



TRANSMITTAL

| | |
|---|---|
| TO: Vicky Huang COMPANY: City of Wichita ADDRESS: 7 th Floor City Hall CITY/ STATE: Wichita, Kansas | FROM: Trevor Kurth DATE: 3-6-07 PROJECT: Westway 2 nd Addition PROJECT NUMBER: |
|---|---|

RE:
Westway 2nd Addition Drainage Plan

VIA: DELIVERY

We are sending you: ATTACHED UNDER SEPARATE COVER
 PLANS PRINTS SHOP DRAWINGS SAMPLES SPECS
 COPY OF LETTER CHANGE ORDER DISK OTHER

| COPIES | DATE | DESCRIPTION |
|--------|--------|--|
| 1 | 3-6-07 | Westway 2 nd Addition Drainage Plan |
| | | |
| | | |
| | | |

URGENT FOR APPROVAL FOR YOUR INFO FOR REVIEW & COMMENT
 APPROVED, AS NOTED REVISE AS NOTED REVISE AND RETURN
 AS REQUESTED PLEASE REPLY FOR BIDS DUE

NOTES/ COMMENTS:

SIGNED: 
 Trevor R. Kurth, I.E.

Copy: file

ENGINEERING
 SURVEYING
 PLANNING
 LANDSCAPE
 ARCHITECTURE

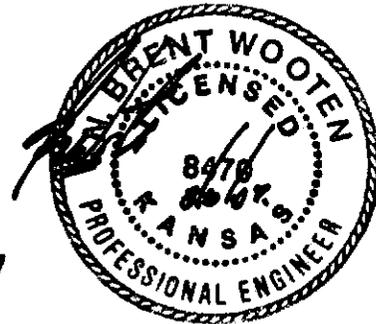
B a u g h m a n
 Company, P.A.
 315 Ellis Street
 Wichita, Kansas 67203
 P 316.262.7271
 F 316.262.0149

DRAINAGE PLAN
WESTWAY 2ND
ADDITION
TO
WICHITA, SEDGWICK COUNTY, KANSAS

PREPARED BY



05 MARCH 2007





DRAINAGE PLAN WESTWAY 2nd ADDITION

FINAL REPORT

**Prepared by Baughman Company, P.A.
05 March 2007**

**By N. Brent Wooten, P.E.
Trevor R. Kurth, I.E.
Nicholas H. Jefferson, I.E.**



**Public Works, Engineering Division
Final Drainage Plan Submittal Checklist**

Reviewer: _____ Date: _____
 Subdivision Name: WESTWAY 2ND ADDITION Location: PALWEE & SENECA ST.
 Total Land Area Of Ownership: ± 42 Acres
 Type: _____ Residential Commercial _____ Industrial _____ Recreation _____ Municipal _____ Other _____
 Applicant: _____ Contact: _____ Phone #: _____
 Engineer: BAUGHMAN CO., PA Contact: TREVOR KUETH Phone # 262-7271

Please check the appropriate box:

I = Included; NA = Non-Applicable; R= Required prior to development
 (If "NA" is checked, an explanation must be entered)

| Tab 1. Project Narrative | Applicant | | Explanation / Location in Plan | Engr | |
|--|-------------------------------------|-------------------------------------|--|------|----|
| | I | NA | | I | NA |
| A. Site Location Map, using USGS Map | <input checked="" type="checkbox"/> | | | | |
| B. Discussion of development, existing conditions, and proposed impacts on stormwater, wetland, riparian, and flood plain | <input checked="" type="checkbox"/> | | | | |
| C. Discussion of offsite conditions | <input checked="" type="checkbox"/> | | | | |
| D. Summary of runoff calculations (pre/post development) No increase in peak discharge for all storm series | <input checked="" type="checkbox"/> | | | | |
| E. Narrative description of the type and function of the permanent best management practices that are incorporated into the site design | <input checked="" type="checkbox"/> | | | | |
| F. Copy of the plat | <input checked="" type="checkbox"/> | | | | |
| G. Preliminary grading plan (The final grading plan shall be sealed, signed and dated prior to Engineering receiving the final sanitary sewer plans. One plan sheet and PDF shall be submitted to the Subdivision Engineer.) | | <input checked="" type="checkbox"/> | NO GRADING PLAN INCLUDED; NO GRADE CHANGES PROPOSED | | |
| H. Professional Engineer seal, signature and date on cover of report | <input checked="" type="checkbox"/> | | | | |
| I. CD of drainage plan in PDF format (one file) and one paper copy bound with this checklist included behind the cover | | <input checked="" type="checkbox"/> | UPON APPROVAL, CD WILL BE MADE | | |

| Tab 2. Existing Conditions Runoff Calculations | Applicant | | Explanation / Location in Plan | Engr | |
|---|-------------------------------------|-------------------------------------|--------------------------------|------|----|
| | I | NA | | I | NA |
| A. Copy of applicable orthophoto showing proposed project boundaries (preferable in color) | <input checked="" type="checkbox"/> | | | | |
| B. Runoff Method (Rational, Hydrograph Method, or other approved methods by Engineering) | <input checked="" type="checkbox"/> | | | | |
| C. Existing topography (no greater than 2-foot contours, 1-foot recommend) | <input checked="" type="checkbox"/> | | | | |
| D. Total Site Area and Total Impervious Area (acres) | <input checked="" type="checkbox"/> | | | | |
| E. Benchmarks used for site control | <input checked="" type="checkbox"/> | | | | |
| F. Streams, creeks, and waterway labeled | | <input checked="" type="checkbox"/> | NONE PRESENT | | |
| G. Predominant soils from USDA soil surveys, and/or on site soil borings | <input checked="" type="checkbox"/> | | | | |
| H. Location and boundaries of natural features such as wetlands, lakes, and ponds with the normal water elevation noted | <input checked="" type="checkbox"/> | | | | |
| I. Location of existing roads, buildings, parking lots and other impervious areas. | <input checked="" type="checkbox"/> | | | | |



| | | | | | |
|---|---|---|----------------|--|--|
| J. Location of existing utilities (e.g., water, sewer, gas, electric) and easements | X | | | | |
| K. Location of existing conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow | X | | | | |
| L. Flow paths | X | | | | |
| M. Location and dimensions of existing channels, bridges or culvert crossings | X | | | | |
| N. Existing conditions hydrologic analysis for runoff rates, volumes and velocities showing methodologies used and supporting calculations (2, 5, 10, 25 & 100 year, 24-hour storm events) or Critical Duration | X | | | | |
| O. Assumed pre-developed runoff curve numbers | X | | | | |
| P. Existing time of concentrations used in calculations | X | | | | |
| Q. Evaluate immediate downstream drainage capacity, not to exceed more than 0.25 miles downstream of site | X | | | | |
| R. Existing structural elevations (e.g., invert of pipes, manholes, etc.) | X | | | | |
| S. Cross-section data for open channels | | X | NONE ON SITE | | |
| T. Ground water elevations, if applicable | | X | NOT APPLICABLE | | |

| Tab 3. Post-Development Hydrologic Analysis | Applicant | | | Engr | |
|--|-----------|----|--|------|----|
| | I | NA | Explanation / Location in Plan | I | NA |
| A. Proposed (post-development) conditions hydrologic and hydraulic analysis for runoff rates, volumes, HGL, and velocities showing the methodologies used and supporting calculations for all applicable design storms (2, 5, 10, 25 & 100 year, 24-hour storm events) | | X | POST-DEVELOPMENT CONDITIONS EQUALS PRE-DEVELOPMENT | | |
| B. Proposed time of concentrations used in calculations | | | | | |
| C. Assumed post-developed runoff curve numbers | | | | | |
| D. Proposed contours for detention facilities (to equal area used in outlet rating curves) | | | | | |
| E. Preliminary sizing calculations for stormwater controls including contributing drainage area, storage, and outlet configuration | | | | | |
| F. Stage-storage-discharge or outlet rating curves and inflow and outflow hydrographs for storage facilities | | | | | |
| G. Final analysis of potential upstream/downstream impact/effects of project, where necessary | | | | | |
| H. Existing and proposed structural elevations (e.g., invert of pipes, manholes, etc.) | | | | | |
| I. Design water surface elevations and normal pool elevation for ponds. | | | | | |
| J. Typical detail for outlet structures, embankments, spillways, grade control structures, conveyance channels, etc. To include height, width, elevation, and/or diameter. | | | | | |
| K. Proposed limits of clearing and grading | | | | | |
| L. Location of existing and proposed roads, buildings, parking lots and other impervious areas. | | | | | |
| M. Location of existing and proposed utilities (e.g., water, sewer) and easements | | | | | |
| N. Location of existing and proposed conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow | | | | | |
| O. Preliminary location and dimensions of proposed channel modifications, such as bridge or culvert crossings | | X | | | |



| | | | | | |
|---|--|---|-------------------------|--|--|
| P. Preliminary selection and location of stormwater controls | | X | POST-DEV EQUALS PRE-DEV | | |
| Q. Emergency overflow structure's flow path | | | | | |
| R. Detention facility provides one-foot of freeboard above the HWL and emergency outfall shown (top of berm elevation shown) | | | | | |
| S. The 100-year 24-hour HWL delineated on the plan for detention pond | | | | | |
| T. Lowest opening elevations table on the plat for structures located adjacent to channels or ponds | | | | | |
| U. Stormwater Management Facilities located within a Reserve | | | | | |
| V. Maintenance responsibility of stormwater management facility shall be specified in the platters text. (e.g. HOA, Lot Owners Association, or lot) | | | | | |
| W. Off-site drainage easements or agreements required, where necessary | | | | | |

| Tab 4. Floodplain Submittal | Applicant | | | Engr | |
|---|-----------|----|--------------------------------|------|----|
| | I | NA | Explanation / Location in Plan | I | NA |
| A. Provide source of flood profile | | X | NO FLOODPLAIN LOCATED ON-SITE | | |
| B. Nearest base flood elevations | | | | | |
| C. Delineation of pre-developed regulatory floodplain/floodway limits | | | | | |
| D. Delineation of post-developed regulatory floodplain and floodway limits | | | | | |
| E. Floodplain boundary determination per elevation (project limits shown) | | | | | |
| F. Provide source of floodway data table and discharges | | | | | |
| G. Provide all hydrologic and hydraulic study information for site-specific floodplain studies, unnumbered Zone A area elevation determinations and flood plain map revisions or required permits | | | | | |
| H. Provide regulatory floodway and four natural profile models (10,50,100, and 500-yr) for existing and future watershed conditions | | | | | |
| I. Location of floodplain/floodway limits and relationship of site to upstream/downstream properties (floodplain limits to be per elevation and scaled location) | | | | | |
| J. Flood plains and floodways located within a Reserve, where necessary | | | | | |

| Tab 5. Federal, State and Local Permits (to be provided prior to construction unless otherwise specified) | Applicant | | | Engr | |
|--|-----------|----|--------------------------------|------|----|
| | I/R | NA | Explanation / Location in Plan | I/R | NA |
| A. US Army Corps of Engineers - Regulatory program permits (404 water quality certification) | | X | NONE EXPECTED | | |
| B. Kansas Department of Agriculture - Division of Water Resources Permits (Stream Obstruction, Channel Change, Flood Plain Fill, Levee, Water Appropriations, Dam safety permit, etc.) | | X | | | |
| C. Federal Emergency Management Agency (FEMA) Letter of Map Changes (LOMA, LOMR, LOMR-f, CLOMR, etc.) Shall be included and approved when project modifies the limits of the floodway. | | X | | | |
| D. Kansas Department of Transportation | | X | | | |
| E. Sedgwick County Right-of-way Permit | | X | | | |

REPORT CONTENTS

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- Proposed Conditions
- Offsite Conditions
- Exhibit 1: Site Location Map
- Exhibit 2: Plat -- Half Scale

Existing Conditions Runoff Calculations

- Drainage Methods & Standards
- Site Characteristics
- Existing Conditions Hydrologic Analysis
- Downstream Drainage Capacity
- Exhibit 3: Aerial Photo Exhibit with Topography

Post-Development Hydrologic Analysis

- Proposed Conditions & Improvements
- Exhibit 4: Drainage Plan - Half Scale

Floodplain Submittal

- Source of Floodplain Information
- Exhibit 5: Floodplain Location

Federal, State, & Local Permitting

- US Army Corps of Engineers
- Kansas Dept of Agriculture - DWR Permitting
- FEMA
- Kansas Dept of Transportation
- Sedgwick County ROW

Appendices: Supporting Calculations

- Appendix A: USGS Soils Survey
- Appendix B: HydraFlow Hydrographs

Plan Sheets

- Drainage Plan 1:100 Scale

PROJECT NARRATIVE

EXISTING CONDITIONS

The site is located just southwest of the intersection of Pawnee and Seneca St. The existing area consists of approximately 42 acres and is currently developed into commercial property with associated paved parking and utilities. The majority of the site is drained by an existing storm water sewer system that connects into a 72" pipe under Pawnee Avenue. This storm sewer system extends to the east and directly discharges into the Arkansas River. There is an existing pond on the west side of the site that drains 7.4 acres. This area consists of a commercial building and approximately 3.9 acres of paved parking.

PROPOSED CONDITIONS

There are no proposed changes for the site upon development. Therefore proposed hydrologic conditions should equal existing hydrologic conditions.

OFFSITE CONDITIONS

There does not appear to be any offsite flow encroaching the property. The development is bounded on the south and west by residential subdivisions and on the north and east by other commercial properties. The entire surrounding area has been previously developed.

EXISTING CONDITIONS RUNOFF CALCULATIONS

DRAINAGE METHODS & STANDARDS

The following methods and standards, although not a complete list, were used in calculating the existing conditions runoff values.

- **STORM SERIES**
 - 24-hour; 2-yr, 5-yr, 10-yr, 25-yr, 100-yr Storm Events Modeled
 - 2-yr Rainfall Depth = 3.5 in
 - 5-yr Rainfall Depth = 4.5 in
 - 10-yr Rainfall Depth = 5.3 in
 - 25-yr Rainfall Depth = 6.1 in
 - 100-yr Rainfall Depth = 7.8 in

- **OFFSITE FLOW**
 - Areas per existing topography and site visits
 - HydraFlow Hydrographs software for existing flows (SCS Unit Hydrograph Method)
 - Time of Concentration using City of Wichita minimum 15 min

SITE CHARACTERISTICS

The proposed 42 acre site is currently developed into commercial areas. There is an existing pond in the southwest corner of the site which serves only the adjoining parking lot. The site is bordered by residential areas on the south and west sides, and commercial areas on the north and east sides. As stated earlier, the site is currently developed with paved parking and a commercial strip center.

EXISTING CONDITIONS HYDROLOGIC ANALYSIS

Currently there are three main drainage areas within the site. The largest part of the site, approximately 19 acres, drains into a stormwater sewer system. A 7.4 acre paved area drains into an existing detention pond in the southwest corner of the site. The remainder of the site appears to flow offsite onto the adjacent streets.

- **Storm Water Sewer System** - Currently 19 acres of the site is drained by an existing storm sewer system under Pawnee Avenue. The on-site system, according to City of Wichita records, drains into a 72" SWS line that runs east under Pawnee Avenue and directly discharges into the Arkansas River.

- **Detention Pond Area** - There is a pond in the southwest corner of the site that detains approximately 7.4 acres of developed runoff. This area consists of a commercial building and a large paved parking lot. This area produces runoff at a rate of 10 cfs for a 2-year storm, 16 cfs for a 10-year storm, and 24 cfs for a 100-year storm. The pond has an area inlet located in the east end of the pond. Based on site visits, this inlet appears to be the primary outlet for the pond. However, at the time of our field visit the inlet appeared to be plugged, and was submerged in approximately 1-2' of water. Due to the inlet being submerged, it is unknown where this inlet drains. Based on elevation difference, the inlet does not appear to drain east and into the site's existing stormwater sewer system. Since the inlet was submerged and

did not appear to be functioning properly, the pond was modeled assuming no primary outlet. This assumption gave the pond a water surface elevation of 1285.1 for a 2-year event, 1286.1 for a 10-year event, and 1286.7 for the 100-year event. At this time, it appears that the pond overtops during a 100-year storm event (assuming no outfall). Clearing the outlet pipe of the pond and ascertaining its size would allow for more accurate modeling of the pond and would appear to lower the water surface elevations for all storm events.

- **Drainage Offsite** – The remainder of the proposed development appears to drain offsite onto adjacent streets. This area includes the open grass area on the south side of the site that drains onto Crawford Street, as well as the front side of the lots along Pawnee Avenue and Seneca Street. No modeling was done on any storm systems in either of the aforementioned public streets.

POST-DEVELOPMENT HYDROLOGIC ANALYSIS

PROPOSED CONDITIONS & IMPROVEMENTS

There are currently no proposed changes, to our knowledge at the time of this report, being done on the property. Also, due to the entire site being developed and having mostly impervious area, additional building pad sites are not expected to increase runoff. Therefore pre-development and post-development conditions were considered to be the same for hydrologic analysis.

It is recommended that the existing inlet within the existing pond needs to be cleaned out to allow the pond to drain properly and prevent overtopping.

FLOODPLAIN SUBMITTAL

SOURCE OF FLOODPLAIN INFORMATION

No FEMA SFHA exists on this property. The site is located in FEMA Zone X-shaded. The actual FEMA FIRM Panel can be viewed as Exhibit 6.

Note: The elevations shown on the plan sheets are in NGVD. The elevations on the FEMA FIRM Panels are in NAVD. To convert NAVD to NGVD, subtract 0.4.

FEDERAL, STATE, & LOCAL PERMITTING

US ARMY CORPS OF ENGINEERS

There does not appear to be any US Army Corps of Engineers jurisdiction on this property.

KANSAS DEPT OF AGRICULTURE - DWR PERMITTING

There is not 240+ acres draining onto this site, therefore no DWR permit is expected.

FEMA

No FEMA SFHA exists on this property.

KANSAS DEPT OF TRANSPORTATION

There does not appear to be any KDOT permitting needed on the proposed project.

SEDGWICK COUNTY ROW

There does not appear to be any additional water discharging to the Sedgwick County ROW.

SUPPORTING CALCULATIONS

APPENDIX A: USGS Soils Survey

**APPENDIX B: HydraFlow Hydrograph
- Existing Pond**

USGS Soils Survey

HydraFlow Express

Existing Detention Pond

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.02

| Hyd. No. | Hydrograph type (origin) | Inflow Hyd(s) | Peak Outflow (cfs) | | | | | | | | Hydrograph description |
|----------|--------------------------|---------------|--------------------|-------|-------|-------|-------|-------|-------|--------|------------------------|
| | | | 1-Yr | 2-Yr | 3-Yr | 5-Yr | 10-Yr | 25-Yr | 50-Yr | 100-Yr | |
| 1 | SCS Runoff | ----- | ----- | 9.719 | ----- | 13.14 | 15.52 | 18.23 | 21.61 | 24.29 | WW2nd |
| 2 | Reservoir | 1 | ----- | 0.036 | ----- | 0.000 | 0.042 | 0.000 | 0.000 | 0.045 | <no description> |

Hydrograph Summary Report

Hydraflow Hydrographs by Intellisolve v9.02

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Hyd. volume (acft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (acft) | Hydrograph description | |
|---------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|------------------------|--|
| 1 | SCS Runoff | 9.719 | 2 | 754 | 1.626 | --- | ----- | ----- | WW2nd | |
| 2 | Reservoir | 0.036 | 2 | 1518 | 0.247 | 1 | 1285.14 | 1.59 | <no description> | |
| ExistPond.gpw | | | | | Return Period: 2 Year | | | Monday, Mar 5, 2007 | | |

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

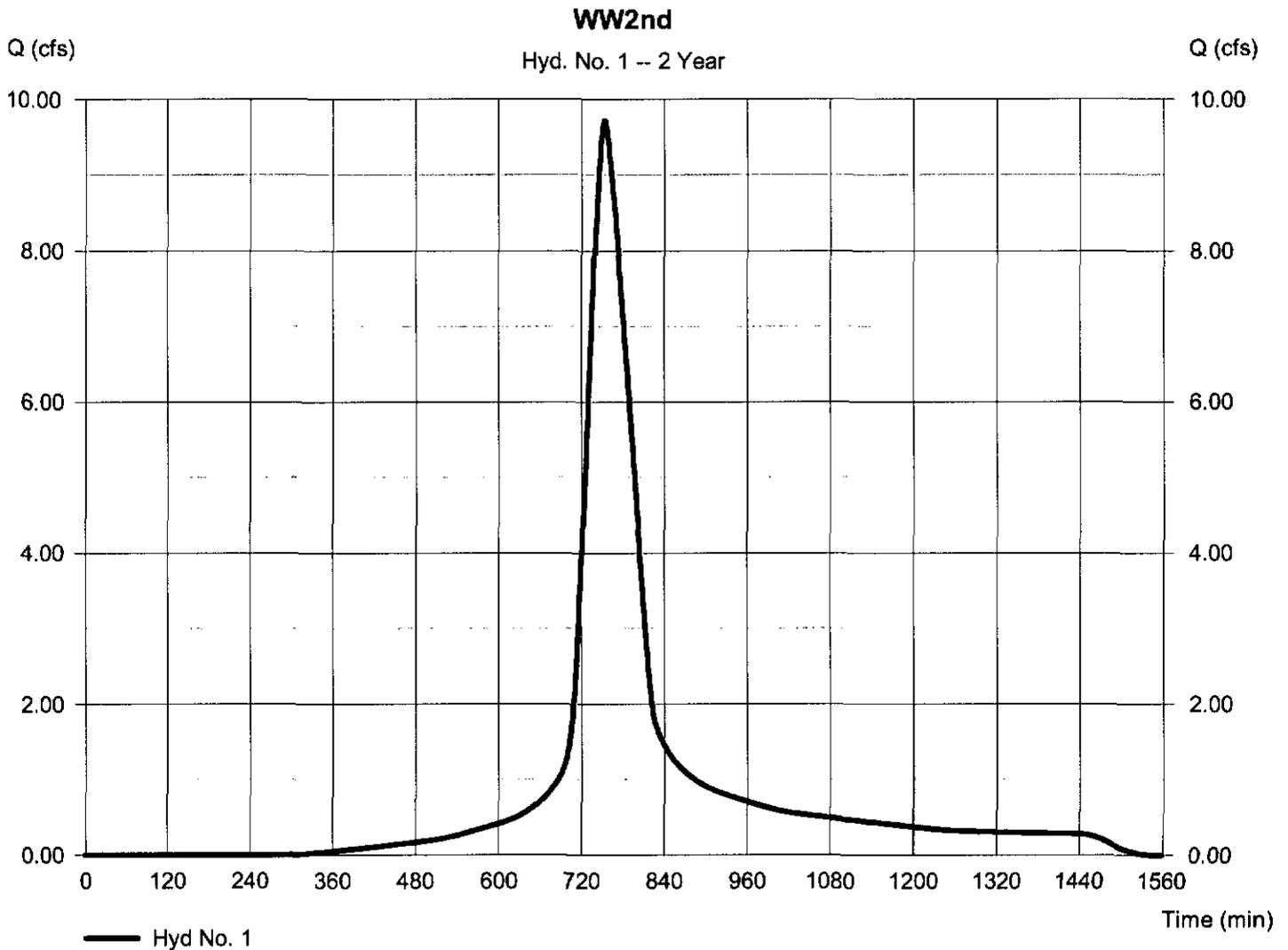
Monday, Mar 5, 2007

Hyd. No. 1

WW2nd

Hydrograph type = SCS Runoff
 Storm frequency = 2 yrs
 Time interval = 2 min
 Drainage area = 7.400 ac
 Basin Slope = 0.0 %
 Tc method = KIRPICH
 Total precip. = 3.50 in
 Storm duration = 24 hrs

Peak discharge = 9.719 cfs
 Time to peak = 754 min
 Hyd. volume = 1.626 acft
 Curve number = 92
 Hydraulic length = 825 ft
 Time of conc. (Tc) = 67.76 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Hyd. volume (acft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (acft) | Hydrograph description | |
|---------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|------------------------|--|
| 1 | SCS Runoff | 13.14 | 2 | 754 | 2.221 | --- | ---- | ---- | WW2nd | |
| 2 | Reservoir | 0.000 | 2 | n/a | 0.000 | 1 | 0.00 | 0.000 | <no description> | |
| ExistPond.gpw | | | | | Return Period: 5 Year | | | Monday, Mar 5, 2007 | | |

Hydrograph Report

Hydraflow Hydrographs by Intelsolve v9.02

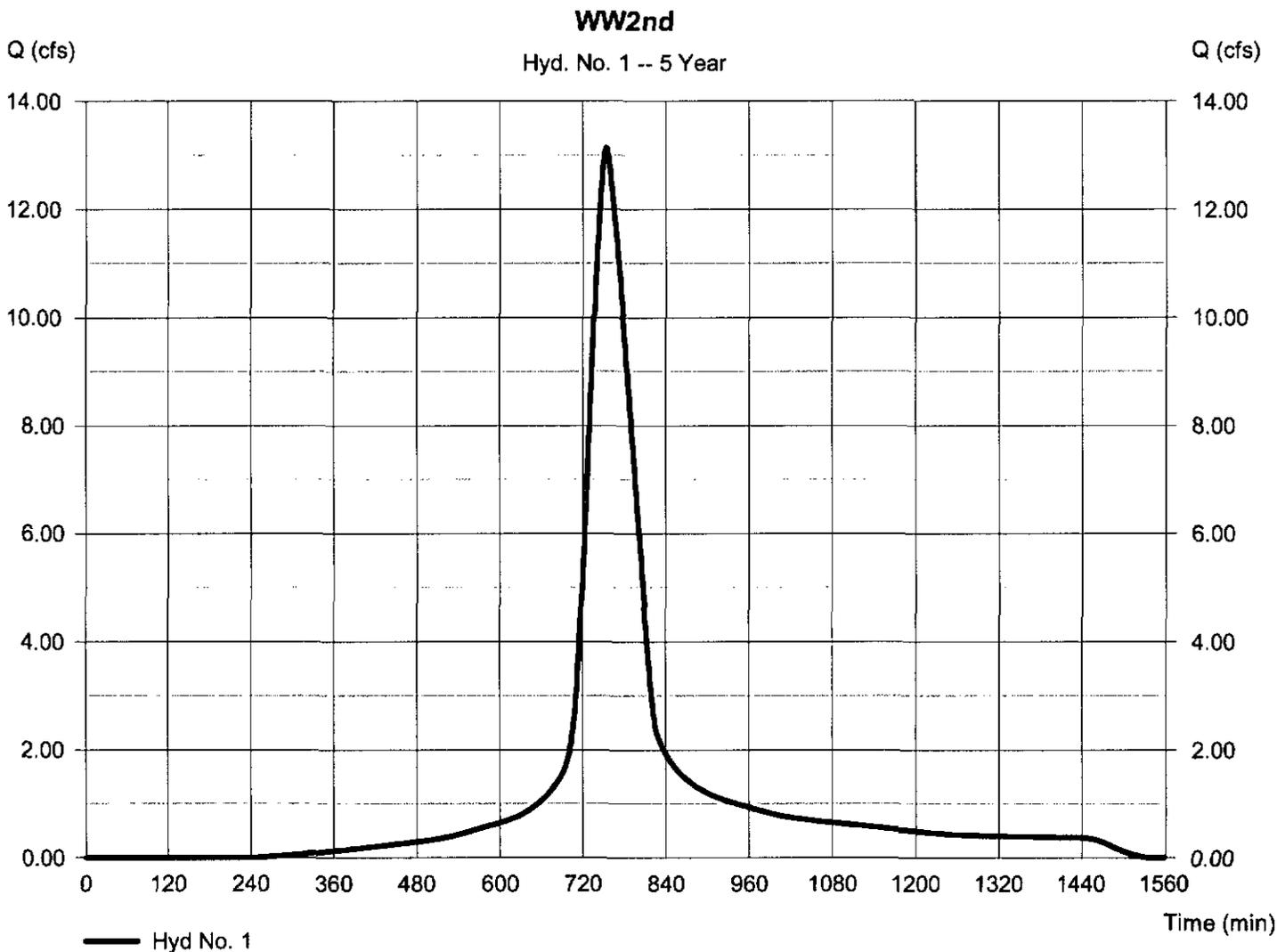
Monday, Mar 5, 2007

Hyd. No. 1

WW2nd

Hydrograph type = SCS Runoff
 Storm frequency = 5 yrs
 Time interval = 2 min
 Drainage area = 7.400 ac
 Basin Slope = 0.0 %
 Tc method = KIRPICH
 Total precip. = 4.50 in
 Storm duration = 24 hrs

Peak discharge = 13.14 cfs
 Time to peak = 754 min
 Hyd. volume = 2.221 acft
 Curve number = 92
 Hydraulic length = 825 ft
 Time of conc. (Tc) = 67.76 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Hyd. volume (acft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (acft) | Hydrograph description |
|---------------|--------------------------|-----------------|---------------------|--------------------|------------------------|---------------|------------------------|-------------------------|------------------------|
| 1 | SCS Runoff | 15.52 | 2 | 754 | 2.642 | --- | ----- | ----- | WW2nd |
| 2 | Reservoir | 0.042 | 2 | 1522 | 0.293 | 1 | 1286.13 | 2.59 | <no description> |
| ExistPond.gpw | | | | | Return Period: 10 Year | | | Monday, Mar 5, 2007 | |

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

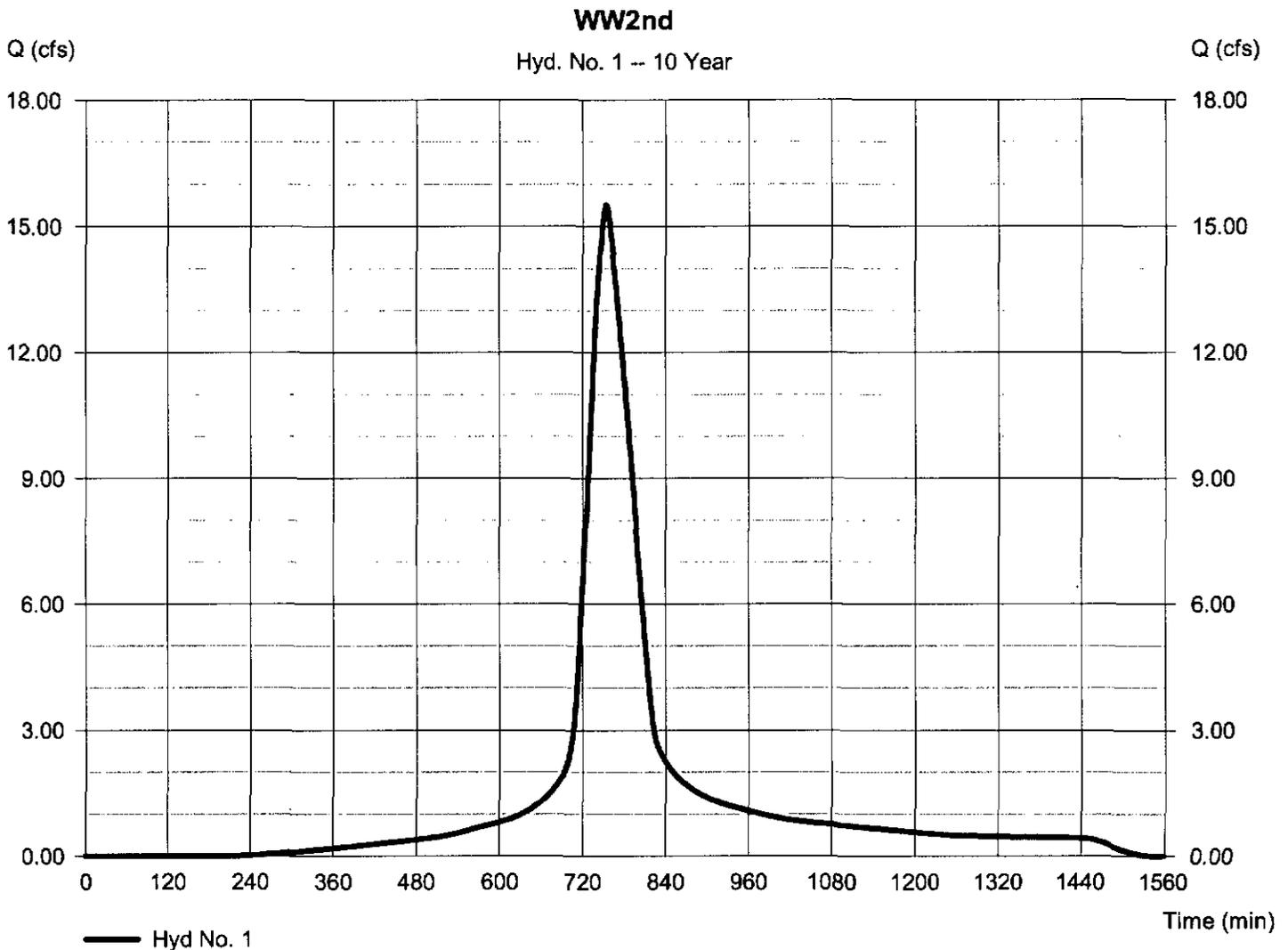
Monday, Mar 5, 2007

Hyd. No. 1

WW2nd

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 2 min
 Drainage area = 7.400 ac
 Basin Slope = 0.0 %
 Tc method = KIRPICH
 Total precip. = 5.20 in
 Storm duration = 24 hrs

Peak discharge = 15.52 cfs
 Time to peak = 754 min
 Hyd. volume = 2.642 acft
 Curve number = 92
 Hydraulic length = 825 ft
 Time of conc. (Tc) = 67.76 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Hyd. volume (acft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (acft) | Hydrograph description | |
|---------------|--------------------------|-----------------|---------------------|--------------------|------------------------|---------------|------------------------|-------------------------|------------------------|--|
| 1 | SCS Runoff | 18.23 | 2 | 754 | 3.126 | --- | ---- | ---- | WW2nd | |
| 2 | Reservoir | 0.000 | 2 | n/a | 0.000 | 1 | 0.00 | 0.000 | <no description> | |
| ExistPond.gpw | | | | | Return Period: 25 Year | | | Monday, Mar 5, 2007 | | |

Hydrograph Report

Hydraflow Hydrographs by Intellisolve v9.02

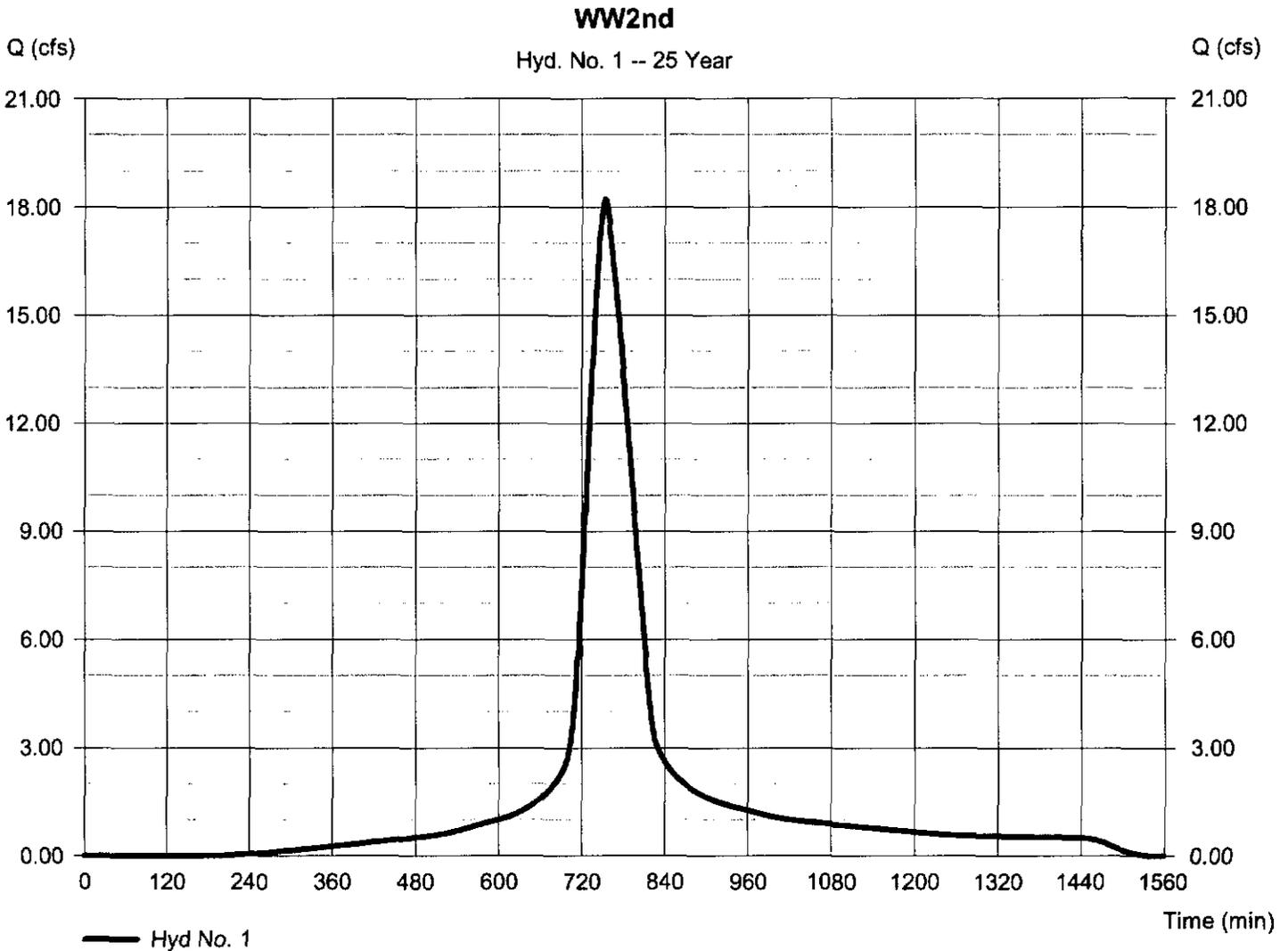
Monday, Mar 5, 2007

Hyd. No. 1

WW2nd

Hydrograph type = SCS Runoff
 Storm frequency = 25 yrs
 Time interval = 2 min
 Drainage area = 7.400 ac
 Basin Slope = 0.0 %
 Tc method = KIRPICH
 Total precip. = 6.00 in
 Storm duration = 24 hrs

Peak discharge = 18.23 cfs
 Time to peak = 754 min
 Hyd. volume = 3.126 acft
 Curve number = 92
 Hydraulic length = 825 ft
 Time of conc. (Tc) = 67.76 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Summary Report

Hydraflow Hydrographs by Intellisolve v9.02

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Hyd. volume (acft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (acft) | Hydrograph description |
|---------------|--------------------------|-----------------|---------------------|--------------------|------------------------|---------------|------------------------|-------------------------|------------------------|
| 1 | SCS Runoff | 21.61 | 2 | 754 | 3.734 | --- | ---- | ---- | WW2nd |
| 2 | Reservoir | 0.000 | 2 | n/a | 0.000 | 1 | 0.00 | 0.000 | <no description> |
| ExistPond.gpw | | | | | Return Period: 50 Year | | | Monday, Mar 5, 2007 | |

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

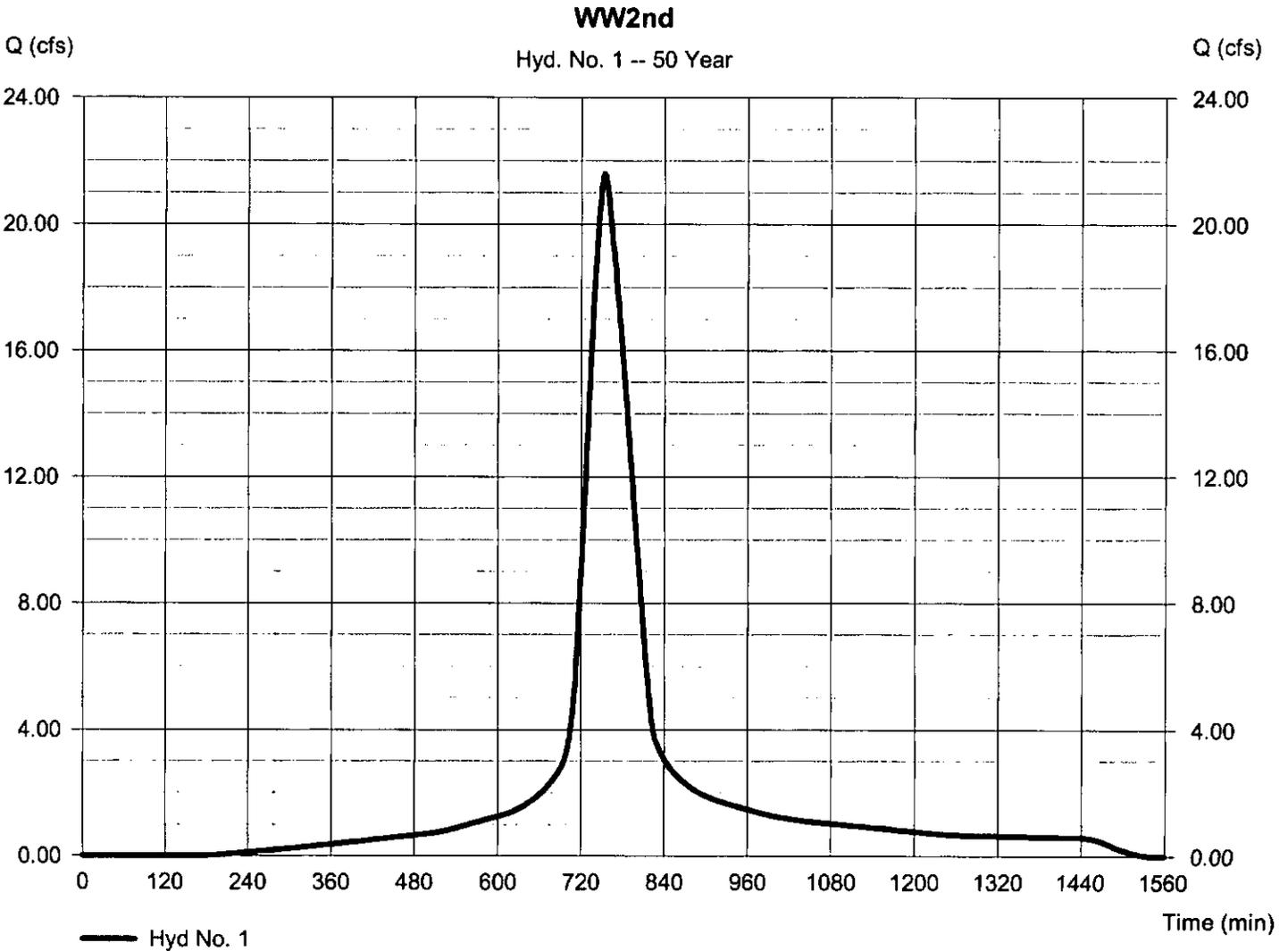
Monday, Mar 5, 2007

Hyd. No. 1

WW2nd

Hydrograph type = SCS Runoff
 Storm frequency = 50 yrs
 Time interval = 2 min
 Drainage area = 7.400 ac
 Basin Slope = 0.0 %
 Tc method = KIRPICH
 Total precip. = 7.00 in
 Storm duration = 24 hrs

Peak discharge = 21.61 cfs
 Time to peak = 754 min
 Hyd. volume = 3.734 acft
 Curve number = 92
 Hydraulic length = 825 ft
 Time of conc. (Tc) = 67.76 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Hyd. volume (acft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (acft) | Hydrograph description |
|---------------|--------------------------|-----------------|---------------------|--------------------|-------------------------|---------------|------------------------|-------------------------|------------------------|
| 1 | SCS Runoff | 24.29 | 2 | 754 | 4.221 | --- | ----- | ----- | WW2nd |
| 2 | Reservoir | 0.045 | 2 | 1528 | 0.318 | 1 | 1286.72 | 4.16 | <no description> |
| ExistPond.gpw | | | | | Return Period: 100 Year | | Monday, Mar 5, 2007 | | |

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

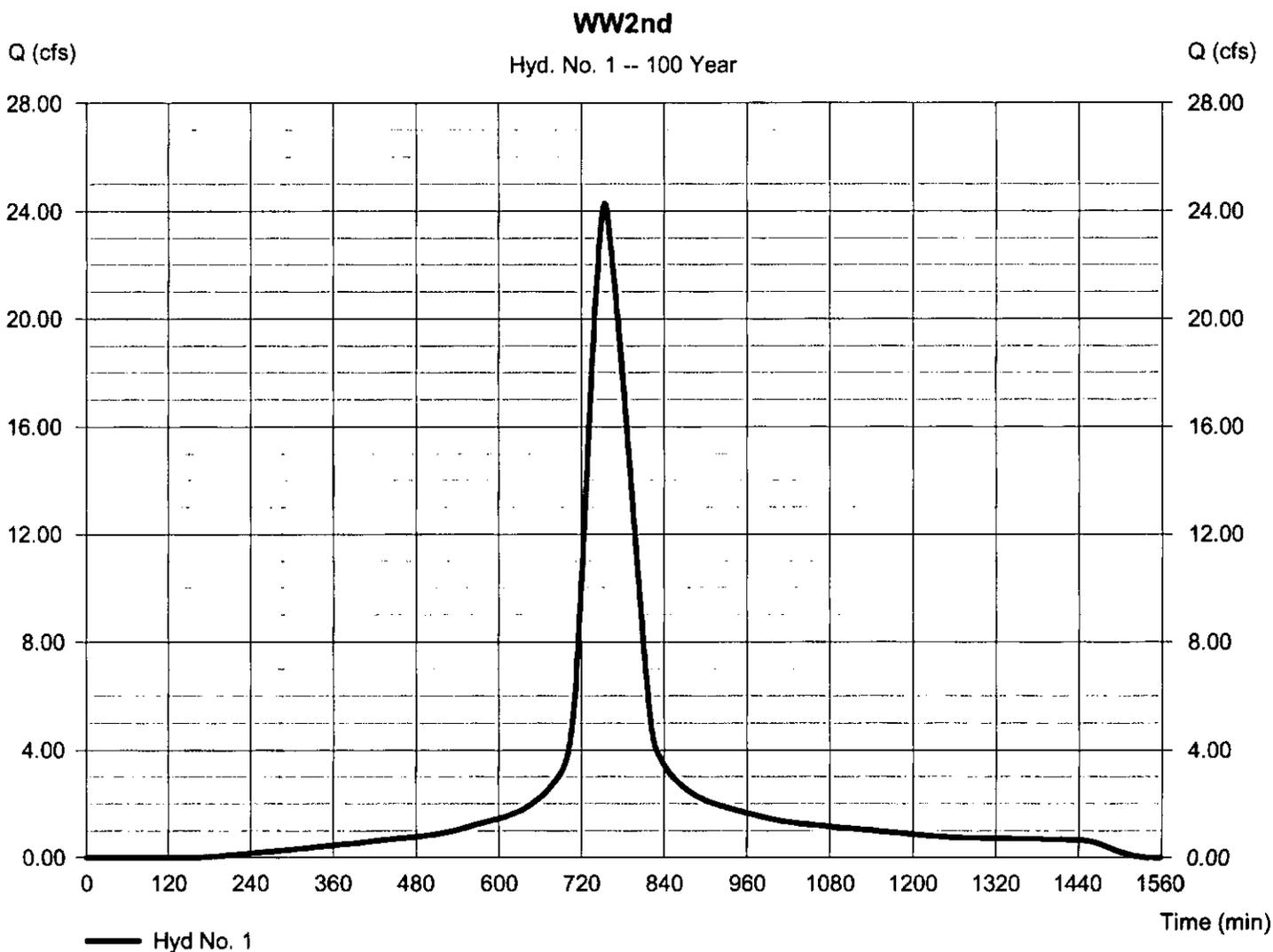
Monday, Mar 5, 2007

Hyd. No. 1

WW2nd

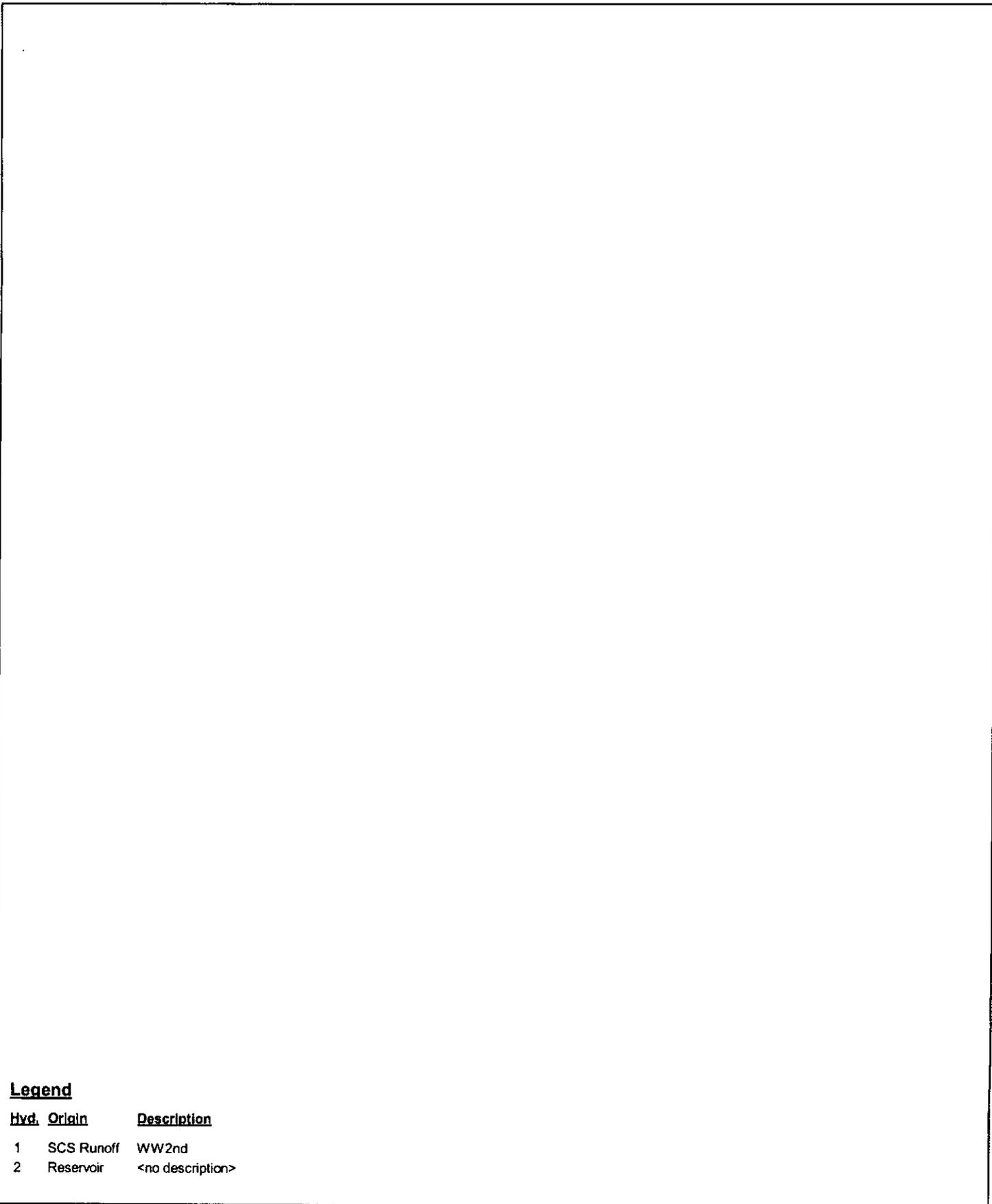
Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 2 min
 Drainage area = 7.400 ac
 Basin Slope = 0.0 %
 Tc method = KIRPICH
 Total precip. = 7.80 in
 Storm duration = 24 hrs

Peak discharge = 24.29 cfs
 Time to peak = 754 min
 Hyd. volume = 4.221 acft
 Curve number = 92
 Hydraulic length = 825 ft
 Time of conc. (Tc) = 67.76 min
 Distribution = Type II
 Shape factor = 484



Watershed Model Schematic

Hydraflow Hydrographs by Intelisolve v9.02



Legend

| <u>Hyd. Orlain</u> | <u>Description</u> |
|--------------------|--------------------|
| 1 SCS Runoff | WW2nd |
| 2 Reservoir | <no description> |



Hydrograph Return Period Recap

Hydraflow Hydrographs by Intellsolve v9.02

| Hyd. No. | Hydrograph type (origin) | Inflow Hyd(s) | Peak Outflow (cfs) | | | | | | | | Hydrograph description |
|----------|--------------------------|---------------|--------------------|-------|-------|-------|-------|-------|-------|--------|------------------------|
| | | | 1-Yr | 2-Yr | 3-Yr | 5-Yr | 10-Yr | 25-Yr | 50-Yr | 100-Yr | |
| 1 | SCS Runoff | ----- | ----- | 9.719 | ----- | 13.14 | 15.52 | 18.23 | 21.61 | 24.29 | WW2nd |
| 2 | Reservoir | 1 | ----- | 0.036 | ----- | 0.041 | 0.042 | 0.043 | 0.044 | 0.045 | <no description> |

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Hyd. volume (acft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (acft) | Hydrograph description | |
|---------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|------------------------|--|
| 1 | SCS Runoff | 9.719 | 2 | 754 | 1.626 | --- | ---- | ---- | WW2nd | |
| 2 | Reservoir | 0.036 | 2 | 1518 | 0.247 | 1 | 1285.14 | 1.59 | <no description> | |
| ExistPond.gpw | | | | | Return Period: 2 Year | | | Monday, Mar 5, 2007 | | |

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Monday, Mar 5, 2007

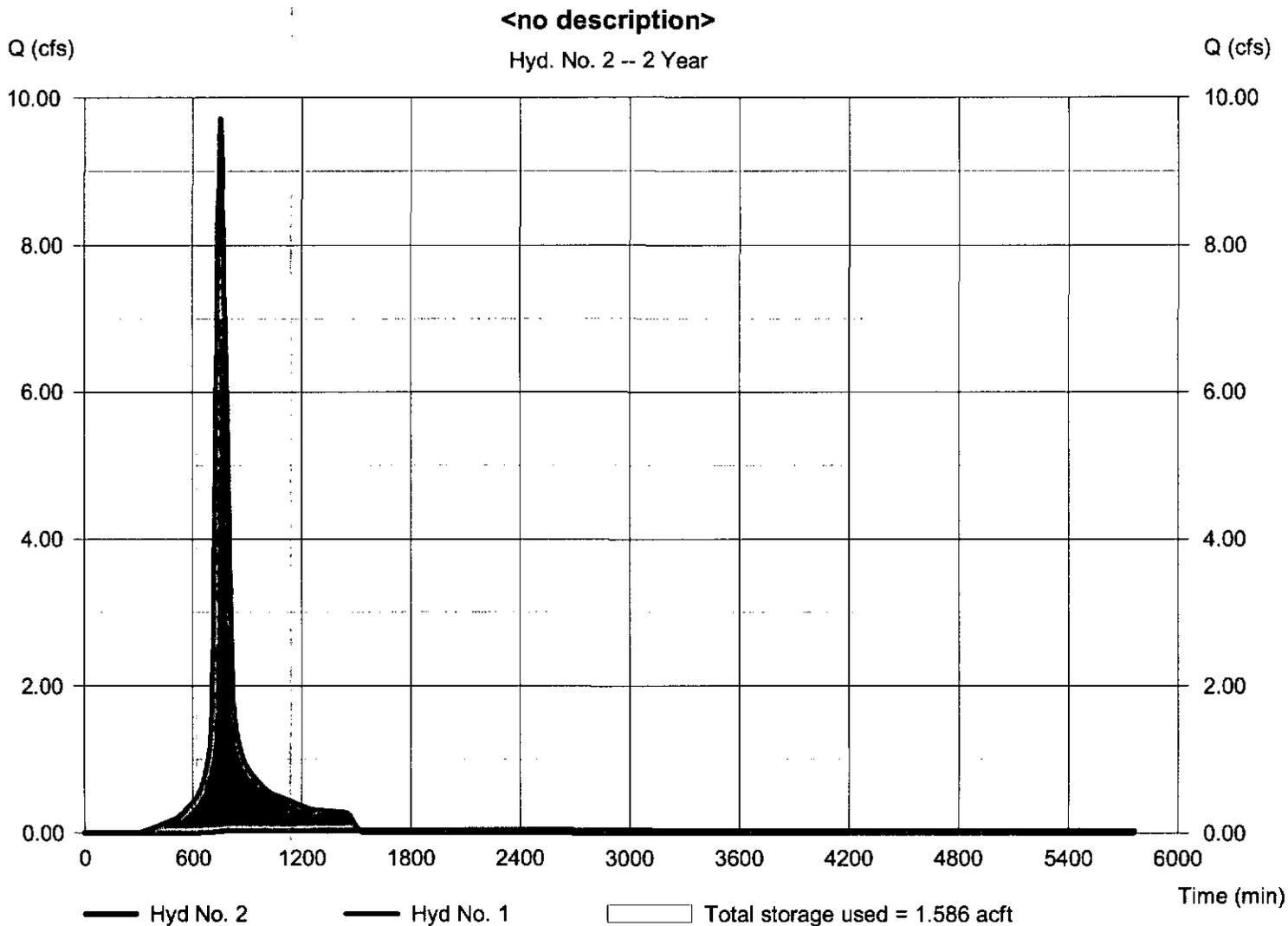
Hyd. No. 2

<no description>

Hydrograph type = Reservoir
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyd. No. = 1 - WW2nd
 Reservoir name = Exist_Pond

Peak discharge = 0.036 cfs
 Time to peak = 1518 min
 Hyd. volume = 0.247 acft
 Max. Elevation = 1285.14 ft
 Max. Storage = 1.586 acft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.02

Monday, Mar 5, 2007

Pond No. 1 - Exist_Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 1282.00 ft

Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (acft) | Total storage (acft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00 | 1282.00 | 8,000 | 0.000 | 0.000 |
| 1.00 | 1283.00 | 20,451 | 0.316 | 0.316 |
| 2.00 | 1284.00 | 25,390 | 0.525 | 0.841 |
| 3.00 | 1285.00 | 30,555 | 0.641 | 1.482 |
| 4.00 | 1286.00 | 36,320 | 0.767 | 2.248 |
| 5.00 | 1287.00 | 221,815 | 2.662 | 4.910 |

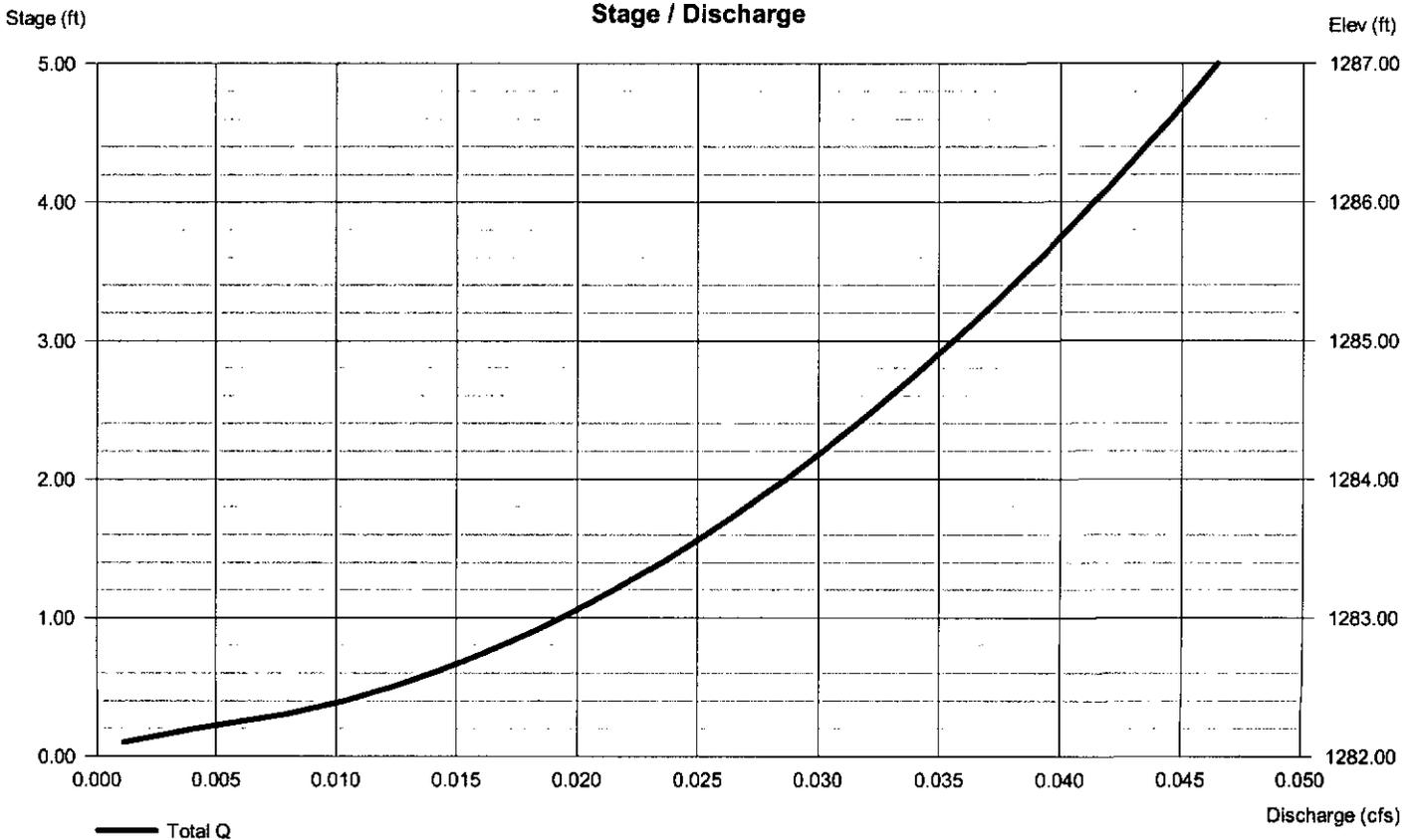
Culvert / Orifice Structures

| | [A] | [B] | [C] | [PrfRsr] |
|-----------------|-----------|------|------|----------|
| Rise (in) | = 2.00 | 0.00 | 0.00 | 0.00 |
| Span (in) | = 2.00 | 0.00 | 0.00 | 0.00 |
| No. Barrels | = 1 | 0 | 0 | 0 |
| Invert El. (ft) | = 1282.00 | 0.00 | 0.00 | 0.00 |
| Length (ft) | = 200.00 | 0.00 | 0.00 | 0.00 |
| Slope (%) | = 0.00 | 0.00 | 0.00 | n/a |
| N-Value | = .013 | .013 | .013 | n/a |
| Orifice Coeff. | = 0.60 | 0.60 | 0.60 | 0.60 |
| 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. | = 2.60 | 3.33 | 3.33 | 3.33 |
| Weir Type | = Broad | -- | -- | -- |
| Multi-Stage | = No | No | No | No |
| Exfil.(in/hr) | = 0.000 (by Contour) | | | |
| TW Elev. (ft) | = 0.00 | | | |

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Hyd. volume (acft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (acft) | Hydrograph description | |
|---------------|--------------------------|-----------------|---------------------|--------------------|-----------------------|---------------|------------------------|-------------------------|------------------------|--|
| 1 | SCS Runoff | 13.14 | 2 | 754 | 2.221 | --- | ---- | ---- | WW2nd | |
| 2 | Reservoir | 0.041 | 2 | 1522 | 0.279 | 1 | 1285.91 | 2.18 | <no description> | |
| ExistPond.gpw | | | | | Return Period: 5 Year | | | Monday, Mar 5, 2007 | | |

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Monday, Mar 5, 2007

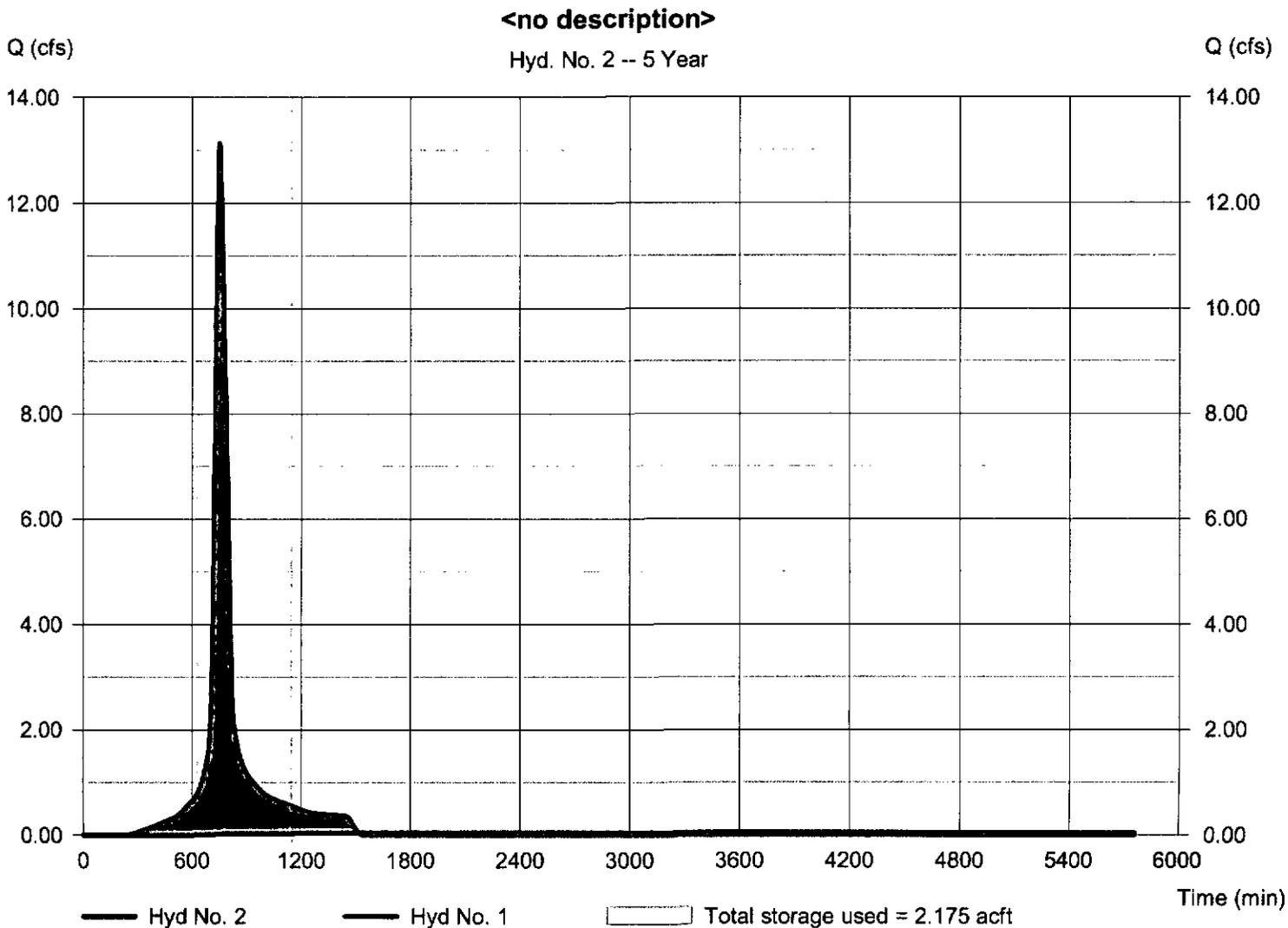
Hyd. No. 2

<no description>

Hydrograph type = Reservoir
 Storm frequency = 5 yrs
 Time interval = 2 min
 Inflow hyd. No. = 1 - WW2nd
 Reservoir name = Exist_Pond

Peak discharge = 0.041 cfs
 Time to peak = 1522 min
 Hyd. volume = 0.279 acft
 Max. Elevation = 1285.91 ft
 Max. Storage = 2.175 acft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.02

Monday, Mar 5, 2007

Pond No. 1 - Exist_Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 1282.00 ft

Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (acft) | Total storage (acft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00 | 1282.00 | 8,000 | 0.000 | 0.000 |
| 1.00 | 1283.00 | 20,451 | 0.316 | 0.316 |
| 2.00 | 1284.00 | 25,390 | 0.525 | 0.841 |
| 3.00 | 1285.00 | 30,555 | 0.641 | 1.482 |
| 4.00 | 1286.00 | 36,320 | 0.767 | 2.248 |
| 5.00 | 1287.00 | 221,815 | 2.662 | 4.910 |

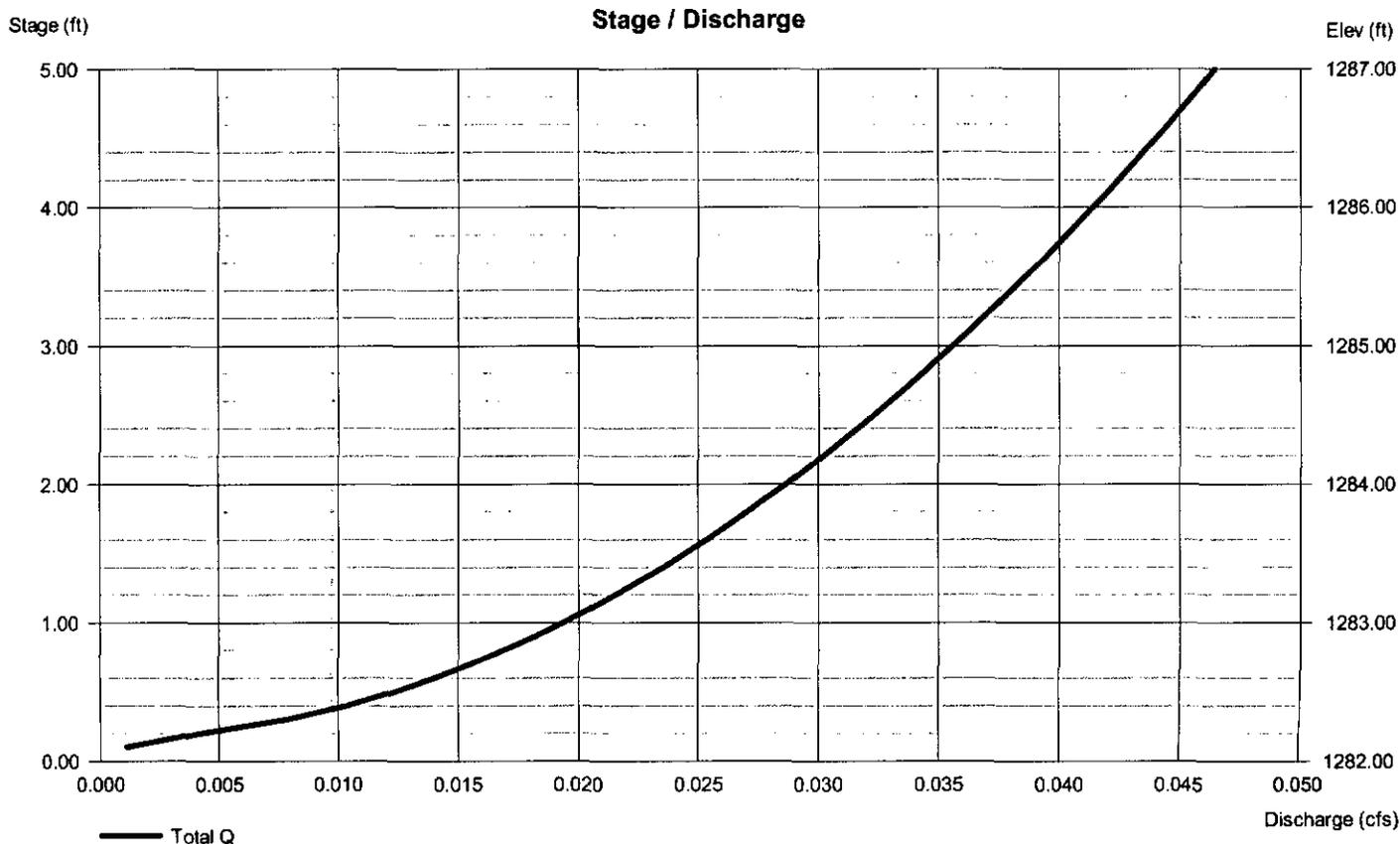
Culvert / Orifice Structures

| | [A] | [B] | [C] | [PrfRsr] |
|-----------------|-----------|------|------|----------|
| Rise (in) | = 2.00 | 0.00 | 0.00 | 0.00 |
| Span (in) | = 2.00 | 0.00 | 0.00 | 0.00 |
| No. Barrels | = 1 | 0 | 0 | 0 |
| Invert El. (ft) | = 1282.00 | 0.00 | 0.00 | 0.00 |
| Length (ft) | = 200.00 | 0.00 | 0.00 | 0.00 |
| Slope (%) | = 0.00 | 0.00 | 0.00 | n/a |
| N-Value | = .013 | .013 | .013 | n/a |
| Orifice Coeff. | = 0.60 | 0.60 | 0.60 | 0.60 |
| 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. | = 2.60 | 3.33 | 3.33 | 3.33 |
| Weir Type | = Broad | --- | --- | --- |
| Multi-Stage | = No | No | No | No |
| Exfil. (in/hr) | = 0.000 (by Contour) | | | |
| TW Elev. (ft) | = 0.00 | | | |

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir users are checked for orifice conditions.



Hydrograph Summary Report

Hydraflow Hydrographs by Intellisolve v9.02

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Hyd. volume (acft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (acft) | Hydrograph description | |
|---------------|--------------------------|-----------------|---------------------|--------------------|------------------------|---------------|------------------------|-------------------------|------------------------|--|
| 1 | SCS Runoff | 15.52 | 2 | 754 | 2.642 | --- | ---- | ---- | WW2nd | |
| 2 | Reservoir | 0.042 | 2 | 1522 | 0.293 | 1 | 1286.13 | 2.59 | <no description> | |
| ExistPond.gpw | | | | | Return Period: 10 Year | | | Monday, Mar 5, 2007 | | |

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Monday, Mar 5, 2007

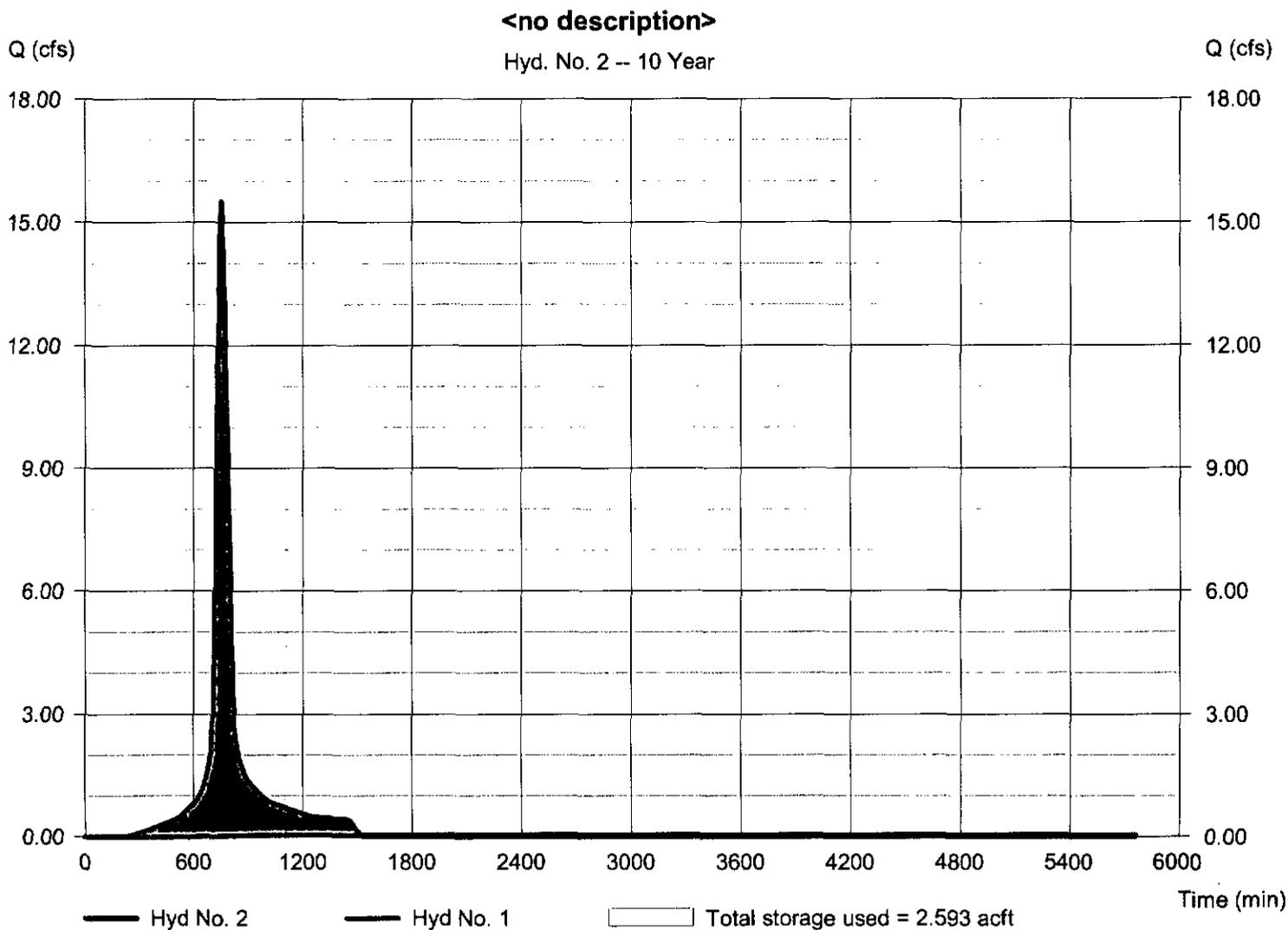
Hyd. No. 2

<no description>

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyd. No. = 1 - WW2nd
 Reservoir name = Exist_Pond

Peak discharge = 0.042 cfs
 Time to peak = 1522 min
 Hyd. volume = 0.293 acft
 Max. Elevation = 1286.13 ft
 Max. Storage = 2.593 acft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.02

Monday, Mar 5, 2007

Pond No. 1 - Exist_Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 1282.00 ft

Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (acft) | Total storage (acft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00 | 1282.00 | 8,000 | 0.000 | 0.000 |
| 1.00 | 1283.00 | 20,451 | 0.316 | 0.316 |
| 2.00 | 1284.00 | 25,390 | 0.525 | 0.841 |
| 3.00 | 1285.00 | 30,555 | 0.641 | 1.482 |
| 4.00 | 1286.00 | 36,320 | 0.767 | 2.248 |
| 5.00 | 1287.00 | 221,815 | 2.662 | 4.910 |

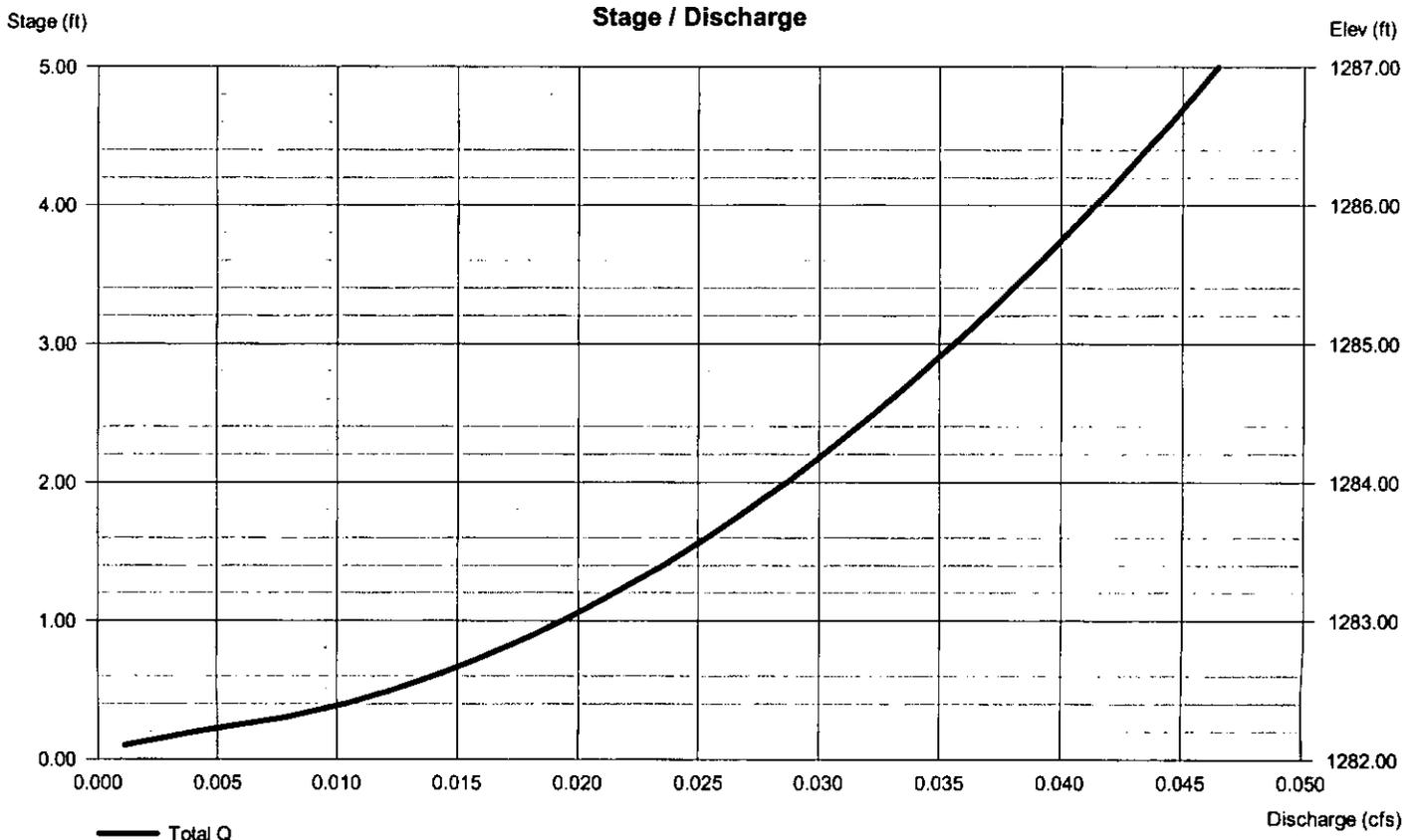
Culvert / Orifice Structures

| | [A] | [B] | [C] | [PrfRsr] |
|-----------------|-----------|------|------|----------|
| Rise (in) | = 2.00 | 0.00 | 0.00 | 0.00 |
| Span (in) | = 2.00 | 0.00 | 0.00 | 0.00 |
| No. Barrels | = 1 | 0 | 0 | 0 |
| Invert El. (ft) | = 1282.00 | 0.00 | 0.00 | 0.00 |
| Length (ft) | = 200.00 | 0.00 | 0.00 | 0.00 |
| Slope (%) | = 0.00 | 0.00 | 0.00 | n/a |
| N-Value | = .013 | .013 | .013 | n/a |
| Orifice Coeff. | = 0.60 | 0.60 | 0.60 | 0.60 |
| 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. | = 2.60 | 3.33 | 3.33 | 3.33 |
| Weir Type | = Broad | -- | -- | -- |
| Multi-Stage | = No | No | No | No |
| Exfil. (in/hr) | = 0.000 (by Contour) | | | |
| TW Elev. (ft) | = 0.00 | | | |

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Hyd. volume (acft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (acft) | Hydrograph description |
|---------------|--------------------------|-----------------|---------------------|--------------------|------------------------|---------------|------------------------|-------------------------|------------------------|
| 1 | SCS Runoff | 18.23 | 2 | 754 | 3.126 | --- | ----- | ----- | WW2nd |
| 2 | Reservoir | 0.043 | 2 | 1524 | 0.301 | 1 | 1286.31 | 3.07 | <no description> |
| ExistPond.gpw | | | | | Return Period: 25 Year | | Monday, Mar 5, 2007 | | |

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Monday, Mar 5, 2007

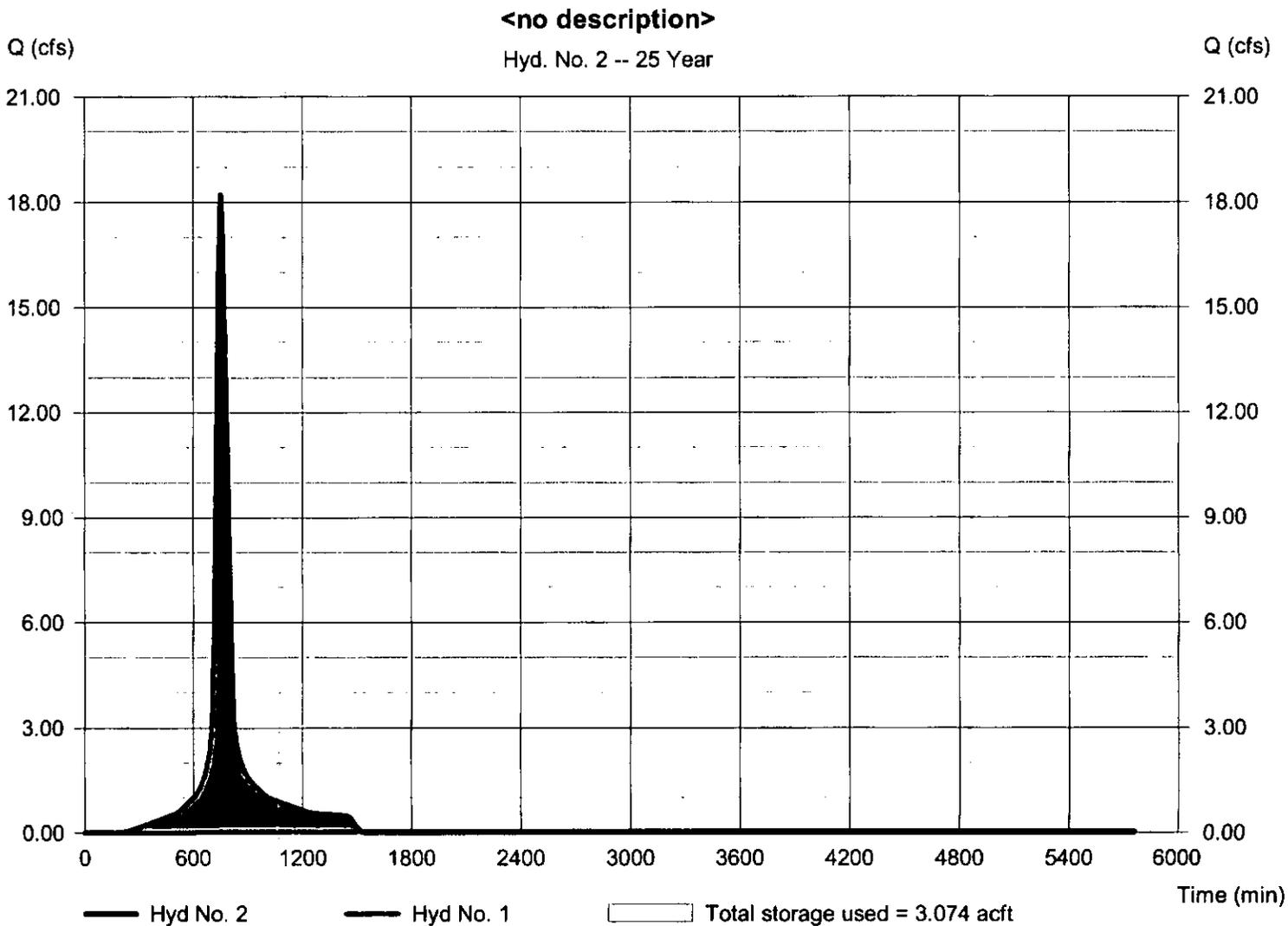
Hyd. No. 2

<no description>

Hydrograph type = Reservoir
 Storm frequency = 25 yrs
 Time interval = 2 min
 Inflow hyd. No. = 1 - WW2nd
 Reservoir name = Exist_Pond

Peak discharge = 0.043 cfs
 Time to peak = 1524 min
 Hyd. volume = 0.301 acft
 Max. Elevation = 1286.31 ft
 Max. Storage = 3.074 acft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.02

Monday, Mar 5, 2007

Pond No. 1 - Exist_Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1282.00 ft

Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (acft) | Total storage (acft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00 | 1282.00 | 8,000 | 0.000 | 0.000 |
| 1.00 | 1283.00 | 20,451 | 0.316 | 0.316 |
| 2.00 | 1284.00 | 25,390 | 0.525 | 0.841 |
| 3.00 | 1285.00 | 30,555 | 0.641 | 1.482 |
| 4.00 | 1286.00 | 36,320 | 0.767 | 2.248 |
| 5.00 | 1287.00 | 221,815 | 2.662 | 4.910 |

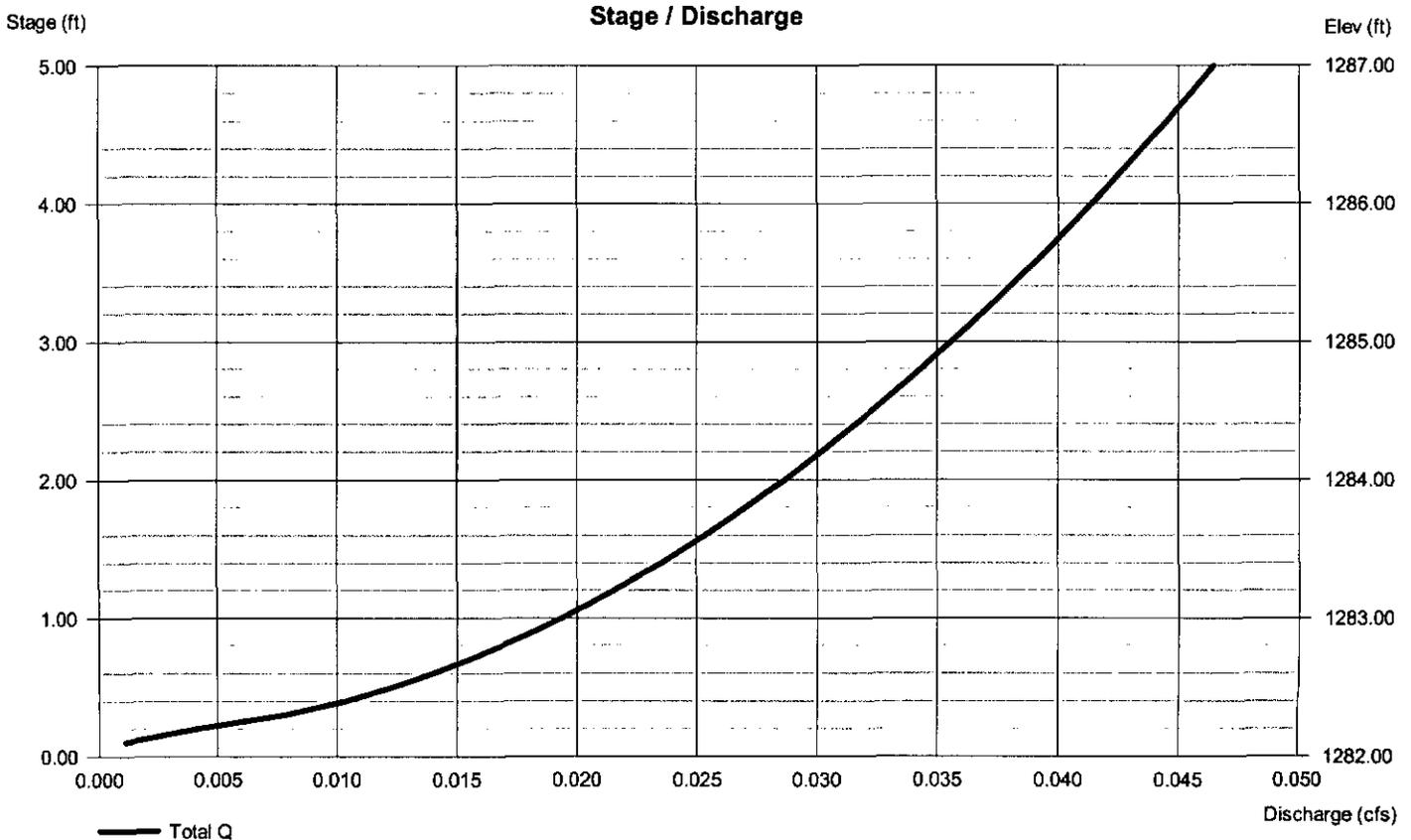
Culvert / Orifice Structures

| | [A] | [B] | [C] | [PrfRsr] |
|-----------------|-----------|------|------|----------|
| Rise (in) | = 2.00 | 0.00 | 0.00 | 0.00 |
| Span (in) | = 2.00 | 0.00 | 0.00 | 0.00 |
| No. Barrels | = 1 | 0 | 0 | 0 |
| Invert El. (ft) | = 1282.00 | 0.00 | 0.00 | 0.00 |
| Length (ft) | = 200.00 | 0.00 | 0.00 | 0.00 |
| Slope (%) | = 0.00 | 0.00 | 0.00 | n/a |
| N-Value | = .013 | .013 | .013 | n/a |
| Orifice Coeff. | = 0.60 | 0.60 | 0.60 | 0.60 |
| 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. | = 2.60 | 3.33 | 3.33 | 3.33 |
| Weir Type | = Broad | --- | --- | --- |
| Multi-Stage | = No | No | No | No |
| Exfil. (in/hr) | = 0.000 (by Contour) | | | |
| TW Elev. (ft) | = 0.00 | | | |

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Hyd. volume (acft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (acft) | Hydrograph description | |
|---------------|--------------------------|-----------------|---------------------|--------------------|------------------------|---------------|------------------------|-------------------------|------------------------|--|
| 1 | SCS Runoff | 21.61 | 2 | 754 | 3.734 | --- | ----- | ----- | WW2nd | |
| 2 | Reservoir | 0.044 | 2 | 1526 | 0.311 | 1 | 1286.54 | 3.68 | <no description> | |
| ExistPond.gpw | | | | | Return Period: 50 Year | | | Monday, Mar 5, 2007 | | |

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Monday, Mar 5, 2007

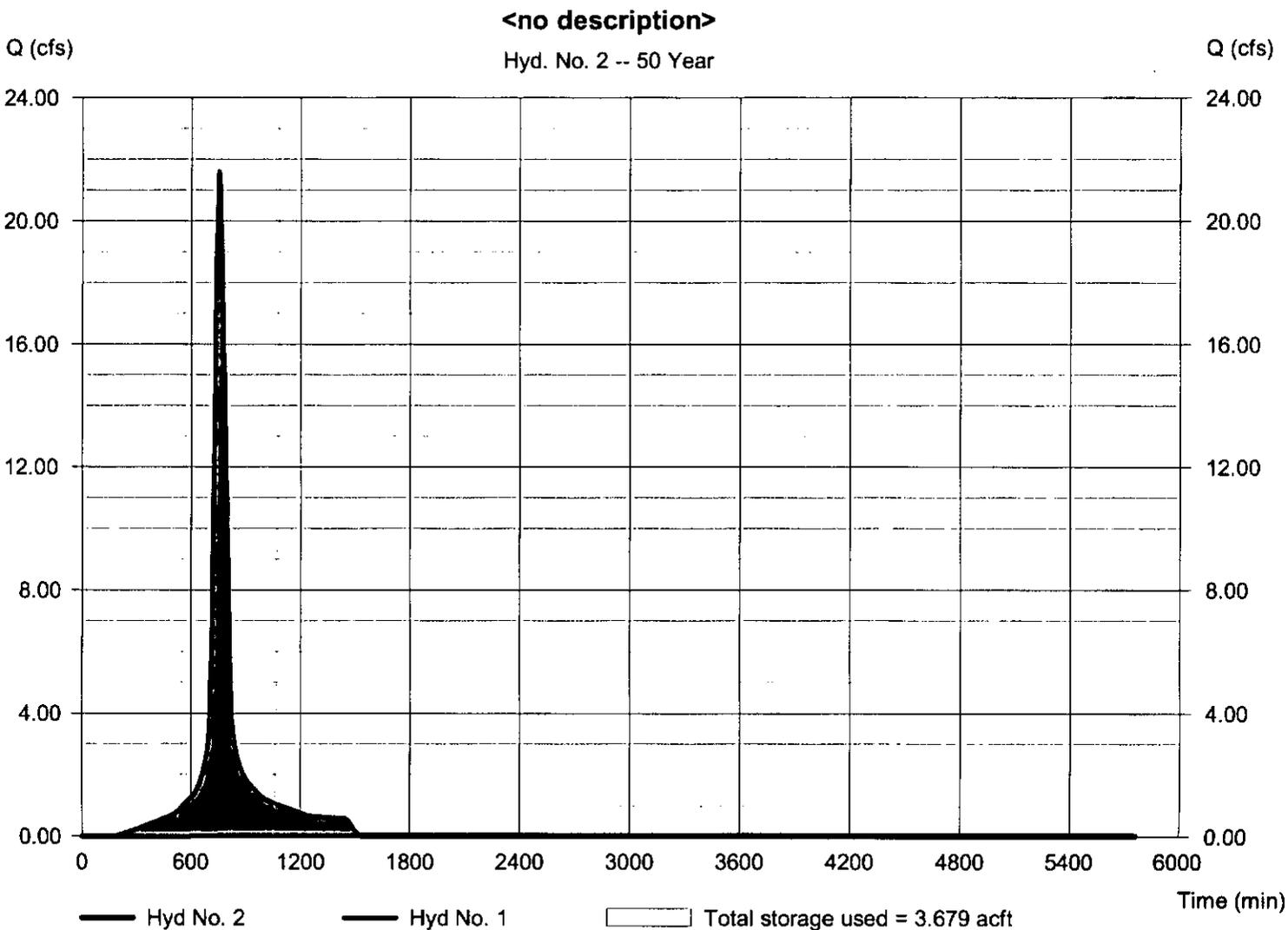
Hyd. No. 2

<no description>

Hydrograph type = Reservoir
 Storm frequency = 50 yrs
 Time interval = 2 min
 Inflow hyd. No. = 1 - WW2nd
 Reservoir name = Exist_Pond

Peak discharge = 0.044 cfs
 Time to peak = 1526 min
 Hyd. volume = 0.311 acft
 Max. Elevation = 1286.54 ft
 Max. Storage = 3.679 acft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.02

Monday, Mar 5, 2007

Pond No. 1 - Exist_Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 1282.00 ft

Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (acft) | Total storage (acft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00 | 1282.00 | 8,000 | 0.000 | 0.000 |
| 1.00 | 1283.00 | 20,451 | 0.316 | 0.316 |
| 2.00 | 1284.00 | 25,390 | 0.525 | 0.841 |
| 3.00 | 1285.00 | 30,555 | 0.641 | 1.482 |
| 4.00 | 1286.00 | 36,320 | 0.767 | 2.248 |
| 5.00 | 1287.00 | 221,815 | 2.662 | 4.910 |

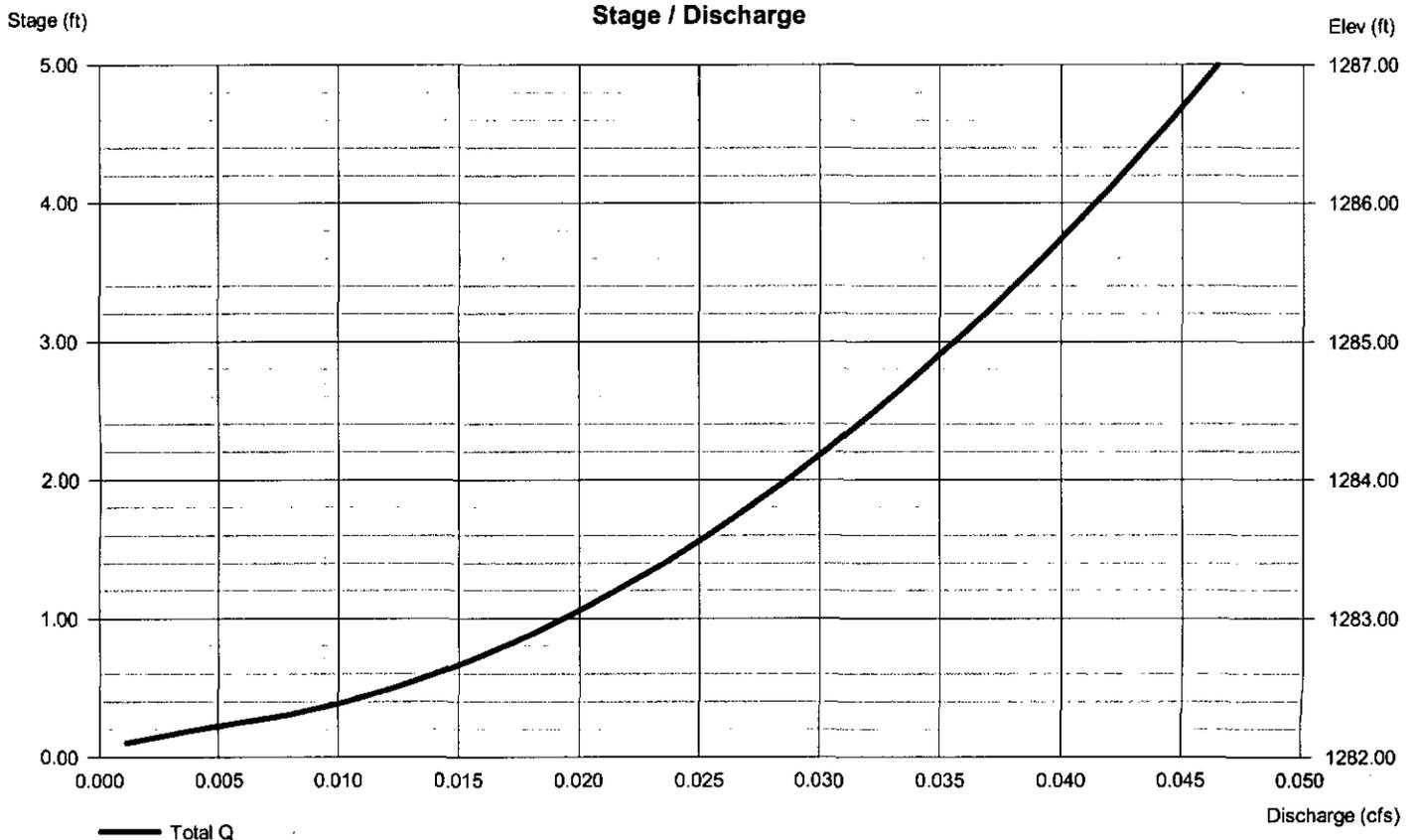
Culvert / Orifice Structures

| | [A] | [B] | [C] | [PrfRsr] |
|-----------------|-----------|------|------|----------|
| Rise (in) | = 2.00 | 0.00 | 0.00 | 0.00 |
| Span (in) | = 2.00 | 0.00 | 0.00 | 0.00 |
| No. Barrels | = 1 | 0 | 0 | 0 |
| Invert El. (ft) | = 1282.00 | 0.00 | 0.00 | 0.00 |
| Length (ft) | = 200.00 | 0.00 | 0.00 | 0.00 |
| Slope (%) | = 0.00 | 0.00 | 0.00 | n/a |
| N-Value | = .013 | .013 | .013 | n/a |
| Orifice Coeff. | = 0.60 | 0.60 | 0.60 | 0.60 |
| 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. | = 2.60 | 3.33 | 3.33 | 3.33 |
| Weir Type | = Broad | --- | --- | --- |
| Multi-Stage | = No | No | No | No |
| Exfil.(in/hr) | = 0.000 (by Contour) | | | |
| TW Elev. (ft) | = 0.00 | | | |

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir risers are checked for orifice conditions.



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.02

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to peak (min) | Hyd. volume (acft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (acft) | Hydrograph description |
|---------------|--------------------------|-----------------|---------------------|--------------------|-------------------------|---------------|------------------------|-------------------------|------------------------|
| 1 | SCS Runoff | 24.29 | 2 | 754 | 4.221 | --- | ----- | ----- | WW2nd |
| 2 | Reservoir | 0.045 | 2 | 1528 | 0.318 | 1 | 1286.72 | 4.16 | <no description> |
| ExistPond.gpw | | | | | Return Period: 100 Year | | | Monday, Mar 5, 2007 | |

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.02

Monday, Mar 5, 2007

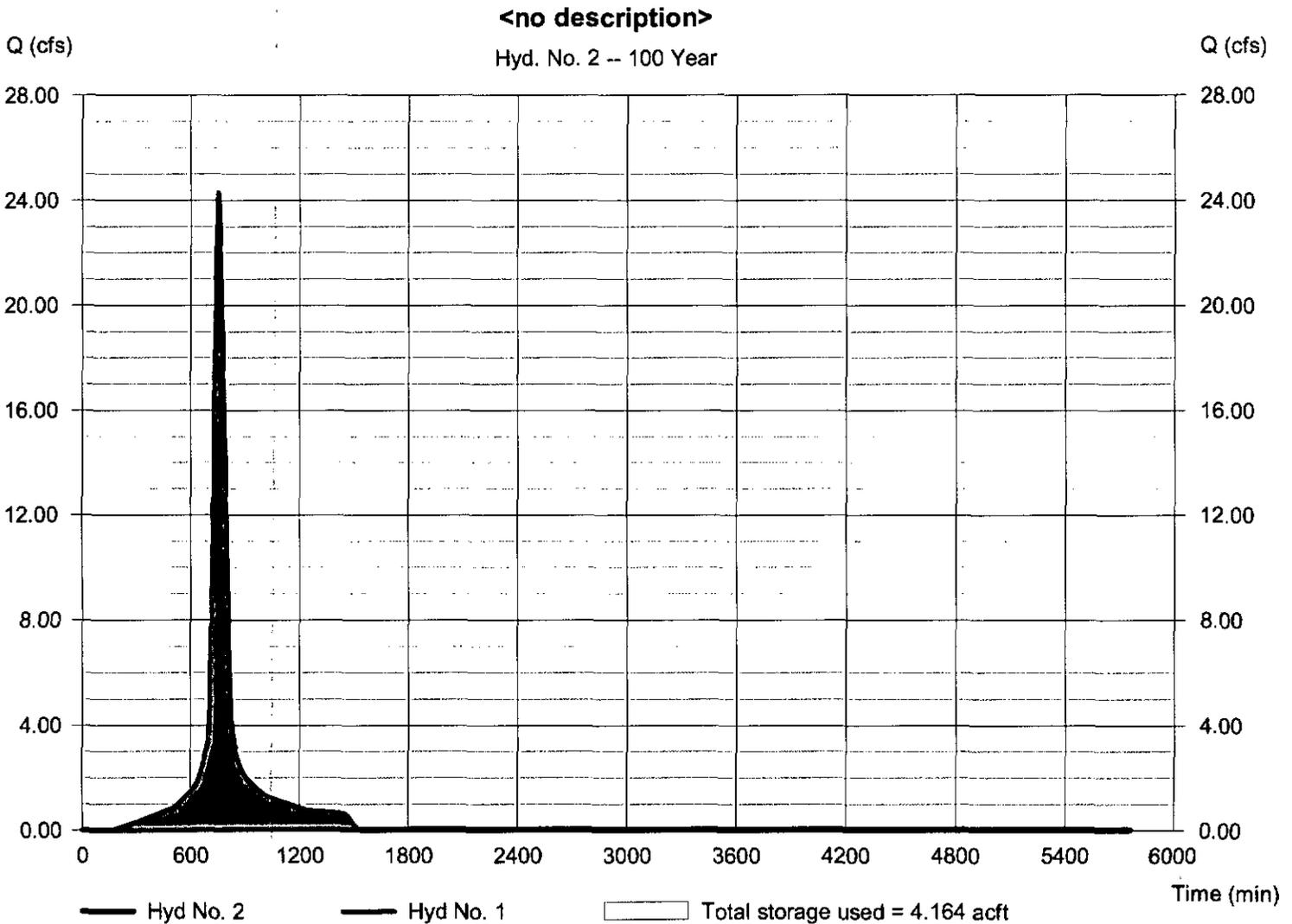
Hyd. No. 2

<no description>

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyd. No. = 1 - WW2nd
 Reservoir name = Exist_Pond

Peak discharge = 0.045 cfs
 Time to peak = 1528 min
 Hyd. volume = 0.318 acft
 Max. Elevation = 1286.72 ft
 Max. Storage = 4.164 acft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.02

Monday, Mar 5, 2007

Pond No. 1 - Exist_Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 1282.00 ft

Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (acft) | Total storage (acft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00 | 1282.00 | 8,000 | 0.000 | 0.000 |
| 1.00 | 1283.00 | 20,451 | 0.316 | 0.316 |
| 2.00 | 1284.00 | 25,390 | 0.525 | 0.841 |
| 3.00 | 1285.00 | 30,555 | 0.641 | 1.482 |
| 4.00 | 1286.00 | 36,320 | 0.767 | 2.248 |
| 5.00 | 1287.00 | 221,815 | 2.662 | 4.910 |

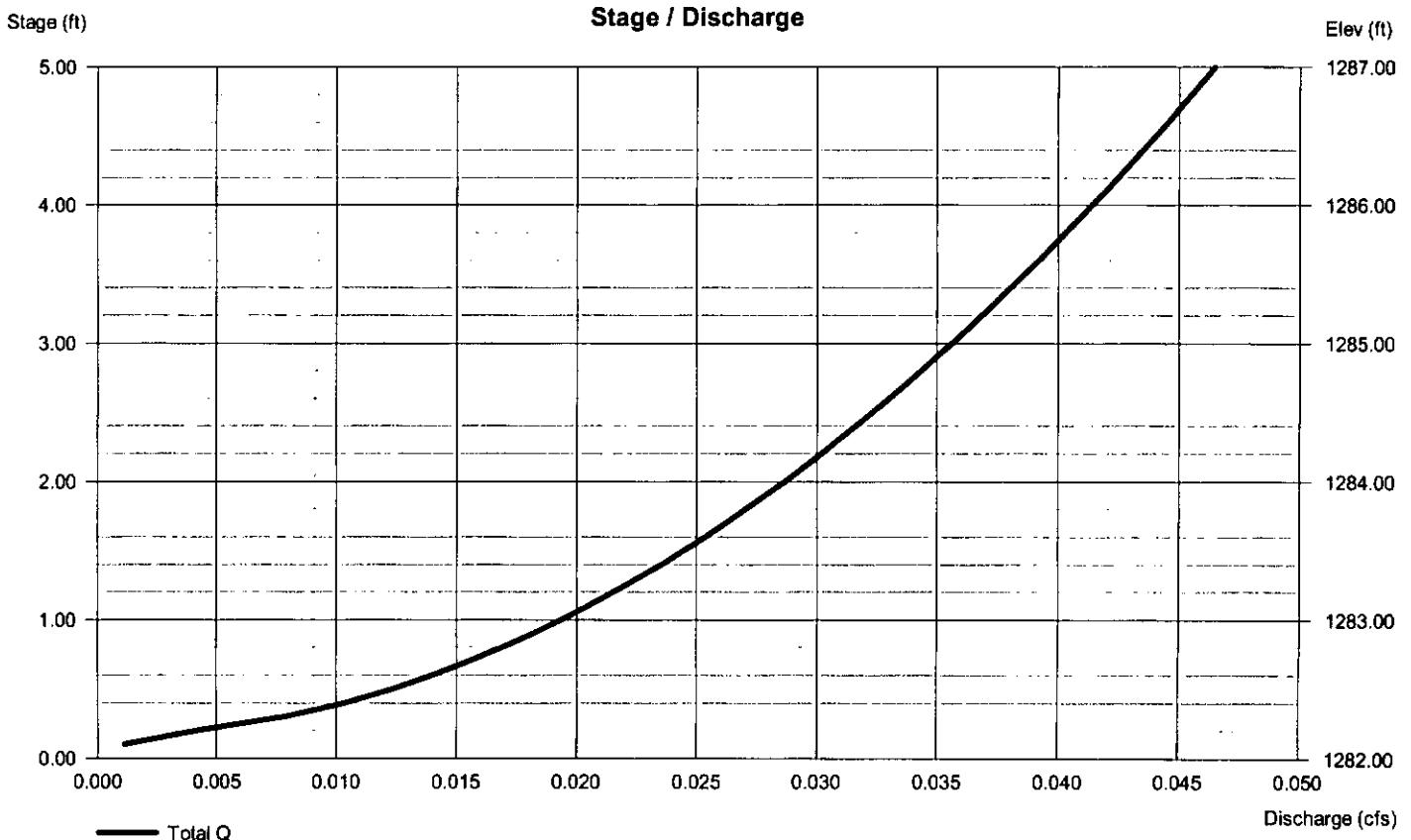
Culvert / Orifice Structures

| | [A] | [B] | [C] | [PrfRsr] |
|-----------------|-----------|------|------|----------|
| Rise (in) | = 2.00 | 0.00 | 0.00 | 0.00 |
| Span (in) | = 2.00 | 0.00 | 0.00 | 0.00 |
| No. Barrels | = 1 | 0 | 0 | 0 |
| Invert El. (ft) | = 1282.00 | 0.00 | 0.00 | 0.00 |
| Length (ft) | = 200.00 | 0.00 | 0.00 | 0.00 |
| Slope (%) | = 0.00 | 0.00 | 0.00 | n/a |
| N-Value | = .013 | .013 | .013 | n/a |
| Orifice Coeff. | = 0.60 | 0.60 | 0.60 | 0.60 |
| 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. | = 2.60 | 3.33 | 3.33 | 3.33 |
| Weir Type | = Broad | --- | --- | --- |
| Multi-Stage | = No | No | No | No |
| Exfil. (in/hr) | = 0.000 (by Contour) | | | |
| TW Elev. (ft) | = 0.00 | | | |

Note: Culvert/Orifice outflows are analyzed under inlet and outlet control. Weir users are checked for orifice conditions.



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PLAN SHEETS

DRAINAGE PLAN

Scale 1:100