,364 sf Storage= 10,586 cf

Plug-Flow detention time= 797.6 min calculated for 9,976 cf (51% of inflow) Center-of-Mass det. time= 461.0 min (1,520.0 - 1,059.0)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|---|
| #1 | 96.17' | 1,866 cf | Custom Stage Data (Prismatic)Listed below (Recalc) |
| #2A | 95.67' | 4,603 cf | 25.25'W x 202.98'L x 3.50'H Field A |
| | | | 17,938 cf Overall - 6,432 cf Embedded = 11,506 cf x 40.0% Voids |
| #3A | 96.17' | 6,432 cf | ADS_StormTech SC-740 +Cap x 140 Inside #2 |
| | | | Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf |
| | | | Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap |
| | | | 140 Chambers in 5 Rows |
| | | 12 000 of | Total Available Storage |

12,900 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Elevatio (fee | on et) | Surf.Area (sq-ft) | Void (% | ds Inc.Store 6) (cubic-feet) | Cum.Store (cubic-feet) | |
|------------------|-----------|----------------------|------------|---------------------------------|---------------------------|--------------------------------|
| 96.1 | 17 | 3,239 | 0. | .0 0 | 0 | |
| 97.6 | 67 | 3,239 | 35. | .0 1,700 | 1,700 | |
| 97.8 | 33 | 3,239 | 15. | .0 78 | 1,778 | |
| 98.0 | 01 | 3,239 | 15. | .0 87 | 1,866 | |
| Device | Routing | In | vert | Outlet Devices | | |
| #1 | Primary | 92 | .07' | 0.5" Vert. Restrict | on Orifice C= 0 | .600 |
| | | | | Limited to weir flow | at low heads | |
| #2 | Device 1 | 92 | .17' | 6.0" Round 6" HD | PE Underdrain | L= 359.0' Ke= 0.500 |
| | | | | Inlet / Outlet Invert= | = 92.17' / 90.37' | S= 0.0050 '/' Cc= 0.900 |
| | | | | n= 0.020 Corrugate | ed PE, corrugated | d interior, Flow Area= 0.20 sf |
| #3 | Device 2 | 92 | .17' | 0.9" x 0.1" Horiz. F | Perforations X 40 | 0.00 columns |
| | | | | X 3 rows C= 0.600 | Limited to weir f | low at low heads |
| #4 | Seconda | ry 98 | .00' | 3.0' long x 2.0' bro | eadth Broad-Cre | sted Rectangular Weir |
| | | | | Head (feet) 0.20 0 | .40 0.60 0.80 1 | .00 1.20 1.40 1.60 1.80 2.00 |
| | | | | 2.50 3.00 3.50 | | |
| | | | | Coef. (English) 2.5 | 4 2.61 2.61 2.6 | 0 2.66 2.70 2.77 2.89 2.88 |
| | | | | 2.85 3.07 3.20 3.3 | 32 | |

Primary OutFlow Max=0.02 cfs @ 13.45 hrs HW=98.16' (Free Discharge) 1=Restriction Orifice (Orifice Controls 0.02 cfs @ 11.86 fps) 2=6" HDPE Underdrain (Passes 0.02 cfs of 0.47 cfs potential flow) 3=Perforations (Passes 0.02 cfs of 8.84 cfs potential flow)

Secondary OutFlow Max=0.50 cfs @ 13.45 hrs HW=98.16' (Free Discharge) 4=Broad-Crested Rectangular Weir (Weir Controls 0.50 cfs @ 1.02 fps)

Pond 12P: Underground Storage w/ Porous Pavement 6 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length) Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

28 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 200.98' Row Length +12.0" End Stone x 2 = 202.98' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

140 Chambers x 45.9 cf = 6,431.6 cf Chamber Storage

17,938.1 cf Field - 6,431.6 cf Chambers = 11,506.5 cf Stone x 40.0% Voids = 4,602.6 cf Stone Storage

Chamber Storage + Stone Storage = 11,034.2 cf = 0.253 af Overall Storage Efficiency = 61.5% Overall System Size = 202.98' x 25.25' x 3.50'

140 Chambers 664.4 cy Field 426.2 cy Stone



Pond 12P: Underground Storage w/ Porous Pavement 6

Summary for Link 1L: Offsite Flows

| Inflow / | Area = | 927,363 sf, | 3.35% Impervious, | Inflow Depth = | 5.86" | for ´ | 100-Year | Current event |
|----------|--------|---------------|--------------------|----------------|----------|-------|-----------|---------------|
| Inflow | = | 88.88 cfs @ 1 | 12.32 hrs, Volume= | 453,197 cf | f | | | |
| Primar | y = | 88.88 cfs @ 1 | 12.32 hrs, Volume= | 453,197 cf | f, Atten | i= 0% | , Lag= 0. | 0 min |

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 1L: Offsite Flows

