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DRAINAGE REPORT LOT 3.02, BLOCK 562 BRYANT AVENUE CRAFORD, UNION COUNTY, NJ

Prepared by
Edward S. Dec, PE
January 20, 2021

The property in question is located on the westerly side of Bryant Avenue, south of Dermody Street in the Township of Cranford, Union County, NJ. The property is undeveloped. The property presently consists of two parcels, lot 2 and lot 3, block 562 on the tax map of the township of Cranford. This report is only dealing with proposed lot 1.02.

The soil in this area is "BovB Boonton - Urban Land which is a type "C" soils group. We are using the rational method in "Hydraflow - Hydrographs for the existing conditions while using the modified rational method hydrographs for the maximum storage required. Rainfall curves in the program are taken from the NOAA 2019. We have used the minimum required ten minute time of concentration for the existing and proposed condition. We used the exiting "C" of 0.63, open space fair conditions and the proposed development will have a "C" of 0.99. Lot 1.01 has a proposed area of 10,212. SF

The existing runoff for this site has been calculated using the rational Method and yield the following flow rates:

| | |
|------------------------|----------|
| Two-year storm | 0.57 CFS |
| Ten-year storm | 0.76 CFS |
| One-hundred-year storm | 0.99 CFS |

The proposed grading of the property will result in 3382 sf of the parcel discharging directly off the property. Runoff from the remaining 6830 sf will be collected and discharge into the detention system. The detention system for this property will consist of six rows of 15" Perforated ADS pipe, each 40 feet in length, connected together with a manifold system with a total available pipe capacity of 321 Cubic Feet. The pipe is backfilled in ¾" clean stone resulting in an additional 119 CF of storm water capacity. In calculating flows for the proposed conditions, the Modified Rational Method has been used which yields the largest required volume for a given storm. Two, 2.5 inch orifice outlets are set at elevation 97.00' the bottom of the detention system and a second orifice, 4.5" diameter, is set at elevation 97.60.

The resulting flows for the three storms are listed below:

| | Storage | Storage Elevation | Outlet Discharge | Direct Discharge | Total Discharge |
|------------------------|---------|-------------------|------------------|------------------|-----------------|
| Two-year storm | 238 CF | 97.68' | 0.21 CFS | 0.19 cfs | 0.25 cfs |
| Ten-year storm | 293 CF | 97.82" | 0.34 CFS | 0.25 cfs | 0.34 cfs |
| One-hundred-year storm | 404 CF | 98.13' | 0.61 CFS | 0.40 cfs | 0.65 cfs |

For the reduction in flow, the discharge for all storms and their performance relative to the RSIS standards are shown below:

| | Existing Flow-rate | allowable Flow rate | Allowable percentage | Proposed Flow Rate |
|-------------------------|-----------------------|------------------------|-------------------------|-----------------------|
| Two-year storm | 0.57 CFS | 0.28 CFS | 50 % | 0.25 cfs |
| Ten-year storm | 0.76 CFS | 0.57 CFS | 75 % | 0.34 cfs |
| One-hundred- year storm | 0.99 CFS | 0.78 CFS | 80 % | 0.65 cfs |

I have attached a copy of the existing hydrographs for the three storms and the critical T/C for each storm which generates the maximum storage and well as a summary page for each of the storms reflecting the various computations made to arrive at the critical time of concentration.

COEFFICIENT OF RUNOFF CALCULATIONS

PROJECT: 127 BYRANT AVENUE, CRANFORD NJ LOT 1.02
 SOIL GROUP BOONTON URBAN "BovB" Type "c"

EXISTING RUNOFF

HYDRAULIC SOILS GROUP: C BovB

| TYPE OF IMPROVMENT | AREA (SF) | AREA ACRES) | % | C" | wt/c |
|--------------------|--------------|----------------|---|------|------|
| OPEN SPACE-FAIR | 10212 | 0.2344353 | 1 | 0.63 | 0.63 |
| PAVEMENT/BLDG. | 0 | 0 | 0 | 0.99 | 0 |
| TOTAL | 10212 | 0.2344353 | 1 | | 0.63 |

PROPOSED RUNOFF - TOTAL

HYDRAULIC SOILS GROUP: C BovB

| TYPE OF IMPROVMENT | AREA (SF) | AREA ACRES) | % | C" | wt/c |
|--------------------|--------------|----------------|-----------|------|-----------|
| OPEN SPACE - FAIR | 7463 | 0.1713269 | 0.7308069 | 0.63 | 0.4604083 |
| PAVEMENT/BLDG. | 2749 | 0.0631084 | 0.2691931 | 0.99 | 0.2665012 |
| TOTAL | 10212 | 0.2344353 | 1 | | 0.7269095 |

DIRECT RUNOFF

HYDRAULIC SOILS GROUP: C BovB

| TYPE OF IMPROVMENT | AREA (SF) | AREA ACRES) | % | C" | wt/c |
|--------------------|--------------|----------------|-------|------|-------|
| OPEN SPACE-FAIR | 3382 | 0.07764 | #REF! | 0.63 | #REF! |

PROPOSED RUNOFF TO DETENTION

HYDRAULIC SOILS GROUP: C

| TYPE OF IMPROVMENT | AREA (SF) | AREA ACRES) | % | C" | wt/c |
|--------------------|--------------|----------------|----------|------|-----------|
| OPEN -FAIR | 4081 | 0.0936869 | 0.597511 | 0.63 | 0.3764319 |
| PAVEMENT/BLDG. | 2749 | 0.0631084 | 0.402489 | 0.99 | 0.3984641 |
| TOTAL | 6830 | 0.1567952 | 1 | | 0.774896 |

TOTAL 10212

Hydrograph Summary Report

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Volume (cuft) | Inflow hyd(s) | Maximum elevation (ft) | Maximum storage (cuft) | Hydrograph description |
|----------|--------------------------|-----------------|---------------------|--------------------|---------------|---------------|------------------------|------------------------|------------------------|
| 1 | Rational | 0.57 | 1 | 10 | 341 | --- | --- | --- | XISTINF FLOW - 1.02 |

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Mar 1 2021, 11:23 AM

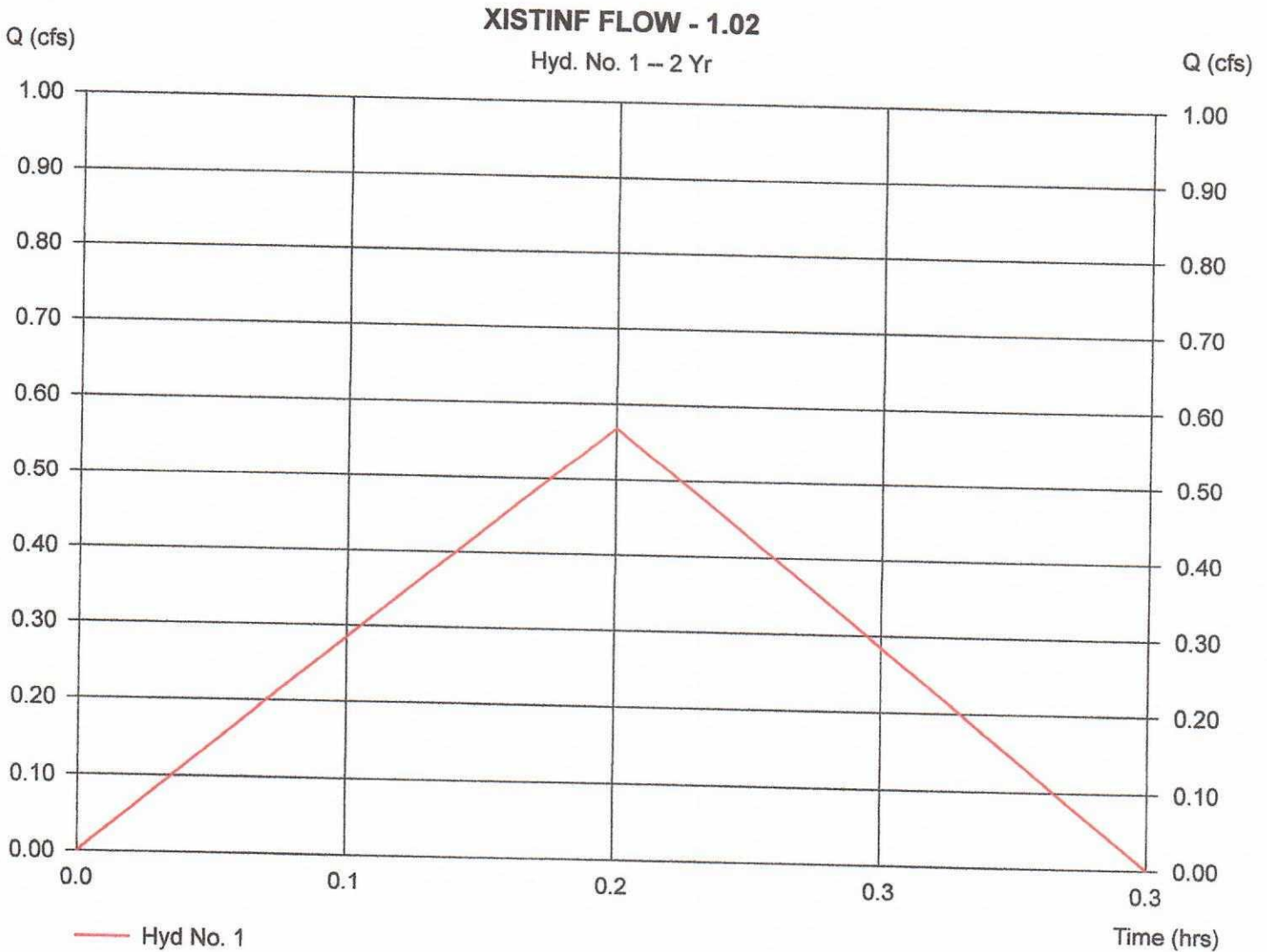
Hyd. No. 1

XISTINF FLOW - 1.02

Hydrograph type = Rational
Storm frequency = 2 yrs
Drainage area = 0.234 ac
Intensity = 3.852 in/hr
IDF Curve = NOAA, 2019.IDF

Peak discharge = 0.57 cfs
Time interval = 1 min
Runoff coeff. = 0.63
Tc by User = 10.00 min
Asc/Rec limb fact = 1/1

Hydrograph Volume = 341 cuft



Hydrograph Summary Report

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Volume (cuft) | Inflow hyd(s) | Maximum elevation (ft) | Maximum storage (cuft) | Hydrograph description |
|----------|--------------------------|-----------------|---------------------|--------------------|---------------|---------------|------------------------|------------------------|------------------------|
| 1 | Rational | 0.76 | 1 | 10 | 455 | --- | --- | --- | XISTINF FLOW - 1.02 |

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Mar 1 2021, 11:23 AM

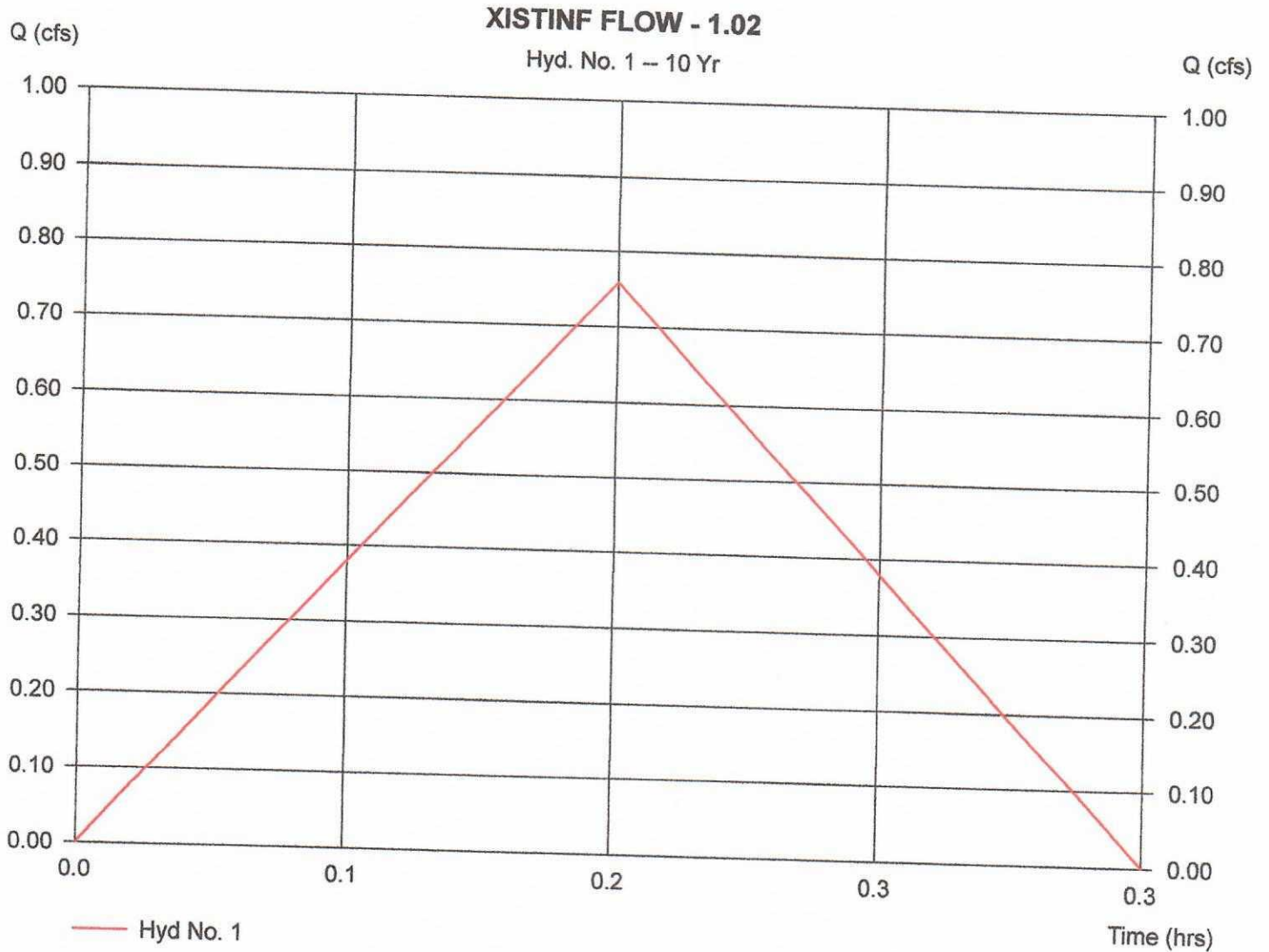
Hyd. No. 1

XISTINF FLOW - 1.02

Hydrograph type = Rational
Storm frequency = 10 yrs
Drainage area = 0.234 ac
Intensity = 5.139 in/hr
IDF Curve = NOAA, 2019.IDF

Peak discharge = 0.76 cfs
Time interval = 1 min
Runoff coeff. = 0.63
Tc by User = 10.00 min
Asc/Rec limb fact = 1/1

Hydrograph Volume = 455 cuft



Hydrograph Summary Report

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Volume (cuft) | Inflow hyd(s) | Maximum elevation (ft) | Maximum storage (cuft) | Hydrograph description |
|---------------------------|--------------------------|-----------------|---------------------|--------------------|-------------------------|---------------|------------------------------|------------------------|------------------------|
| 1 | Rational | 0.99 | 1 | 10 | 591 | --- | --- | --- | XISTINF FLOW - 1.02 |
| EXITING FLOW LOT 1.02.gpw | | | | | Return Period: 100 Year | | Monday, Mar 1 2021, 11:23 AM | | |

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Mar 1 2021, 11:23 AM

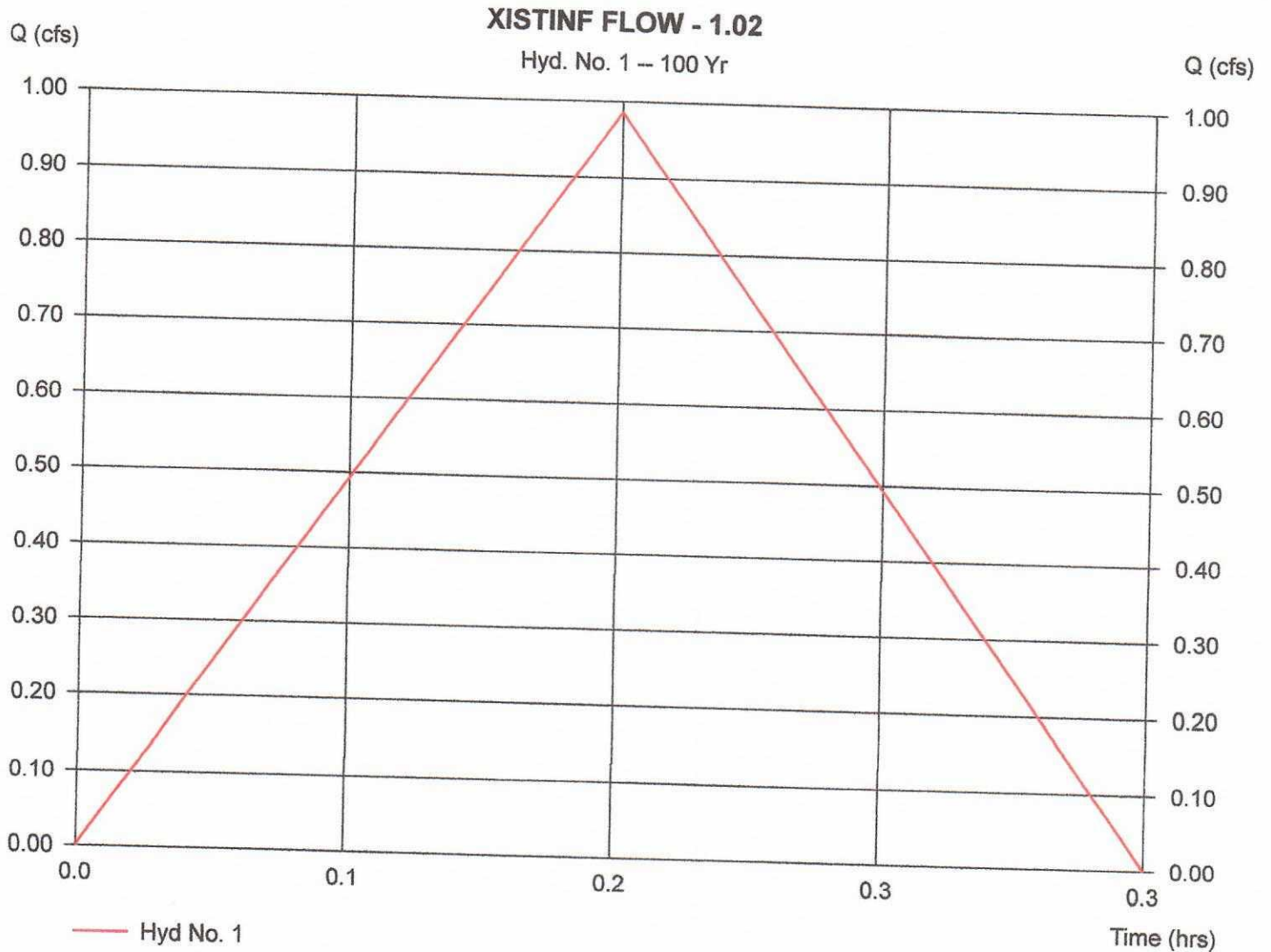
Hyd. No. 1

XISTINF FLOW - 1.02

Hydrograph type = Rational
Storm frequency = 100 yrs
Drainage area = 0.234 ac
Intensity = 6.674 in/hr
IDF Curve = NOAA, 2019.IDF

Peak discharge = 0.99 cfs
Time interval = 1 min
Runoff coeff. = 0.63
Tc by User = 10.00 min
Asc/Rec limb fact = 1/1

Hydrograph Volume = 591 cuft



Pond Report

Hydraflow Hydrographs by Intelisolve

Monday, Mar 1 2021, 12:1 PM

Pond No. 1 - POND LOT 1.02

Pond Data

Pond storage is based on known values

Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00 | 97.00 | 00 | 0 | 0 |
| 0.06 | 97.06 | 00 | 13 | 13 |
| 0.13 | 97.13 | 00 | 19 | 32 |
| 0.19 | 97.19 | 00 | 20 | 52 |
| 0.25 | 97.25 | 00 | 21 | 73 |
| 0.32 | 97.32 | 00 | 22 | 95 |
| 0.38 | 97.38 | 00 | 27 | 122 |
| 0.44 | 97.44 | 00 | 23 | 145 |
| 0.51 | 97.51 | 00 | 26 | 171 |
| 0.57 | 97.57 | 00 | 25 | 196 |
| 0.63 | 97.63 | 00 | 24 | 220 |
| 0.70 | 97.70 | 00 | 24 | 244 |
| 0.76 | 97.76 | 00 | 25 | 269 |
| 0.83 | 97.83 | 00 | 26 | 295 |
| 0.89 | 97.89 | 00 | 23 | 318 |
| 0.95 | 97.95 | 00 | 25 | 343 |
| 1.02 | 98.02 | 00 | 24 | 367 |
| 1.08 | 98.08 | 00 | 21 | 388 |
| 1.14 | 98.14 | 00 | 20 | 408 |
| 1.21 | 98.21 | 00 | 19 | 427 |
| 1.28 | 98.28 | 00 | 13 | 440 |

Culvert / Orifice Structures

| | [A] | [B] | [C] | [D] |
|-----------------|---------|-------|-------|------|
| Rise (in) | = 2.50 | 4.50 | 2.50 | 0.00 |
| Span (in) | = 2.50 | 4.50 | 2.50 | 0.00 |
| No. Barrels | = 1 | 1 | 1 | 0 |
| Invert El. (ft) | = 97.00 | 97.60 | 97.40 | 0.00 |
| Length (ft) | = 0.00 | 0.00 | 0.00 | 0.00 |
| Slope (%) | = 0.00 | 0.00 | 0.00 | 0.00 |
| N-Value | = .013 | .013 | .013 | .000 |
| Orif. Coeff. | = 0.60 | 0.60 | 0.60 | 0.00 |
| Multi-Stage | = n/a | No | No | No |

Weir Structures

| | [A] | [B] | [C] | [D] |
|----------------|--------|------|------|------|
| Crest Len (ft) | = 0.00 | 0.00 | 0.00 | 0.00 |
| Crest El. (ft) | = 0.00 | 0.00 | 0.00 | 0.00 |
| Weir Coeff. | = 0.00 | 3.33 | 3.33 | 0.00 |
| Weir Type | = -- | -- | -- | -- |
| Multi-Stage | = No | No | No | No |

Exfiltration = 0.000 in/hr (Wet area) Tailwater Elev. = 0.00 ft

Stage / Storage / Discharge Table

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.

| Stage ft | Storage cuft | Elevation ft | Civ A cfs | Civ B cfs | Civ C cfs | Civ D cfs | Wr A cfs | Wr B cfs | Wr C cfs | Wr D cfs | Exfil cfs | Total cfs |
|----------|--------------|--------------|-----------|-----------|-----------|-----------|----------|----------|----------|----------|-----------|-----------|
| 0.00 | 0 | 97.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- | -- | -- | -- | 0.00 |
| 0.06 | 13 | 97.06 | 0.01 | 0.00 | 0.00 | -- | -- | -- | -- | -- | -- | 0.01 |
| 0.13 | 32 | 97.13 | 0.03 | 0.00 | 0.00 | -- | -- | -- | -- | -- | -- | 0.03 |
| 0.19 | 52 | 97.19 | 0.05 | 0.00 | 0.00 | -- | -- | -- | -- | -- | -- | 0.05 |
| 0.25 | 73 | 97.25 | 0.06 | 0.00 | 0.00 | -- | -- | -- | -- | -- | -- | 0.06 |
| 0.32 | 95 | 97.32 | 0.08 | 0.00 | 0.00 | -- | -- | -- | -- | -- | -- | 0.08 |
| 0.38 | 122 | 97.38 | 0.09 | 0.00 | 0.00 | -- | -- | -- | -- | -- | -- | 0.09 |
| 0.44 | 145 | 97.44 | 0.10 | 0.00 | 0.00 | -- | -- | -- | -- | -- | -- | 0.10 |
| 0.51 | 171 | 97.51 | 0.10 | 0.00 | 0.02 | -- | -- | -- | -- | -- | -- | 0.12 |
| 0.57 | 196 | 97.57 | 0.11 | 0.00 | 0.04 | -- | -- | -- | -- | -- | -- | 0.15 |
| 0.63 | 220 | 97.63 | 0.12 | 0.00 | 0.06 | -- | -- | -- | -- | -- | -- | 0.18 |
| 0.70 | 244 | 97.70 | 0.13 | 0.03 | 0.07 | -- | -- | -- | -- | -- | -- | 0.22 |
| 0.76 | 269 | 97.76 | 0.13 | 0.06 | 0.08 | -- | -- | -- | -- | -- | -- | 0.28 |
| 0.83 | 295 | 97.83 | 0.14 | 0.12 | 0.09 | -- | -- | -- | -- | -- | -- | 0.35 |
| 0.89 | 318 | 97.89 | 0.15 | 0.17 | 0.10 | -- | -- | -- | -- | -- | -- | 0.42 |
| 0.95 | 343 | 97.95 | 0.15 | 0.22 | 0.11 | -- | -- | -- | -- | -- | -- | 0.48 |
| 1.02 | 367 | 98.02 | 0.16 | 0.26 | 0.12 | -- | -- | -- | -- | -- | -- | 0.53 |
| 1.08 | 388 | 98.08 | 0.16 | 0.29 | 0.12 | -- | -- | -- | -- | -- | -- | 0.57 |
| 1.14 | 408 | 98.14 | 0.17 | 0.32 | 0.13 | -- | -- | -- | -- | -- | -- | 0.61 |
| 1.21 | 427 | 98.21 | 0.17 | 0.35 | 0.14 | -- | -- | -- | -- | -- | -- | 0.66 |
| 1.28 | 440 | 98.28 | 0.18 | 0.37 | 0.14 | -- | -- | -- | -- | -- | -- | 0.70 |

Pond Report

Hydraflow Hydrographs by Intelisolve

Monday, Mar 1 2021, 8:10 AM

Pond No. 1 - New Pond1 POND LOT 1.02

Pond Data

Pond storage is based on known values

Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00 | 97.00 | 00 | 0 | 0 |
| 0.06 | 97.06 | 00 | 13 | 13 |
| 0.13 | 97.13 | 00 | 19 | 32 |
| 0.19 | 97.19 | 00 | 20 | 52 |
| 0.25 | 97.25 | 00 | 21 | 73 |
| 0.32 | 97.32 | 00 | 22 | 95 |
| 0.38 | 97.38 | 00 | 27 | 122 |
| 0.44 | 97.44 | 00 | 23 | 145 |
| 0.51 | 97.51 | 00 | 26 | 171 |
| 0.57 | 97.57 | 00 | 25 | 196 |
| 0.63 | 97.63 | 00 | 24 | 220 |
| 0.70 | 97.70 | 00 | 24 | 244 |
| 0.76 | 97.76 | 00 | 25 | 269 |
| 0.83 | 97.83 | 00 | 26 | 295 |
| 0.89 | 97.89 | 00 | 23 | 318 |
| 0.95 | 97.95 | 00 | 25 | 343 |
| 1.02 | 98.02 | 00 | 24 | 367 |
| 1.08 | 98.08 | 00 | 21 | 388 |
| 1.14 | 98.14 | 00 | 20 | 408 |
| 1.21 | 98.21 | 00 | 19 | 427 |
| 1.27 | 98.27 | 00 | 13 | 440 |

Culvert / Orifice Structures

| | [A] | [B] | [C] | [D] |
|-----------------|---------|-------|-------|------|
| Rise (in) | = 2.50 | 4.50 | 2.50 | 0.00 |
| Span (in) | = 2.50 | 4.50 | 2.50 | 0.00 |
| No. Barrels | = 1 | 1 | 1 | 0 |
| Invert El. (ft) | = 97.00 | 97.60 | 97.40 | 0.00 |
| Length (ft) | = 0.00 | 0.00 | 0.00 | 0.00 |
| Slope (%) | = 0.00 | 0.00 | 0.00 | 0.00 |
| N-Value | = .013 | .013 | .013 | .000 |
| Orif. Coeff. | = 0.60 | 0.60 | 0.60 | 0.00 |
| Multi-Stage | = n/a | No | No | No |

Weir Structures

| | [A] | [B] | [C] | [D] |
|----------------|--------|------|------|------|
| Crest Len (ft) | = 0.00 | 0.00 | 0.00 | 0.00 |
| Crest El. (ft) | = 0.00 | 0.00 | 0.00 | 0.00 |
| Weir Coeff. | = 0.00 | 3.33 | 0.00 | 0.00 |
| Weir Type | = -- | -- | -- | -- |
| Multi-Stage | = No | No | No | No |

Exfiltration = 0.000 in/hr (Wet area) Tailwater Elev. = 0.00 ft

Stage / Storage / Discharge Table

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.

| Stage ft | Storage cuft | Elevation ft | Civ A cfs | Civ B cfs | Civ C cfs | Civ D cfs | Wr A cfs | Wr B cfs | Wr C cfs | Wr D cfs | Exfil cfs | Total cfs |
|----------|--------------|--------------|-----------|-----------|-----------|-----------|----------|----------|----------|----------|-----------|-----------|
| 0.00 | 0 | 97.00 | 0.00 | 0.00 | 0.00 | -- | -- | -- | -- | -- | -- | 0.00 |
| 0.06 | 13 | 97.06 | 0.01 | 0.00 | 0.00 | -- | -- | -- | -- | -- | -- | 0.01 |
| 0.13 | 32 | 97.13 | 0.03 | 0.00 | 0.00 | -- | -- | -- | -- | -- | -- | 0.03 |
| 0.19 | 52 | 97.19 | 0.05 | 0.00 | 0.00 | -- | -- | -- | -- | -- | -- | 0.05 |
| 0.25 | 73 | 97.25 | 0.06 | 0.00 | 0.00 | -- | -- | -- | -- | -- | -- | 0.06 |
| 0.32 | 95 | 97.32 | 0.08 | 0.00 | 0.00 | -- | -- | -- | -- | -- | -- | 0.08 |
| 0.38 | 122 | 97.38 | 0.09 | 0.00 | 0.00 | -- | -- | -- | -- | -- | -- | 0.09 |
| 0.44 | 145 | 97.44 | 0.10 | 0.00 | 0.00 | -- | -- | -- | -- | -- | -- | 0.10 |
| 0.51 | 171 | 97.51 | 0.10 | 0.00 | 0.02 | -- | -- | -- | -- | -- | -- | 0.12 |
| 0.57 | 196 | 97.57 | 0.11 | 0.00 | 0.04 | -- | -- | -- | -- | -- | -- | 0.15 |
| 0.63 | 220 | 97.63 | 0.12 | 0.00 | 0.06 | -- | -- | -- | -- | -- | -- | 0.18 |
| 0.70 | 244 | 97.70 | 0.13 | 0.03 | 0.07 | -- | -- | -- | -- | -- | -- | 0.22 |
| 0.76 | 269 | 97.76 | 0.13 | 0.06 | 0.08 | -- | -- | -- | -- | -- | -- | 0.28 |
| 0.83 | 295 | 97.83 | 0.14 | 0.12 | 0.09 | -- | -- | -- | -- | -- | -- | 0.35 |
| 0.89 | 318 | 97.89 | 0.15 | 0.17 | 0.10 | -- | -- | -- | -- | -- | -- | 0.42 |
| 0.95 | 343 | 97.95 | 0.15 | 0.22 | 0.11 | -- | -- | -- | -- | -- | -- | 0.48 |
| 1.02 | 367 | 98.02 | 0.16 | 0.26 | 0.12 | -- | -- | -- | -- | -- | -- | 0.53 |
| 1.08 | 388 | 98.08 | 0.16 | 0.29 | 0.12 | -- | -- | -- | -- | -- | -- | 0.57 |
| 1.14 | 408 | 98.14 | 0.17 | 0.32 | 0.13 | -- | -- | -- | -- | -- | -- | 0.61 |
| 1.21 | 427 | 98.21 | 0.17 | 0.35 | 0.14 | -- | -- | -- | -- | -- | -- | 0.66 |
| 1.27 | 440 | 98.27 | 0.18 | 0.37 | 0.14 | -- | -- | -- | -- | -- | -- | 0.69 |

Hydrograph Summary Report

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Volume (cuft) | Inflow hyd(s) | Maximum elevation (ft) | Maximum storage (cuft) | Hydrograph description |
|----------|--------------------------|-----------------|---------------------|--------------------|---------------|---------------|------------------------|------------------------|----------------------------|
| 1 | Rational | 0.19 | 1 | 10 | 113 | --- | --- | --- | DIRECT RUNOFF LOT 1.02 |
| 2 | Rational | 0.47 | 1 | 10 | 279 | --- | --- | --- | RUNOFF TO DETENTIOC T/C-10 |
| 3 | Reservoir | 0.15 | 1 | 17 | 274 | 2 | 97.56 | 193 | ROUTING T/C-10 |
| 4 | Combine | 0.27 | 1 | 10 | 387 | 1, 3 | --- | --- | ROUTING T/C-10 |
| 5 | Mod. Rational | 0.34 | 1 | 10 | 406 | --- | --- | --- | TO DETENTION T/C-20 |
| 6 | Reservoir | 0.21 | 1 | 24 | 401 | 5 | 97.68 | 236 | ROUTING T/C-20 |
| 7 | Combine | 0.26 | 1 | 10 | 514 | 1, 6 | --- | --- | TOTAL RUNOFF T/C-20 |
| 8 | Mod. Rational | 0.27 | 1 | 10 | 482 | --- | --- | --- | TO DETENTINO T/C-30 |
| 9 | Reservoir | 0.21 | 1 | 32 | 478 | 8 | 97.68 | 238 | ROUTING T/C-30 |
| 10 | Combine | 0.25 | 1 | 10 | 591 | 1, 9 | --- | --- | TOTAL RUNOFF T/C-30 |
| 11 | Mod. Rational | 0.22 | 1 | 10 | 535 | --- | --- | --- | TO DETENTION T/C-40 |
| 12 | Reservoir | 0.19 | 1 | 41 | 530 | 11 | 97.66 | 229 | ROUTING T/C-40 |

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Mar 1 2021, 8:7 AM

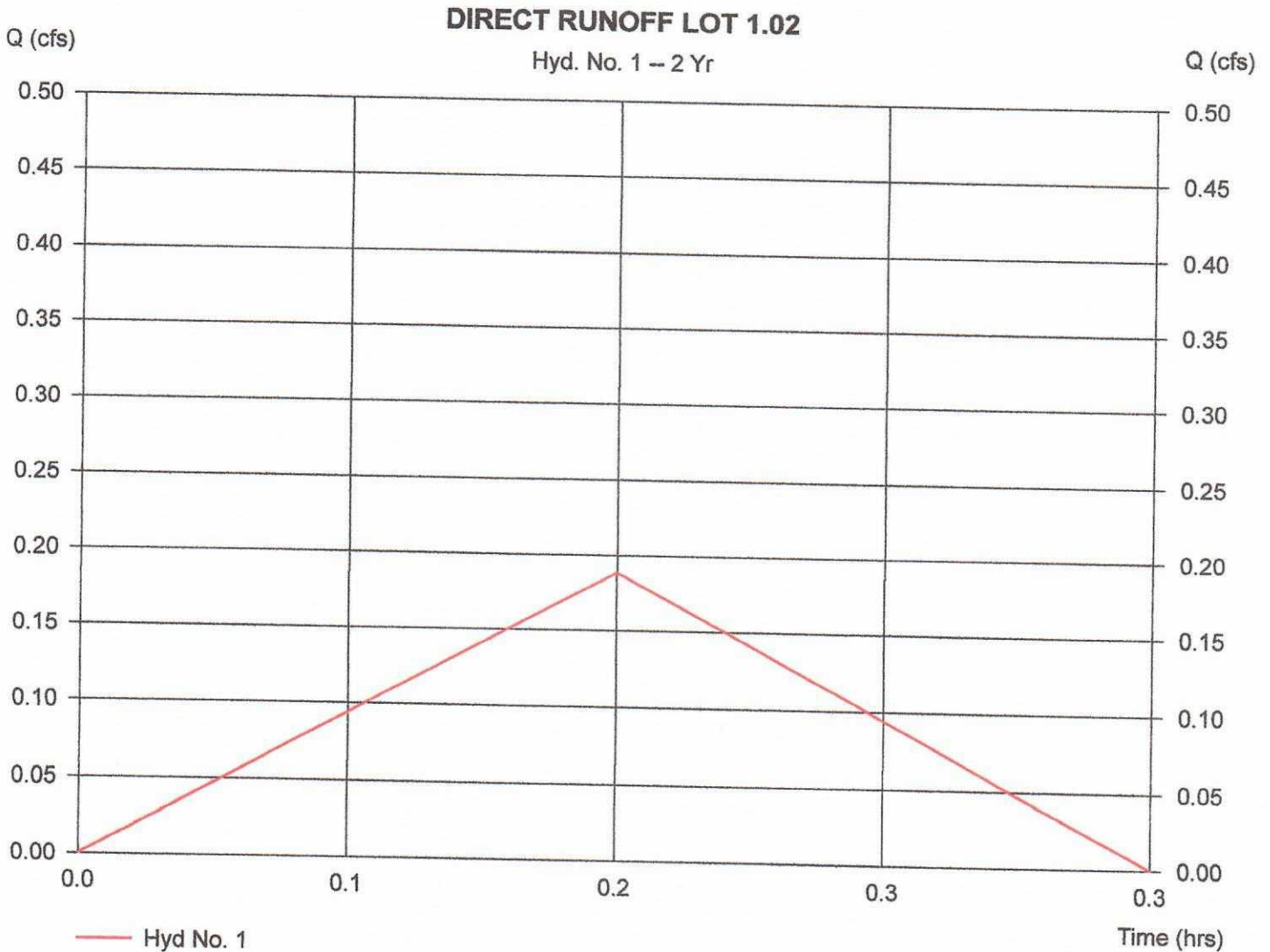
Hyd. No. 1

DIRECT RUNOFF LOT 1.02

Hydrograph type = Rational
Storm frequency = 2 yrs
Drainage area = 0.078 ac
Intensity = 3.852 in/hr
IDF Curve = NOAA, 2019.IDF

Peak discharge = 0.19 cfs
Time interval = 1 min
Runoff coeff. = 0.63
Tc by User = 10.00 min
Asc/Rec limb fact = 1/1

Hydrograph Volume = 113 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Mar 1 2021, 8:9 AM

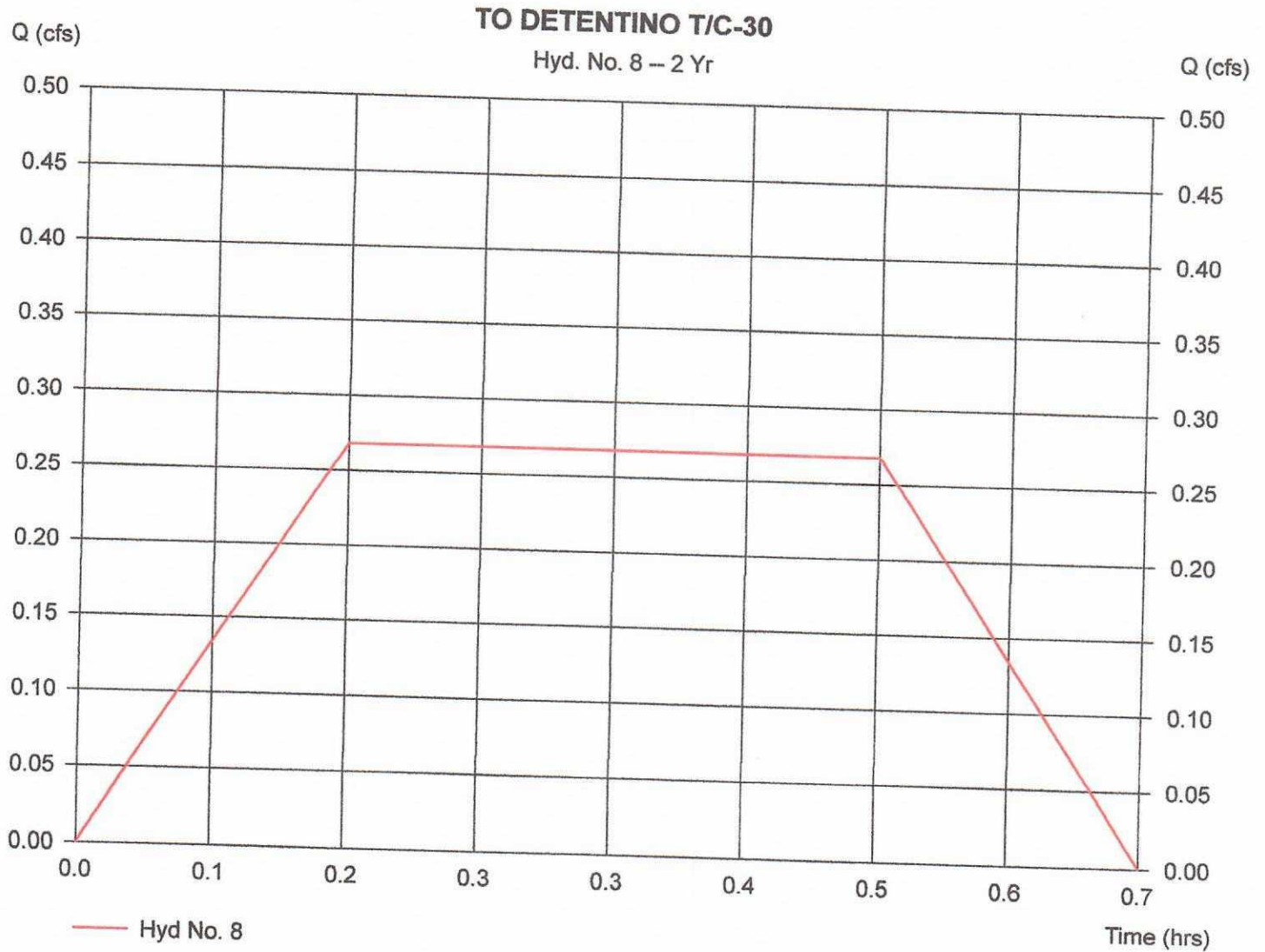
Hyd. No. 8

TO DETENTINO T/C-30

Hydrograph type = Mod. Rational
Storm frequency = 2 yrs
Drainage area = 0.157 ac
Intensity = 2.220 in/hr
IDF Curve = NOAA, 2019.IDF

Peak discharge = 0.27 cfs
Time interval = 1 min
Runoff coeff. = 0.77
Tc by User = 10.00 min
Storm duration = 3 x Tc

Hydrograph Volume = 482 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Mar 1 2021, 8:9 AM

Hyd. No. 9

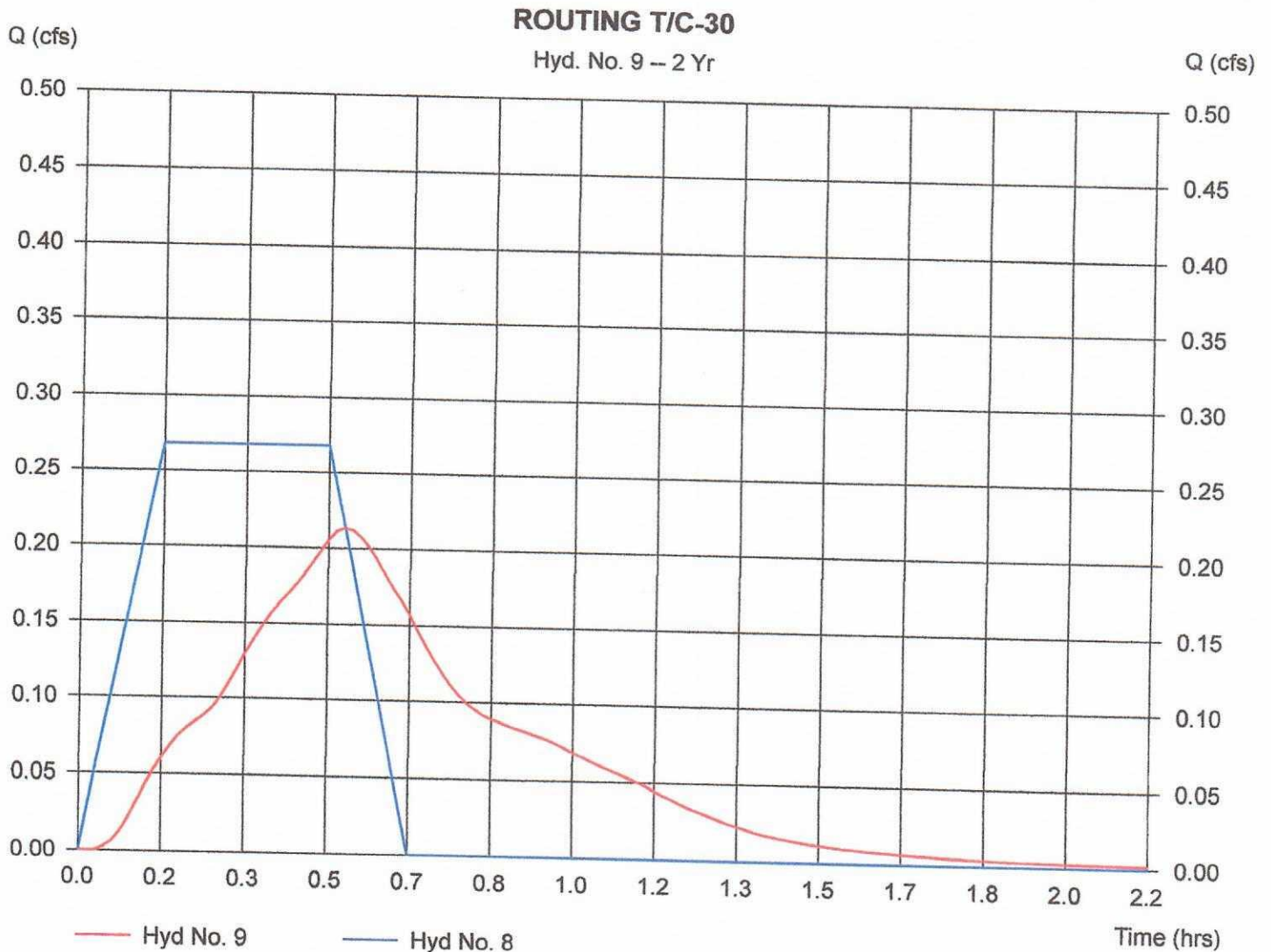
ROUTING T/C-30

Hydrograph type = Reservoir
Storm frequency = 2 yrs
Inflow hyd. No. = 8
Reservoir name = New Pond1 POND LOT 1.02

Peak discharge = 0.21 cfs
Time interval = 1 min
Max. Elevation = 97.68 ft
Max. Storage = 238 cuft

Storage Indication method used.

Hydrograph Volume = 478 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Mar 1 2021, 8:9 AM

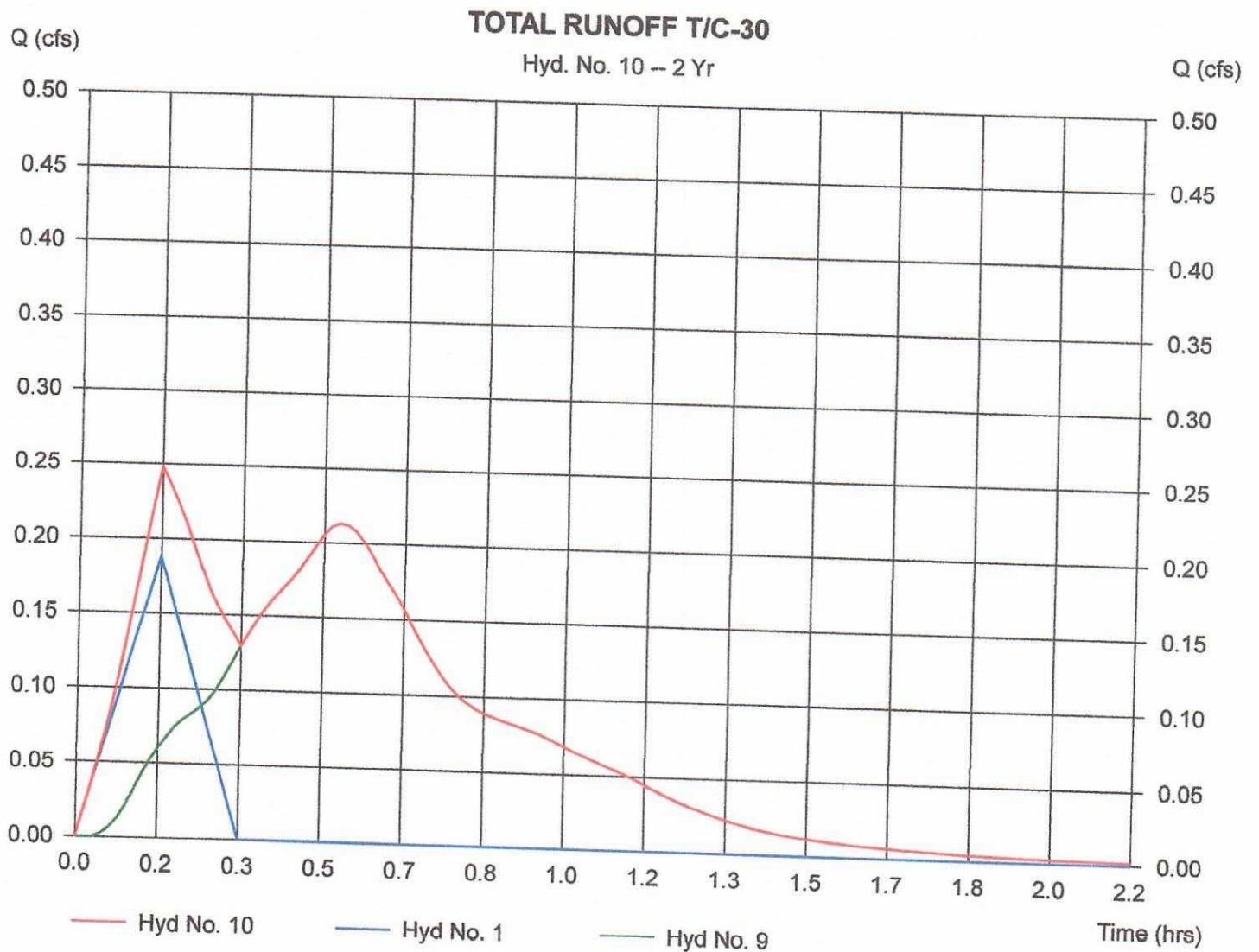
Hyd. No. 10

TOTAL RUNOFF T/C-30

Hydrograph type = Combine
Storm frequency = 2 yrs
Inflow hyds. = 1, 9

Peak discharge = 0.25 cfs
Time interval = 1 min

Hydrograph Volume = 591 cuft



Hydrograph Summary Report

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Volume (cuft) | Inflow hyd(s) | Maximum elevation (ft) | Maximum storage (cuft) | Hydrograph description |
|----------|--------------------------|-----------------|---------------------|--------------------|---------------|---------------|------------------------|------------------------|----------------------------|
| 1 | Rational | 0.25 | 1 | 10 | 151 | — | — | — | DIRECT RUNOFF LOT 1.02 |
| 2 | Rational | 0.62 | 1 | 10 | 372 | — | — | — | RUNOFF TO DETENTIOC T/C-10 |
| 3 | Reservoir | 0.24 | 1 | 16 | 367 | 2 | 97.71 | 250 | ROUTING T/C-10 |
| 4 | Combine | 0.37 | 1 | 11 | 518 | 1, 3 | — | — | ROUTING T/C-10 |
| 5 | Mod. Rational | 0.46 | 1 | 10 | 554 | — | — | — | TO DETENTION T/C-20 |
| 6 | Reservoir | 0.34 | 1 | 23 | 549 | 5 | 97.82 | 293 | ROUTING T/C-20 |
| 7 | Combine | 0.34 | 1 | 23 | 700 | 1, 6 | — | — | TOTAL RUNOFF T/C-20 |
| 8 | Mod. Rational | 0.37 | 1 | 10 | 669 | — | — | — | TO DETENTINO T/C-30 |
| 9 | Reservoir | 0.34 | 1 | 31 | 665 | 8 | 97.82 | 291 | ROUTING T/C-30 |
| 10 | Combine | 0.34 | 1 | 31 | 815 | 1, 9 | — | — | TOTAL RUNOFF T/C-30 |
| 11 | Mod. Rational | 0.31 | 1 | 10 | 752 | — | — | — | TO DETENTION T/C-40 |
| 12 | Reservoir | 0.30 | 1 | 40 | 748 | 11 | 97.79 | 279 | ROUTING T/C-40 |

PROPOSED 2 & 10 YR-LOT 1.02.gpw Return Period: 10 Year

Monday, Mar 1 2021, 8:07 AM

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Mar 1 2021, 8:7 AM

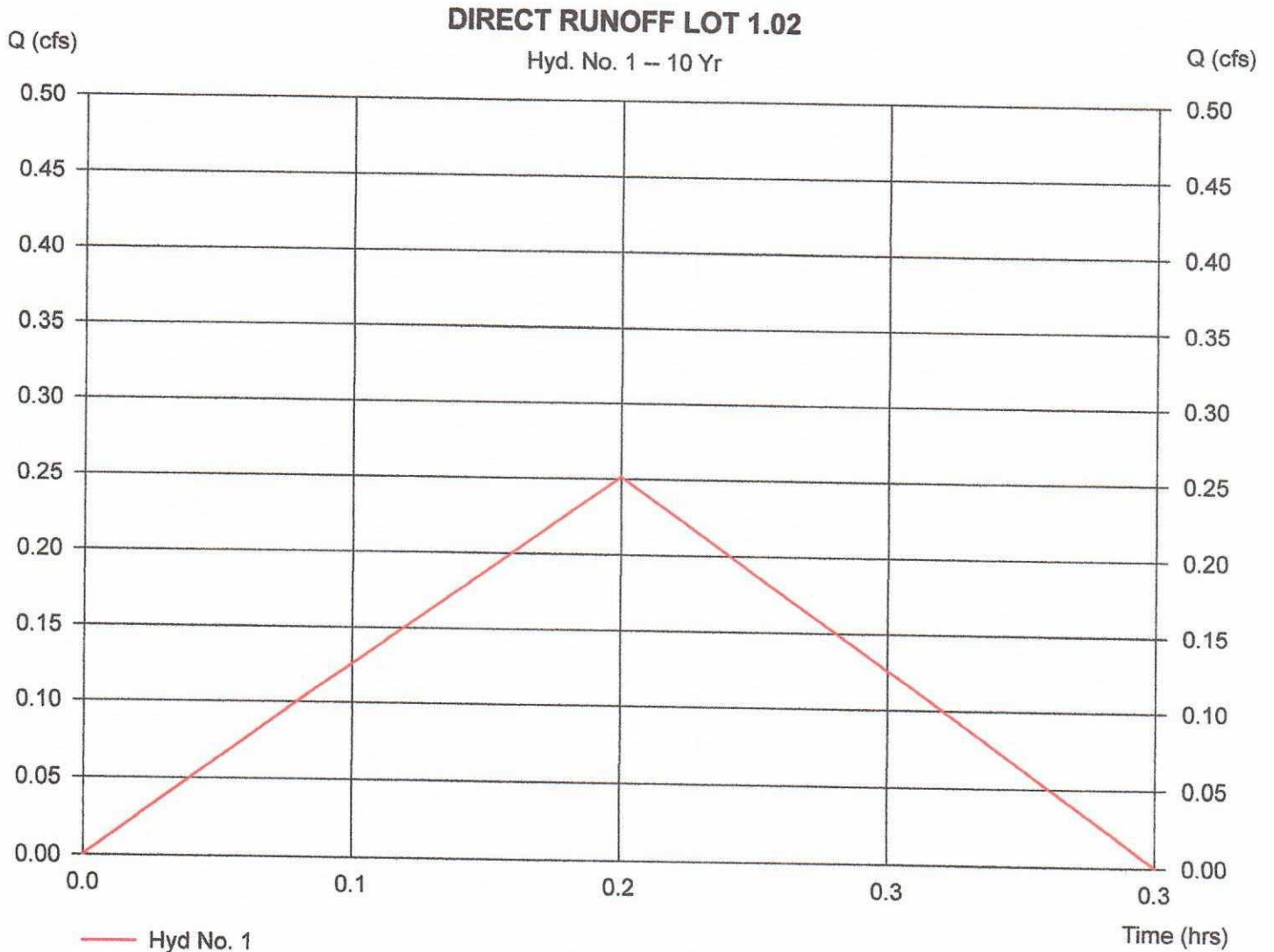
Hyd. No. 1

DIRECT RUNOFF LOT 1.02

Hydrograph type = Rational
Storm frequency = 10 yrs
Drainage area = 0.078 ac
Intensity = 5.139 in/hr
IDF Curve = NOAA, 2019.IDF

Peak discharge = 0.25 cfs
Time interval = 1 min
Runoff coeff. = 0.63
Tc by User = 10.00 min
Asc/Rec limb fact = 1/1

Hydrograph Volume = 151 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Mar 1 2021, 8:9 AM

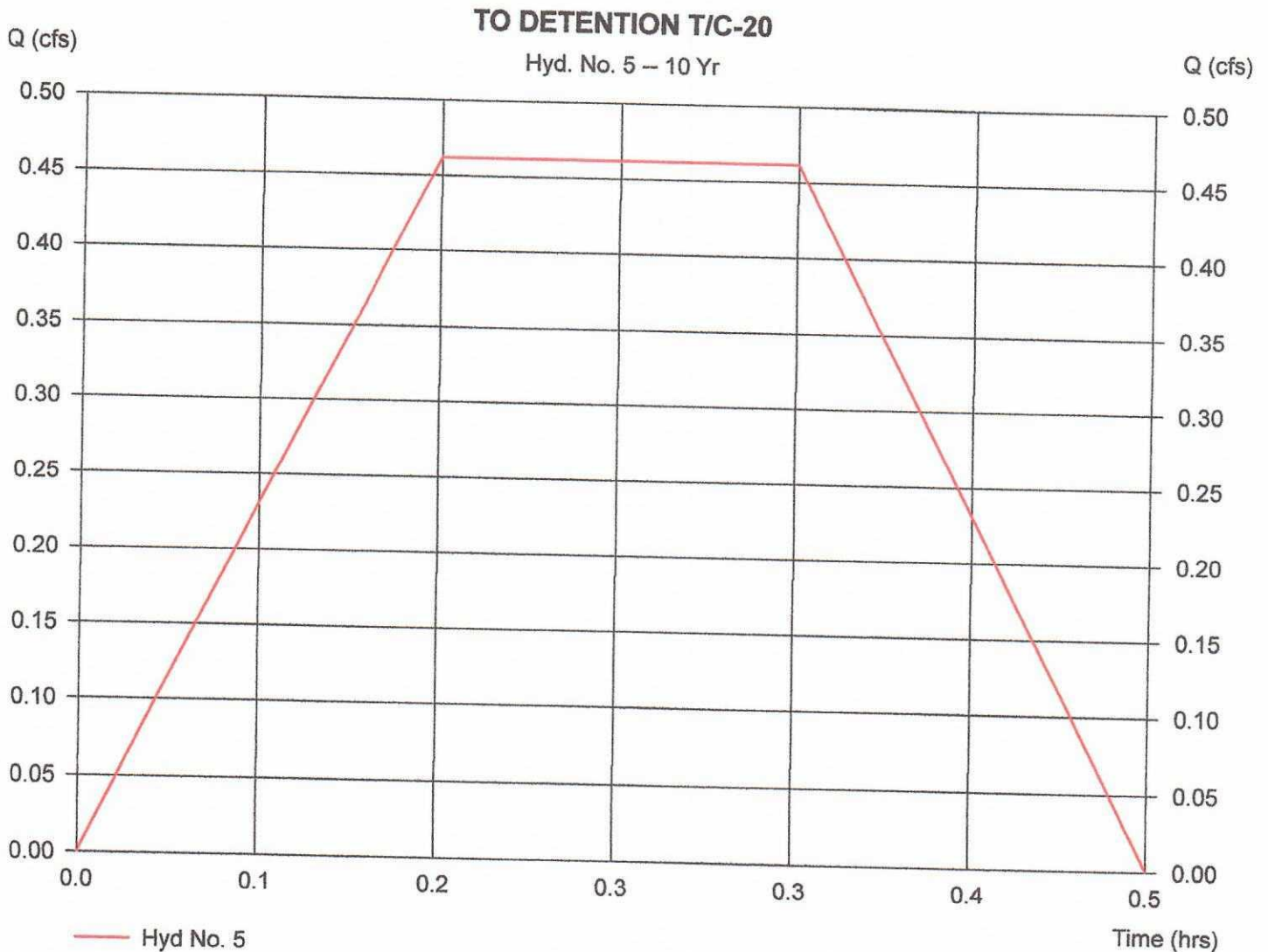
Hyd. No. 5

TO DETENTION T/C-20

Hydrograph type = Mod. Rational
Storm frequency = 10 yrs
Drainage area = 0.157 ac
Intensity = 3.824 in/hr
IDF Curve = NOAA, 2019.IDF

Peak discharge = 0.46 cfs
Time interval = 1 min
Runoff coeff. = 0.77
Tc by User = 10.00 min
Storm duration = 2 x Tc

Hydrograph Volume = 554 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Mar 1 2021, 8:9 AM

Hyd. No. 6

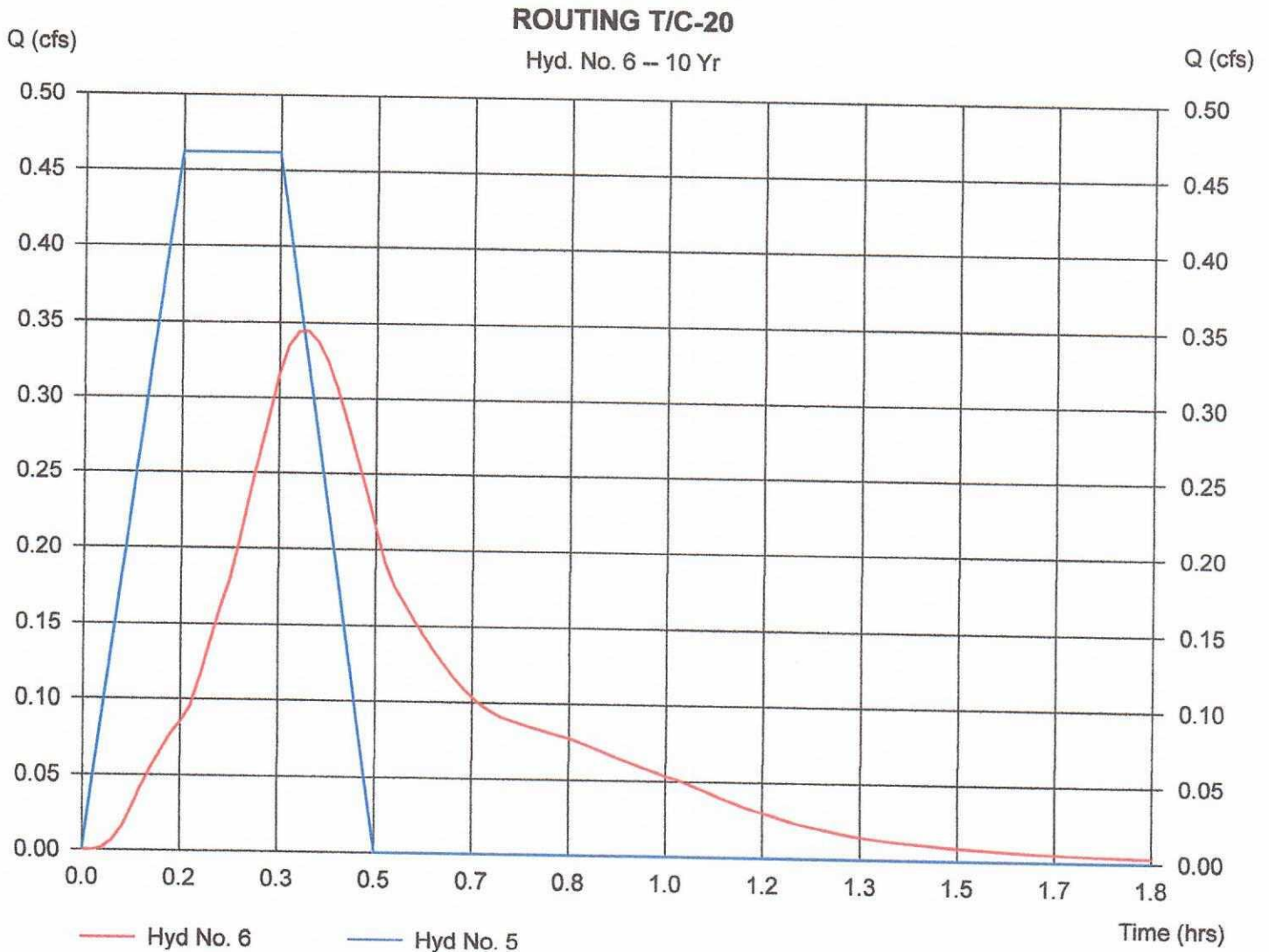
ROUTING T/C-20

Hydrograph type = Reservoir
Storm frequency = 10 yrs
Inflow hyd. No. = 5
Reservoir name = New Pond1 POND LOT 1.02

Peak discharge = 0.34 cfs
Time interval = 1 min
Max. Elevation = 97.82 ft
Max. Storage = 293 cuft

Storage Indication method used.

Hydrograph Volume = 549 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Mar 1 2021, 8:9 AM

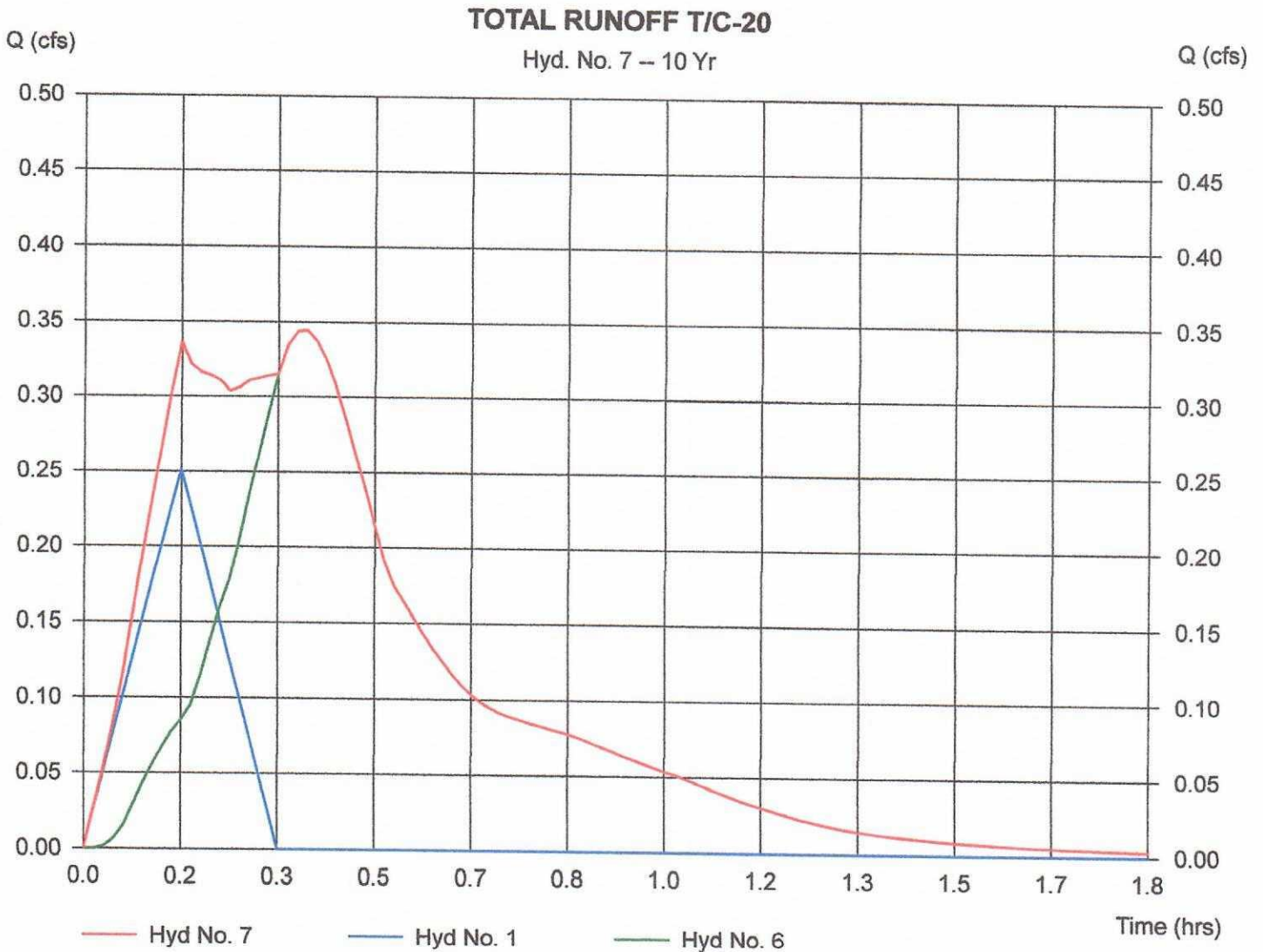
Hyd. No. 7

TOTAL RUNOFF T/C-20

Hydrograph type = Combine
Storm frequency = 10 yrs
Inflow hyds. = 1, 6

Peak discharge = 0.34 cfs
Time interval = 1 min

Hydrograph Volume = 700 cuft



Hydrograph Summary Report

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Volume (cuft) | Inflow hyd(s) | Maximum elevation (ft) | Maximum storage (cuft) | Hydrograph description | |
|------------------------------|--------------------------|-----------------|---------------------|--------------------|-------------------------|---------------|------------------------------|------------------------|----------------------------|--|
| 1 | Rational | 0.40 | 1 | 10 | 242 | — | — | — | DIRECT RUNOFF LOT 1.01 | |
| 2 | Rational | 0.98 | 1 | 10 | 590 | — | — | — | RUNOFF TO DETENTION T/C-10 | |
| 3 | Reservoir | 0.49 | 1 | 15 | 585 | 2 | 97.97 | 350 | ROUTING T/C-10 | |
| 4 | Combine | 0.75 | 1 | 13 | 828 | 1, 3 | — | — | ROUTING T/C-20 | |
| 5 | Mod. Rational | 0.75 | 1 | 10 | 897 | — | — | — | TO DETENTION T/C-20 | |
| 6 | Reservoir | 0.61 | 1 | 22 | 892 | 5 | 98.13 | 404 | ROUTING T/C-20 | |
| 7 | Combine | 0.65 | 1 | 15 | 1,134 | 1, 6 | — | — | TOTAL RUNOFF T/C-20 | |
| 8 | Mod. Rational | 0.62 | 1 | 10 | 1,109 | — | — | — | TO DETENTION T/C-30 | |
| 9 | Reservoir | 0.58 | 1 | 31 | 1,104 | 8 | 98.09 | 390 | ROUTING T/C-30 | |
| PROPOSED 100 YR-LOT 1.02.gpw | | | | | Return Period: 100 Year | | Monday, Mar 1 2021, 12:07 PM | | | |

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Mar 1 2021, 12:7 PM

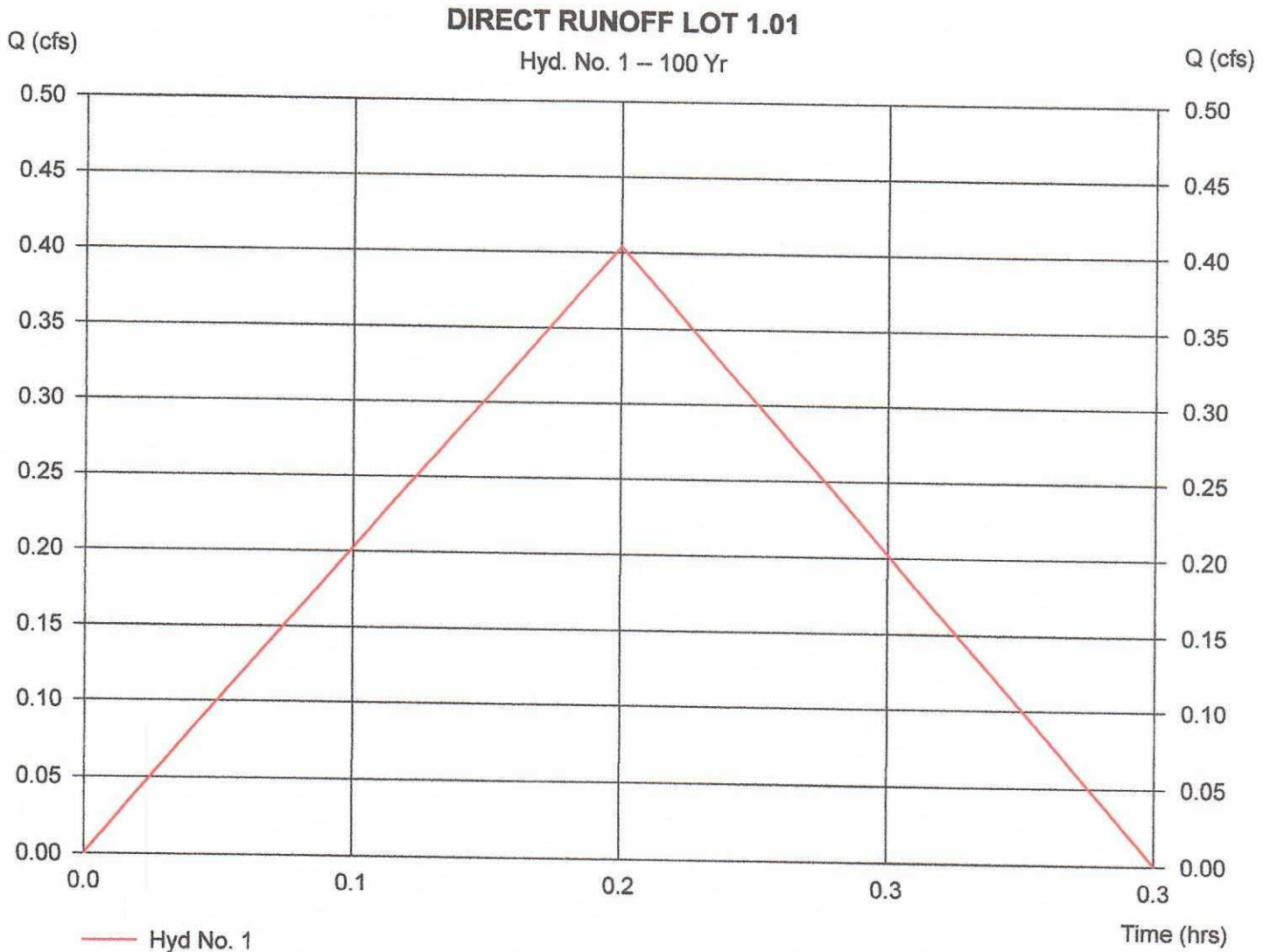
Hyd. No. 1

DIRECT RUNOFF LOT 1.01

Hydrograph type = Rational
Storm frequency = 100 yrs
Drainage area = 0.078 ac
Intensity = 6.674 in/hr
IDF Curve = NOAA, 2019.IDF

Peak discharge = 0.40 cfs
Time interval = 1 min
Runoff coeff. = 0.78
Tc by User = 10.00 min
Asc/Rec limb fact = 1/1

Hydrograph Volume = 242 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Mar 1 2021, 12:7 PM

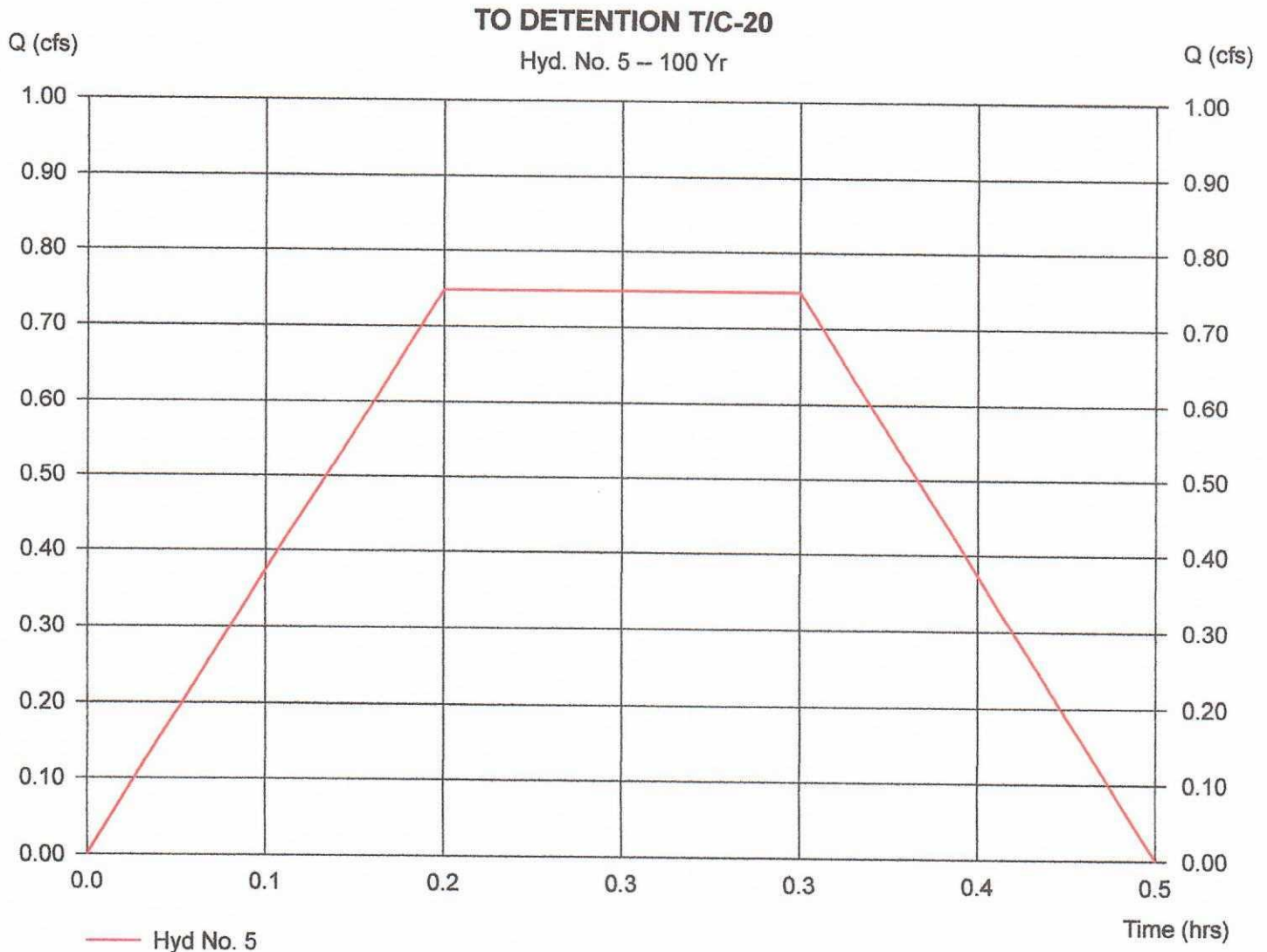
Hyd. No. 5

TO DETENTION T/C-20

Hydrograph type = Mod. Rational
Storm frequency = 100 yrs
Drainage area = 0.157 ac
Intensity = 5.070 in/hr
IDF Curve = NOAA, 2019.IDF

Peak discharge = 0.75 cfs
Time interval = 1 min
Runoff coeff. = 0.94
Tc by User = 10.00 min
Storm duration = 2 x Tc

Hydrograph Volume = 897 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Mar 1 2021, 12:7 PM

Hyd. No. 6

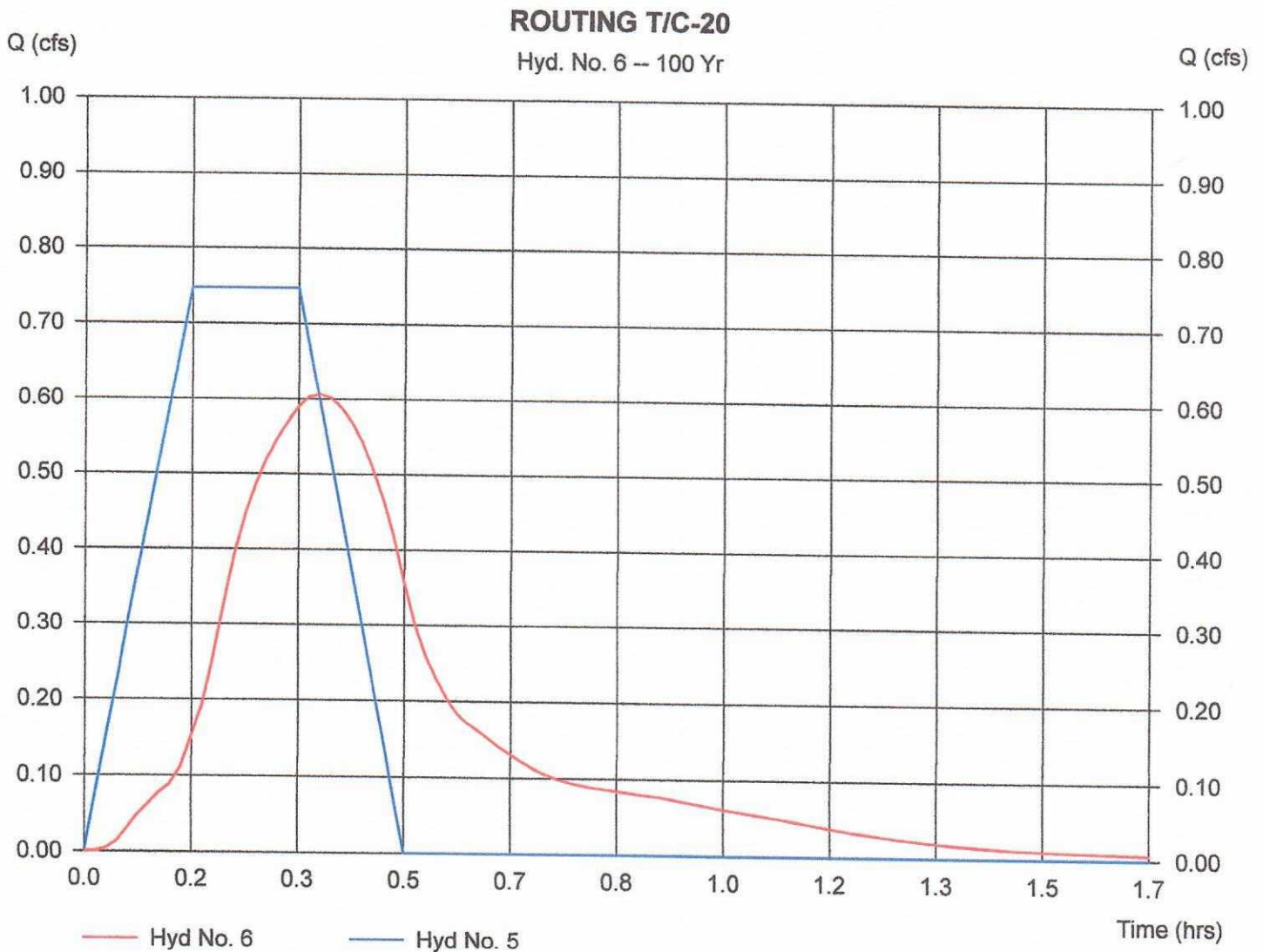
ROUTING T/C-20

Hydrograph type = Reservoir
Storm frequency = 100 yrs
Inflow hyd. No. = 5
Reservoir name = POND LOT 1.02

Peak discharge = 0.61 cfs
Time interval = 1 min
Max. Elevation = 98.13 ft
Max. Storage = 404 cuft

Storage Indication method used.

Hydrograph Volume = 892 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Mar 1 2021, 12:7 PM

Hyd. No. 7

TOTAL RUNOFF T/C-20

Hydrograph type = Combine
Storm frequency = 100 yrs
Inflow hyds. = 1, 6

Peak discharge = 0.65 cfs
Time interval = 1 min

Hydrograph Volume = 1,134 cuft

