DRAINAGE PLAN
Falcon Falls 3rd Addition
TO
WICHITA, SEDGWICK COUNTY, KANSAS

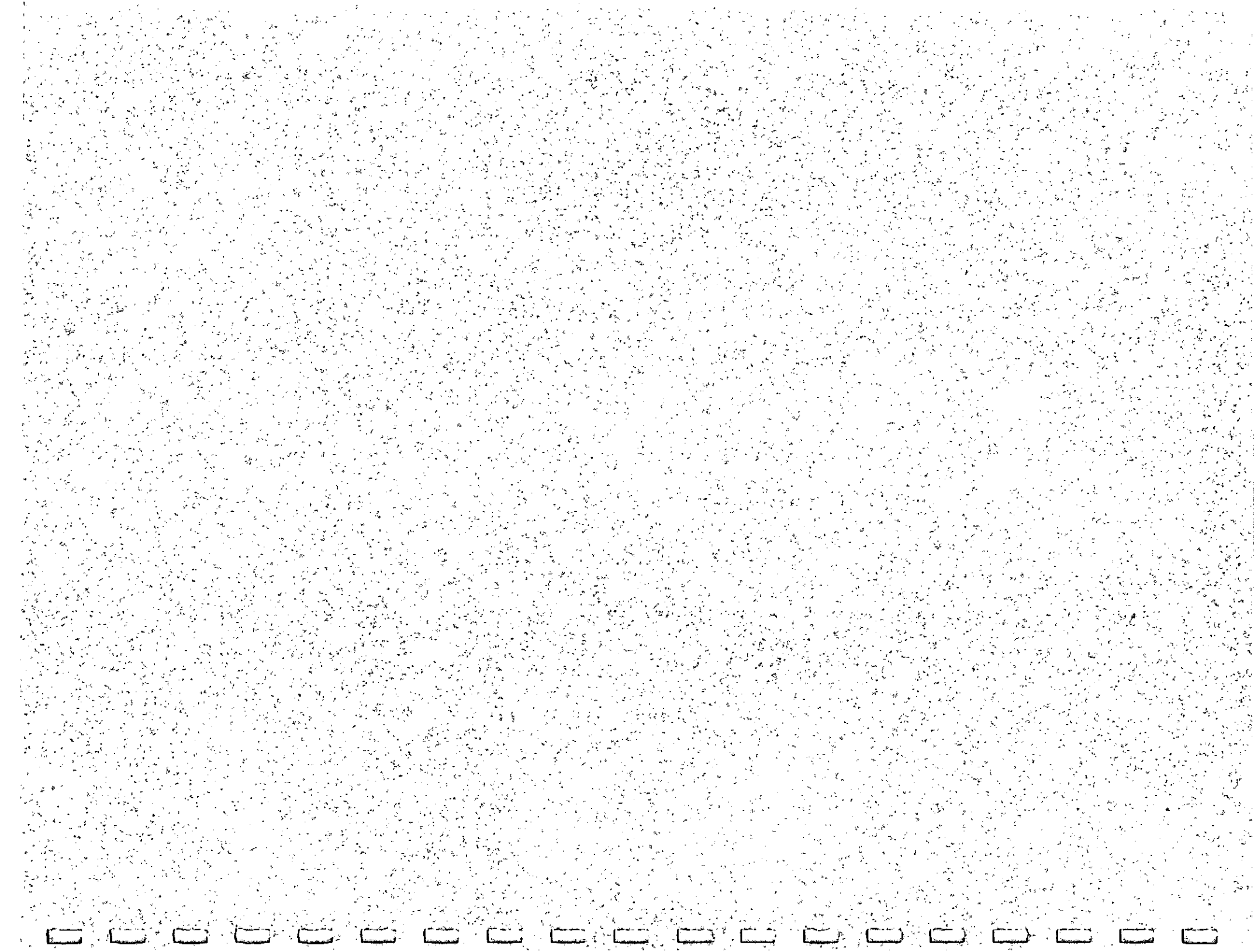
Prepared By

Baughman

ENGINEERING | SURVEYING | PLANNING
LANDSCAPE ARCHITECTURE

August 5, 2005
REVISED August 16, 2005

BRIAN L. GLENN
LICENSED
16284
KANSAS
PROFESSIONAL ENGINEER
8/17/2005



Baughman

August 17, 2005

Mr. Scott C. Lindebak, P.E.
City of Wichita Department of Public Works
Engineering Division
City Hall, 7th Floor
455 North Main
Wichita, KS 67202

RE: Falcon Falls 3rd Addition Drainage Comments

Scott:

We have received your letter from August 11, 2005 that was addressed to Mr. Phil Meyer. We have addressed your request and offer the following comments that correspond to your itemization.

1. A project narrative has been written for the Drainage Plan
2. Plan sheets and Report has been sealed, signed, and dated
3. A copy of the effective FIRM and FIS Profile has been included.
4. The floodplain limits are shown on the Drainage Plan per scaled location, as this is the effective floodplain and floodway limits as acknowledged by FEMA and The State of Kansas' Division of Water Resources. However, we have delineated the limits of inundation based on the effective 100-yr elevations as identified in the Flood Insurance Study for Sedgwick County, Kansas.
5. A minimum pad elevation has been established for Lot 8, Block A, which will provide a minimum of two feet of freeboard.
6. The project was does not increase the elevations of the Regulatory Floodway nor does it generate an increase in the Base Flood Elevation (B.F.E.) at our project limits. Therefore, as per Federal Code, a Conditional Letter of Map Revision is not required. However, per the request of the property owner, a CLOMR was obtained. Also, the Division of Water Resources and the United States Army Corps of Engineers has approved this project.

ENGINEERING
SURVEYING
PLANNING
LANDSCAPE ARCHITECTURE

Baughman Company, P.A.
315 E. 11th
Wichita, Kansas 67211
P 316-262-7271 F 316-262-0149

7. Placement of fill material within the 100-yr floodplain has been reviewed by both FEMA and DWR. Modifications to the floodway and floodplains are permitted under the Code of Federal Regulations and Kansas State Statutes, provided that no property owner is adversely affected without his/her permission. No requirement for "compensatory storage" has been implemented under Federal Code, State Statute, or City Ordinance.
8. Topography within "Reserve C" was not obtained due to very dense vegetation. The Drainage Plan sheet has been revised to show the proposed development grading.
9. An exhibit of the USGS Quadrangle
10. Summary tables have been provided
11. A Pond Pack schematic has been provided.
12. As per the City of Wichita's written design standards, only the 5-yr and 100-yr events are addressed with detention routing. Stormwater sewers are to "be designed as pressure systems for the initial storm...", where the initial storm for residential areas is the 2-yr return period. We have provided calculations for three required return periods within this report, the 2-yr, 5-yr, and 100-yr events.
13. Final contour grading will be provided at a later date.
14. Pond routings have been updated to reflect the 2-yr, 5-yr, and 100-yr return periods
15. Falcon Falls 3rd Addition has no proposed weir structure. The 100-yr discharge from the proposed pond is entirely controlled by the underground conduit. Addition calculation of the pond routing was performed assuming that the Middle Fork Chisholm Creek was at the 100-yr flood level at the same time the detention pond experiences a 100-yr rainfall event. This analysis is more stringent that the USACOE of recommendation along the Wichita-Valley Center Flood Control Project.
16. As stated above, there is no designed overflow structure within Falcon Falls 3rd Addition.
17. The grading of Falcon Falls 3rd Addition meets the minimum requirements of freeboard. Additionally, this project will also have conditions placed by the developer on each lot that addresses "possible water encroachment".

18. The point of concern for the Falcon Falls development project is at the 45th St. No. bridge structure. Independent stormwater sewer systems are not required to provided detention if the overall development can demonstrate that there is no increase in the flowrates at the project limits.
19. Easements will be provided for all stormwater sewer systems.
20. Reserve E is primarily for preservation of the existing trees.
21. Grading plan provides spot elevations where we feel they are necessary to provide adequate protection of the primary structures on the lots.
22. Our firm designs the lot grading to provide adequate protection of the structures due to ponding effects and for protection of the structures in the event of a blockage of the underground stormwater sewers in sump areas.
23. An entrance culvert has been added and sized to the drainage plan.
24. This has been deleted.
25. We would like to discuss this requirement with you further.

If you have any questions regarding the above responses, please contact me at (316) 262-7271.

Thank you,

Sincerely,
Baughman Co., P.A.

Brian L. Glenn, P.E.
Drainage Engineer

Encl. Revised Drainage Plan and Report

Cc: Mr. Christopher M. Carrier, P.E. (w/o encl.)
Mr. James Armour, P.E. (w/o encl.)
Ms. Vicky Huang, P.E. (w/o encl.)
Mr. N. Brent Wooten, P.E., (w/o encl.)
Mr. Jay W. Russell, (w/o encl.)

Baughman

ADDITIONAL DRAINAGE INFORMATION
FALCON FALLS 3RD ADDITION
15 AUGUST 2005

The proposed Falcon Falls 3rd Addition is located in Wichita, Sedgwick County, Kansas at the northwest intersection of Hillside Avenue and 45th Street North. The legal description of this property is as follows:

THAT PART OF THE NE1/4 OF SEC. 22, TWP. 26-S, R-1-E OF THE 6TH P.M., SEDGWICK COUNTY, KANSAS, EXCEPT THAT PART PLATTED AS FALCON FALLS ADDITION, TO WICHITA, SEDGWICK COUNTY, KANSAS, AND EXCEPT THAT PART PLATTED AS WICHITA HEIGHTS HIGH SCHOOL ADDITION, AN ADDITION TO WICHITA, SEDGWICK COUNTY, KANSAS, TOGETHER WITH THAT PART OF SE1/4 OF SEC. 22, TWP. 26-S, R-1-E OF THE 6TH P.M., SEDGWICK COUNTY, KANSAS, EXCEPT THAT PART PLATTED AS FALCON FALLS ADDITION, TO WICHITA, SEDGWICK COUNTY, KANSAS, AND EXCEPT THAT PORTION OF KANSAS HIGHWAY 254 CONDEMNED IN CASE B-19603, ALL BEING SUBJECT TO ROAD RIGHTS OF WAY OF RECORD.

The proposed project consists of approximately 63± acres to be developed into a residential subdivision with approximately 142 lots. The existing site is an agricultural field with wooded areas lining the west perimeter as well as the southeast perimeter of the site. There is also a tree row near the east edge which will be retained. The proposed development will include approximately 142 lots with 1 detention pond. There is also a 3 pond system which serves Falcon Falls Addition, Falcon Falls 2nd Addition, as well as the proposed Falcon Falls 3rd Addition. This system was proposed and approved in the Falcon Falls 2nd Addition Drainage Plan.

The existing runoff for the site is approximately 287 cubic feet per second (cfs). The proposed conditions constitute an increase in the total runoff for a total of 337 cfs. With the proposed pond system, the total site runoff is reduced to 186 cfs. The pond has a peak inflow of 188 cfs and a peak outflow of 37 cfs. This calculation accounts for the tailwater effect of the 100-yr elevation of the Middle Fork Chisholm Creek.

The detention effect of the northeast pond system will further reduce the total discharge of the site. As stated above, this system was approved in the Falcon Falls 2nd Addition Drainage Plan.

ENGINEERING
SURVEYING
PLANNING
LANDSCAPE ARCHITECTURE

Baughman Company, P.A.
315 Ellis
Wichita, Kansas 67211
P 316-262-7271 F 316-262-0149

Letters of Approval

Federal Emergency Management Agency

Washington, D.C. 20472

MAR 14 2005

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 04-07-A181R

The Honorable Dave Unruh
Chairman, Sedgwick County
Board of Commissioners
525 North Main, Suite 320
Wichita, KS 67203

Community: Sedgwick County, KS
Community No.: 200321

104

Dear Mr. Unruh:

This responds to a request that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) comment on the effects that a proposed project would have on the effective Flood Insurance Rate Map (FIRM), Flood Boundary and Floodway Map (FBFM), and Flood Insurance Study (FIS) report for your community, in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated May 4, 2004, Mr. Scott C. Lindebak, P.E., Drainage Engineer, Baughman Company, P.A., requested that FEMA evaluate the effects that proposed development of a residential subdivision and commercial center along Middle Fork Chisholm Creek would have on the flood hazard information shown on the effective FIRM, FBFM, and FIS report. The proposed development will consist of channelization, placement of fill, and construction of three ponds within the regulatory floodway and the Special Flood Hazard Area (SFHA), the area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood), along Middle Fork Chisholm Creek from just upstream of 45th Street North to just downstream of Hillside Avenue.

All data required to complete our review of this request for a Conditional Letter of Map Revision (CLOMR) were submitted with letters from Mr. Brian L. Glenn, P.E., Drainage Engineer, also with Baughman Company, P.A., and Mr. Lindebak.

We reviewed the submitted data and the data used to prepare the effective FIRM and FBFM for your community and determined that the proposed project meets the minimum floodplain management criteria of the NFIP. The submitted corrected effective HEC-2 hydraulic computer model, dated February 16, 2005, referred to as the existing conditions model for our review, based on updated topographic information, was used as the base conditions model in our review of the proposed conditions model for this CLOMR request. We believe that, if the proposed project is constructed as shown on the submitted topographic work map entitled "Falcon Falls Workmap, Wichita, Sedgwick County, Kansas," prepared by Baughman Company, P.A., dated March 1, 2005, and the data listed below are received, a revision to the FIRM, FBFM, and FIS report would be warranted. The revision will extend along Middle Fork Chisholm Creek from approximately 150 feet downstream of 45th Street North to approximately 2,570 feet upstream of Hillside Avenue.

Additional surveyed cross sections were added to the effective hydraulic model to develop an existing conditions hydraulic model. Our review of existing conditions revealed that the Base Flood Elevations (BFEs) for Middle Fork Chisholm Creek increased and decreased compared to the effective BFEs. The maximum increase in BFE, 1.7 feet, occurred approximately 290 feet downstream of Hillside Avenue. The maximum decrease in BFE, 0.7 foot, occurred just downstream of 45th Street North.

As a result of the proposed project, the BFEs will decrease compared to the existing conditions BFEs for Middle Fork Chisholm Creek. The maximum decrease in BFE, 2.0 feet, will occur approximately 160 feet downstream of Hillside Avenue.

As a result of the proposed project and updated topographic information, the BFEs for Middle Fork Chisholm Creek will increase in some areas and decrease in other areas compared to the effective BFEs. The maximum increase in BFE, 1.2 feet, will occur approximately 80 feet upstream of Hillside Avenue. The maximum decrease in BFE, 0.7 foot, will occur just downstream of 45th Street North.

As a result of the proposed project and updated topographic information, the width of the SFHA along Middle Fork Chisholm Creek will increase in some areas and decrease in other areas compared to the effective SFHA width. The maximum increase in SFHA width, approximately 290 feet, will occur approximately 900 feet downstream of Hillside Avenue. The maximum decrease in SFHA width, approximately 1,260 feet, will occur approximately 1,040 feet upstream of 45th Street North.

As a result of the proposed project and updated topographic information, the width of the regulatory floodway along Middle Fork Chisholm Creek will increase in some areas and decrease in other areas compared to the effective floodway width. The maximum increase in floodway width, approximately 170 feet, will occur approximately 1,160 feet downstream of Hillside Avenue. The maximum decrease in floodway width, approximately 480 feet, will occur at Hillside Avenue.

Upon completion of the project, your community may submit the data listed below and request that we make a final determination on revising the effective FIRM, FBFM, and FIS report.

- Detailed application and certification forms, which were used in processing this request, must be used for requesting final revisions to the maps. Therefore, when the map revision request for the area covered by this letter is submitted, Form 1, entitled "Overview & Concurrence Form," must be included. (A copy of this form is enclosed.)

- The detailed application and certification forms listed below must be submitted:

  Form 2, entitled "Riverine Hydrology & Hydraulics Form"

  Form 3, entitled "Riverine Structures Form"

  Hydraulic analyses, for as-built conditions, of the base flood; the floods having a 10-, 2-, and 0.2-percent chance of being equaled or exceeded in any given year; and the regulatory floodway, together with a topographic work map, must be submitted with Form 2.

  The topographic work map must show the locations and alignments of all modeled cross sections; the stream centerline; and both the effective and as-built conditions boundaries of the base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway within the downstream and upstream limits of revision. The topographic work map also must show how the as-built conditions floodway and base floodplain tie into the effective floodway and base floodplain at or within the downstream and upstream limits of revision.

- Effective September 1, 2002, FEMA revised the fee schedule for reviewing and processing requests for conditional and final modifications to published flood information and maps. In

accordance with this schedule, the current fee for this map revision request is $3,800 and must be received before we can begin processing the request. Please note, however, that the fee schedule is subject to change, and requesters are required to submit the fee in effect at the time of the submittal. Payment of this fee shall be made in the form of a check or money order, made payable in U.S. funds to the National Flood Insurance Program, or by credit card. The payment must be forwarded to the following address:

Federal Emergency Management Agency
Fee-Charge System Administrator
P.O. Box 22787
Alexandria, VA 22304

- As-built plans, certified by a registered professional engineer, of all proposed project elements

- A copy of the public notice distributed by your community stating its intent to revise the regulatory floodway, or a statement by your community that it has notified all affected property owners and affected adjacent jurisdictions. The notice must include the extent of the revision, the changes to the floodway, and contact information for any interested parties.

- Copies of the affected portions of FIRM Panel 200321 0150 A and FBFM Panel 200321 0150 for the unincorporated areas of Sedgwick County, Kansas, both dated June 3, 1986, annotated to reflect as-built conditions

- Documentation of the individual legal notices that were sent to property owners who will be adversely affected by any increase in width and/or shifting of the base floodplain and/or any increases in the BFEs for Middle Fork Chisholm Creek within the limits of revision. Legal notice may take the form of certified mailing receipts or certification that all property owners have been notified, with an accompanying mailing list and a copy of the letter sent.

    - If you submit notification of and acceptance from the adversely affected property owners, FEMA can issue a Letter of Map Revision (LOMR) that is effective on the date of issuance.

    - If you submit notification of, but not acceptance by, the adversely affected property owners, FEMA may issue a LOMR that will become effective 3 to 6 months after the date of issuance.

After receiving appropriate documentation to show that the project has been completed, FEMA will initiate a revision to the FIRM, FBFM, and FIS report. Because the BFEs would change as a result of the project, a 90-day appeal period would be initiated, during which community officials and interested persons may appeal the revised BFEs based on scientific or technical data.

The basis of this CLOMR is, in whole or in part, a channel-modification project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities assure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel rests with your community.

This CLOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on

knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by calling the Director, Federal Insurance and Mitigation Division of FEMA in Kansas City, Missouri, at (816) 283-7002. If you have any questions regarding this CLOMR, please call our Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Emily Hirsch, CFM, Project Engineer
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

For: Doug Bellomo, P.E., Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

Enclosures

cc: Mr. Robert George, CFM
Floodplain Management Technician
Department of Code Enforcement
Sedgwick County

Mr. Shawn Bryan
City of Wichita

Mr. Brian L. Glenn, P.E.
Drainage Engineer
Baughman Company, P.A.

Mr. Jay W. Russell
Heights, LLC

Federal Emergency Management Agency

Washington, D.C. 20472

MAR 14 2005

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 04-07-A181R

The Honorable Dave Unruh
Chairman, Sedgwick County
Board of Commissioners
525 North Main, Suite 320
Wichita, KS 67203

Community: Sedgwick County, KS
Community No.: 200321

104

Dear Mr. Unruh:

This responds to a request that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) comment on the effects that a proposed project would have on the effective Flood Insurance Rate Map (FIRM), Flood Boundary and Floodway Map (FBFM), and Flood Insurance Study (FIS) report for your community, in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated May 4, 2004, Mr. Scott C. Lindebak, P.E., Drainage Engineer, Baughman Company, P.A., requested that FEMA evaluate the effects that proposed development of a residential subdivision and commercial center along Middle Fork Chisholm Creek would have on the flood hazard information shown on the effective FIRM, FBFM, and FIS report. The proposed development will consist of channelization, placement of fill, and construction of three ponds within the regulatory floodway and the Special Flood Hazard Area (SFHA), the area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood), along Middle Fork Chisholm Creek from just upstream of 45th Street North to just downstream of Hillside Avenue.

All data required to complete our review of this request for a Conditional Letter of Map Revision (CLOMR) were submitted with letters from Mr. Brian L. Glenn, P.E., Drainage Engineer, also with Baughman Company, P.A., and Mr. Lindebak.

We reviewed the submitted data and the data used to prepare the effective FIRM and FBFM for your community and determined that the proposed project meets the minimum floodplain management criteria of the NFIP. The submitted corrected effective HEC-2 hydraulic computer model, dated February 16, 2005, referred to as the existing conditions model for our review, based on updated topographic information, was used as the base conditions model in our review of the proposed conditions model for this CLOMR request. We believe that, if the proposed project is constructed as shown on the submitted topographic work map entitled "Falcon Falls Workmap, Wichita, Sedgwick County, Kansas," prepared by Baughman Company, P.A., dated March 1, 2005, and the data listed below are received, a revision to the FIRM, FBFM, and FIS report would be warranted. The revision will extend along Middle Fork Chisholm Creek from approximately 150 feet downstream of 45th Street North to approximately 2,570 feet upstream of Hillside Avenue.

Additional surveyed cross sections were added to the effective hydraulic model to develop an existing conditions hydraulic model. Our review of existing conditions revealed that the Base Flood Elevations (BFEs) for Middle Fork Chisholm Creek increased and decreased compared to the effective BFEs. The maximum increase in BFE, 1.7 feet, occurred approximately 290 feet downstream of Hillside Avenue. The maximum decrease in BFE, 0.7 foot, occurred just downstream of 45th Street North.

As a result of the proposed project, the BFEs will decrease compared to the existing conditions BFEs for Middle Fork Chisholm Creek. The maximum decrease in BFE, 2.0 feet, will occur approximately 160 feet downstream of Hillside Avenue.

As a result of the proposed project and updated topographic information, the BFEs for Middle Fork Chisholm Creek will increase in some areas and decrease in other areas compared to the effective BFEs. The maximum increase in BFE, 1.2 feet, will occur approximately 80 feet upstream of Hillside Avenue. The maximum decrease in BFE, 0.7 foot, will occur just downstream of 45th Street North.

As a result of the proposed project and updated topographic information, the width of the SFHA along Middle Fork Chisholm Creek will increase in some areas and decrease in other areas compared to the effective SFHA width. The maximum increase in SFHA width, approximately 290 feet, will occur approximately 900 feet downstream of Hillside Avenue. The maximum decrease in SFHA width, approximately 1,260 feet, will occur approximately 1,040 feet upstream of 45th Street North.

As a result of the proposed project and updated topographic information, the width of the regulatory floodway along Middle Fork Chisholm Creek will increase in some areas and decrease in other areas compared to the effective floodway width. The maximum increase in floodway width, approximately 170 feet, will occur approximately 1,160 feet downstream of Hillside Avenue. The maximum decrease in floodway width, approximately 480 feet, will occur at Hillside Avenue.

Upon completion of the project, your community may submit the data listed below and request that we make a final determination on revising the effective FIRM, FBFM, and FIS report.

- Detailed application and certification forms, which were used in processing this request, must be used for requesting final revisions to the maps. Therefore, when the map revision request for the area covered by this letter is submitted, Form 1, entitled "Overview & Concurrence Form," must be included. (A copy of this form is enclosed.)

- The detailed application and certification forms listed below must be submitted:

  Form 2, entitled "Riverine Hydrology & Hydraulics Form"

  Form 3, entitled "Riverine Structures Form"

  Hydraulic analyses, for as-built conditions, of the base flood; the floods having a 10-, 2-, and 0.2-percent chance of being equaled or exceeded in any given year; and the regulatory floodway, together with a topographic work map, must be submitted with Form 2.

  The topographic work map must show the locations and alignments of all modeled cross sections; the stream centerline; and both the effective and as-built conditions boundaries of the base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway within the downstream and upstream limits of revision. The topographic work map also must show how the as-built conditions floodway and base floodplain tie into the effective floodway and base floodplain at or within the downstream and upstream limits of revision.

- Effective September 1, 2002, FEMA revised the fee schedule for reviewing and processing requests for conditional and final modifications to published flood information and maps. In

accordance with this schedule, the current fee for this map revision request is $3,800 and must be received before we can begin processing the request. Please note, however, that the fee schedule is subject to change, and requesters are required to submit the fee in effect at the time of the submittal. Payment of this fee shall be made in the form of a check or money order, made payable in U.S. funds to the National Flood Insurance Program, or by credit card. The payment must be forwarded to the following address:

Federal Emergency Management Agency
Fee-Charge System Administrator
P.O. Box 22787
Alexandria, VA 22304

- As-built plans, certified by a registered professional engineer, of all proposed project elements

- A copy of the public notice distributed by your community stating its intent to revise the regulatory floodway, or a statement by your community that it has notified all affected property owners and affected adjacent jurisdictions. The notice must include the extent of the revision, the changes to the floodway, and contact information for any interested parties.

- Copies of the affected portions of FIRM Panel 200321 0150 A and FBFM Panel 200321 0150 for the unincorporated areas of Sedgwick County, Kansas, both dated June 3, 1986, annotated to reflect as-built conditions

- Documentation of the individual legal notices that were sent to property owners who will be adversely affected by any increase in width and/or shifting of the base floodplain and/or any increases in the BFEs for Middle Fork Chisholm Creek within the limits of revision. Legal notice may take the form of certified mailing receipts or certification that all property owners have been notified, with an accompanying mailing list and a copy of the letter sent.

    - If you submit notification of and acceptance from the adversely affected property owners, FEMA can issue a Letter of Map Revision (LOMR) that is effective on the date of issuance.

    - If you submit notification of, but not acceptance by, the adversely affected property owners, FEMA may issue a LOMR that will become effective 3 to 6 months after the date of issuance.

After receiving appropriate documentation to show that the project has been completed, FEMA will initiate a revision to the FIRM, FBFM, and FIS report. Because the BFEs would change as a result of the project, a 90-day appeal period would be initiated, during which community officials and interested persons may appeal the revised BFEs based on scientific or technical data.

The basis of this CLOMR is, in whole or in part, a channel-modification project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities assure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel rests with your community.

This CLOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on

knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by calling the Director, Federal Insurance and Mitigation Division of FEMA in Kansas City, Missouri, at (816) 283-7002. If you have any questions regarding this CLOMR, please call our Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Emily Hirsch, CFM, Project Engineer
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

For: Doug Bellomo, P.E., Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

Enclosures

cc: Mr. Robert George, CFM
Floodplain Management Technician
Department of Code Enforcement
Sedgwick County

Mr. Shawn Bryan
City of Wichita

Mr. Brian L. Glenn, P.E.
Drainage Engineer
Baughman Company, P.A.

Mr. Jay W. Russell
Heights, LLC

CERTIFICATE OF SERVICE

On this 25th day of June, 2004, I hereby certify that the attached Approval of Application and Permit to Proceed, File No. 45,830, dated June 22, 2004 was mailed postage prepaid, first class, US mail to the following:

Heights, LLC
c/o Jay W. Russell
12602 W 13th St. North
Wichita, KS 67235

Scott Lindebak
Baughman Co. PA
315 Ellis
Wichita, KS 67211

Dorothy McHallom
Staff

COPY FOR YOUR INFORMATION

KANSAS

DEPARTMENT OF AGRICULTURE
ADRIAN J. POLANSKY, SECRETARY

KATHLEEN SEBELIUS, GOVERNOR

HEIGHTS LLC
C/O JAY W RUSSELL
12602 W 13TH ST NORTH
WICHITA KS 67235

June 25, 2004

RE: Appropriation of Water
File No. 45,830

Dear Mr. Russell:

There is enclosed a permit to appropriate water authorizing you to proceed with construction of the proposed diversion works (except those dams and stream obstructions regulated by K.S.A. 82a-301 through 305a), to divert such unappropriated water as may be available from the source and at the location specified in the permit, and to use it for the purpose and at the location described in the permit.

Your attention is directed to the enclosures and to the terms, conditions, and limitations specified in this permit. Records must be maintained from which the quantity of water actually diverted may be readily determined. Such records shall be furnished to the Chief Engineer by March 1 following the end of each calendar year.

Failure to notify the Chief Engineer of the Division of Water Resources of the completion of the diversion works within the time allowed, or within any authorized extension of time thereof, will result in the dismissal of this permit. Enclosed is a form which may be used to notify the Chief Engineer that the proposed diversion works have been completed.

All requests for extensions of time to complete diversion works, or to perfect appropriations, must be submitted to the Chief Engineer before the expiration of time originally set forth in the permit to complete diversion works or to perfect an appropriation.

If for any reason, you require an extension of time, you must request it before the expiration of time set forth in this permit. Failure to comply with this regulation will result in the dismissal of your permit or your water right. Any request for an extension of time shall be accompanied by the required statutory fee, which is currently $100.00.

There is also enclosed an information sheet setting forth the procedure to obtain a Certificate of Appropriation which will establish the extent of your water right.

Division of Water Resources David L. Pope, Chief Engineer
109 SW 9th ST., 2nd Floor Topeka, KS 66612-1283
Voice (785) 296-3717 Fax (785) 296-1176 http://www.accesskansas.org/kdo

If you have any questions, please contact our office. If you wish to discuss a specific file, please have the file number ready so that we may help you more efficiently.

Sincerely,

William J. Gilliland, L. G.
Permits Unit Head
Water Appropriation Program

WJG:MDJ
Enclosures
pc: Stafford Field Office
Scott Lindebak, Baughman Co., PA

COPY FOR YOUR INFORMATION

THE STATE OF KANSAS

KANSAS DEPARTMENT OF AGRICULTURE
Adrian J. Polansky, Secretary of Agriculture

DIVISION OF WATER RESOURCES
David L. Pope, Chief Engineer

APPROVAL OF APPLICATION
and
PERMIT TO PROCEED

(This is not a Certificate of Appropriation)

This is to certify that I have examined Application **File No. 45,830** of the applicant

Heights, L.L.C.
c/o Jay W. Russell
12602 West 13th Street North
Wichita, Kansas 67235

for a permit to appropriate water for beneficial use, together with the maps, plans and other submitted data, and that the application is hereby approved and the applicant is hereby authorized, subject to vested rights and prior appropriations, to proceed with the construction of the proposed diversion works (except those dams and stream obstructions regulated by K.S.A. 82a-301 through 305a, as amended), and to proceed with all steps necessary for the application of the water to the approved and proposed beneficial use and otherwise perfect the proposed appropriation subject to the following terms, conditions and limitations:

1. That the priority date assigned to such application is **January 28, 2004.**

2. That the water sought to be appropriated shall be used for recreational use in a reservoir with a maximum surface area of 3.3 acres located in the East Half of the Southeast Quarter (E½ SE¼) of Section 22, in Township 26 South, Range 1 East, Sedgwick County, Kansas.

3. That the appropriation sought shall be limited to natural flows of Middle Fork Chisholm Creek, not needed to satisfy all vested rights and prior appropriation rights to be stored to a maximum extent of **15.69 acre-feet** per calendar year in a reservoir created by a weir located in the Southeast Quarter of the Southwest Quarter of the Southeast Quarter (SE¼SW¼SE¼)of Section 22, more particularly described as being near a point 200 feet North and 1,400 feet West of the Southeast corner of said section, in Township 26 South, Range 1 East, Sedgwick County, Kansas.

4. That in accordance with K.A.R. 5-6-6 a maximum quantity not to exceed **24.33 acre-feet** of water may also be diverted to complete the initial filling of the reservoir only and shall not count toward perfection of a water right under the authority of this permit. Subsequent refilling of the reservoir shall require authorization under a term permit.

5. That the structure creating the above described reservoir have been assigned Division of Water Resources Structures Permit No. CSG-0224.

6. That installation of works for diversion of water shall be completed on or before **December 31, 2005**, or within any authorized extension thereof. The applicant shall notify the Chief Engineer and pay the statutorily required field inspection fee, which is currently $400.00, when construction of the works has been completed. Failure to timely submit the notice and the fee will result in revocation of the permit. Any request for an extension of time shall be submitted prior to the expiration of the deadline and shall be accompanied by the required statutory fee, which is currently $100.00.

7. That the proposed appropriation shall be perfected by the actual application of water to the proposed beneficial use on or before **December 31, 2009**, or any authorized extension thereof. Any request for an extension of time shall be submitted prior to the expiration of the deadline and shall be accompanied by the required statutory fee, which is currently $100.00.

8. That the applicant shall not be deemed to have acquired a water appropriation for a quantity in excess of the amount approved herein nor in excess of the amount found by the Chief Engineer to have been actually used for the approved purpose during one calendar year subsequent to approval of the application and within the time specified for perfection or any authorized extension thereof.

9. That the use of water herein authorized shall not be made so as to impair any use under existing water rights nor prejudicially and unreasonably affect the public interest.

10. That the right of the appropriator shall relate to a specific quantity of water and such right must allow for a reasonable raising or lowering of the static water level and for the reasonable increase or decrease of the streamflow at the appropriator's point of diversion.

11. That this permit does not constitute authority under K.S.A. 82a-301 to 305a to construct any dam or other obstruction; nor does it grant any right-of-way, or authorize entry upon or injury to, public or private property.

12. That the applicant shall maintain accurate and complete records from which the quantity of water diverted during each calendar year may be readily determined and the applicant shall file an annual water use report with the Chief Engineer by March 1, following the end of each calendar year. Failure to file the annual water use report by the due date shall cause the applicant to be subject to a civil penalty.

13. That no water user shall engage in nor allow the waste of any water diverted under the authority of this permit.

14. That failure without cause to comply with provisions of the permit and its terms, conditions and limitations will result in the forfeiture of the priority date, revocation of the permit and dismissal of the application.

15. That the right to appropriate water under authority of this permit is subject to any minimum desirable streamflow requirements identified and established pursuant to K.S.A. 82a-703c for the source of supply to which this water right applies.

16. That the Chief Engineer specifically retains jurisdiction in this matter with authority to make such reasonable reductions in the approved rate of diversion and quantity authorized to be perfected, and such changes in other terms, conditions, and limitations set forth in this approval and permit to proceed as may be deemed to be in the public interest.

17. That the diversion of water authorized by this permit shall consist of flood flows of the stream, and diversion shall not take place when the stream contains only base flow.

This Order shall become a final agency action, as defined by K.S.A. 77-607(b), without further notice to the parties, if a request for hearing or a petition for administrative review is not filed as set forth below.

Request for Hearing. According to K.A.R. 5-14-3(c), any party who desires a hearing must submit a request within 15 days after the date shown on the Certificate of Service attached to this Order. Filing a request for a hearing will give you the opportunity to submit additional facts for consideration, contest any findings made by the Chief Engineer or present any other information you believe should be considered in this matter. A timely-filed request for hearing will stay the deadline for requesting administrative review of this Order pending the outcome of the hearing.

Petition for Review. The applicant, if aggrieved by this Order, may petition for administrative review, pursuant to K.S.A. 82a-711(c) and K.S.A. 82a-1901(a). The petition must be filed within 30 days after the date shown on the Certificate of Service attached to this Order and must set forth the basis for the review, unless stayed by the timely filing of a request for hearing.

Any request for hearing or petition for administrative review shall be in writing and shall be submitted to the attention of: Chief Legal Counsel, Kansas Department of Agriculture, 109 SW 9th Street, 4th Floor, Topeka, Kansas 66612, Fax: (785) 368-6668.

Dated at Topeka, Kansas, this 22nd day of June, 2004.

DIVISION OF WATER RESOURCES
DAVID L. POPE
CHIEF ENGINEER
KANSAS DEPARTMENT of AGRICULTURE

David L. Pope, P.E.
Chief Engineer
Division of Water Resources
Kansas Department of Agriculture

State of Kansas)
) SS
County of Shawnee)

The foregoing instrument was acknowledged before me this 22nd day of June, 2004, by David L. Pope, P.E., Chief Engineer, Division of Water Resources, Kansas Department of Agriculture.

Notary Public
Debra L. Mendez
Notary Public
State of Kansas
My Appt. Expires 5/13/06

COPY

KANSAS

DEPARTMENT OF AGRICULTURE
ADRIAN J. POLANSKY, SECRETARY

KATHLEEN SEBELIUS, GOVERNOR

June 22, 2004

HEIGHTS LLC
JAY W RUSSELL
12602 W 13TH ST NORTH
WICHITA KS 67235

RE: Proj.: Falcon Falls
Floodplain Fill, Channel Change and
Outfall Structures
Sedgwick County
Middle Fork Chisholm Creek
WSN's: LSG-0264, SSG-0456,
SSG-0457 & CSG-0224
Notice No.: 04047

Dear Mr. Russell:

Consideration has been given to your application for the approval of plans relating to the placement of fill, the construction of a channel change, including three ponds, and the construction of two outfall structures in, along and across a floodplain of Middle Fork Chisholm Creek at a location in the S ½ of the NE 1/4 and in the SE 1/4, all in Section 22, Township 26 South, Range 1 East, Sedgwick County, Kansas.

In accordance with the provisions of K.S.A. 24-126 and K.S.A. 82a - 301 thru 305a, the Chief Engineer has approved the plans submitted on January 28, 2004 and issued the enclosed approval and permits of application, authorizing construction of the proposed project. Please note the approval and permits conditions on the reverse side of the approval and permits documents. Conditions No. 9 require the owner to notify this office within 30 days after the project is completed. Notice and Proof of Completion forms are enclosed for this purpose. Other special conditions have been added to limit the removal of timber and vegetation, to require the use of clean material for riprap, to prohibit the introduction of toxic or deleterious materials into the watercourse, to require that the project meet the floodplain management requirements of the community, and to prohibit excess material from being deposited in the floodplain not shown on the approved plans.

The one set of plans submitted to this office has been endorsed with the Chief Engineer's approval and will be retained in our files. Should you desire any copies of the plans with the Chief Engineer's approval shown thereon, please submit the required number.

Comments about this proposed project were received from several agencies during the environmental review process. Copies of the letters with recommendations from the environmental review agencies are enclosed for your information.

The work has been authorized to be completed on or before July 1, 2006. Approval for construction of this project will expire on that date unless the time is subsequently specifically extended by the Chief Engineer. Any desired extension of time should be requested in writing approximately 30 days prior to the expiration date.

Sincerely,

David E. Nagle

David E. Nagle
Water Structures Engineer

DEN/dn
Enclosure
pc: Scott Lindebak, P.E.
Baughman Company, P.A.

KANSAS

DEPARTMENT OF WILDLIFE AND PARKS
KATHLEEN SEBELIUS, GOVERNOR

16 April 2004

David E. Nagle, P.E.
KDA, Division of Water Resources
109 SW 9th St.
Topeka, KS 66612

Track: 20040150
Sedgwick
ECA: 04047
Ref: D1.1104

Dear Mr. Nagle:

We reviewed ECA Notice No. 04047, received 23 March 2004. This is an application by Heights, L.L.C. to fill the flood plain and a channel change to an unnamed tributary to Middle Fork Chisholm Creek as part of a residential development in the SE ¼ Section 22, T26S, R1E, Sedgwick County, Kansas. We reviewed how the project could affect crucial wildlife habitats, state-designated critical habitats, state-listed threatened and endangered species, species in need of conservation, and public recreation areas.

We conclude that the project will not occur in any areas designated as critical habitats for any state-listed species. The project will remove some riparian vegetation along the tributary to Middle Fork Chisholm Creek. The Department considers these habitats to be crucial wildlife habitats. We note that the applicant proposes to use native grasses on disturbed areas to be restored. This should help increase wildlife habitat values in these areas. The pit ponds will be excavated off channel and outfall back into the channel. We do recommend not mowing the native grass around the ponds which will help maintain habitat values and help reduce the potential for problems with urban-acclimated resident geese that can become a nuisance. These geese will congregate around water bodies with vegetation that is regularly maintained and tend to avoid higher vegetation. Our District Wildlife Biologist, Charlie Cope (316.683.8069, Region 4 Office, Wichita), could provide the applicant a list of native grass seed that would be shorter than taller native species such a big bluestem, switchgrass, and indian grass. We have no objections to issuing a permit for this project.

This project does not require any Department of Wildlife and Parks permits or special authorizations. If this project does not start within one year of this review's date or project design plans change, the project sponsor must contact us to verify this review's applicability because periodic changes occur to our public land obligations, state T&E species list, and critical habitat designations. By our definition, the project starts when either the project sponsor distributes bid advertisements or work starts.

If you have any questions, feel free to contact me at the Environmental Services Section. Thank you for the opportunity to provide these comments and recommendations.

Sincerely,

Chris Hase

Chris Hase, Ecologist
Environmental Services Section
chrish@wp.state.ks.us

xc: Reg. 4 F&W Sup.; KBS, Liechti; KDHE, Mueldener

Pratt Operations Office
512 SE 25th Ave., Pratt, KS 67124-8174
Phone 620-672-5911 Fax 620-672-6020 www.kdwp.state.ks.us

K-STATE
Kansas State University
Kansas Forest Service
2610 Claflin Rd.
Manhattan, KS 66502-2798
785-532-3300
Fax: 785-532-3305
E-mail: kfs@lisrs.oznet.ksu.edu
http://www.kansasforests.org

Memorandum

TO: Applicant(s)

FROM: Kansas Forest Service, Kansas State University

SUBJECT: Division of Water Resources Permits/Approvals

Under the Water Projects Environmental Coordination Act, the Kansas Forest Service is responsible for reviewing permit applications from the Kansas Department of Agriculture, Division of Water Resources to determine if your project will affect critical forest resources of our state. Due to the large volume of permit applications, we are unable to sufficiently review them all. To provide you with the basic information you need regarding forest resources, we have asked the Division of Water Resources to provide all applicants with the information in this memorandum.

Forest land only makes up approximately four percent of the total land area of Kansas. Any direct affects at a project site can have significant impacts in a local area as well as impacts on the total forest resources of Kansas. Forests provide important benefits in improving water quality, reducing soil erosion, providing wildlife habitat, providing recreational opportunities and producing wood products. Riparian forests, directly associated with streams and rivers, act as filters, reducing sediment flow and filtering out non-point source pollutants before they enter streams or rivers. Any removal of forest land greater than one acre in size should be mitigated, on land suitable for trees, by replanting native trees adapted to the site using a minimum spacing of 10' X 10' or 435 trees per acre.

District Foresters are available, upon request, to provide professional assistance in preparing tree planting plans, including tree species selection, proper planting procedures, weed control recommendations and after planting care. The service is free of charge. Cost-share programs may be available to assist with the reestablishment of trees. A list of District Foresters and District Boundary Map are located on the back page.

KANSAS FOREST SERVICE

MEMORANDUM

To: EIA Permit Applicant

From: Kansas State Historical Society
Bob Hoard, State Archeologist

Re: Historic and Prehistoric Cultural Resources

Because of time and budget constraints, the Kansas State Historical Society has elected to waive review of permit applications under the Water Projects Environmental Coordination Act (KSA 82a-325 *et seq*). However, digging, grading, and other types of construction activities may reveal the presence of buried historic and/or prehistoric archeological sites or artifacts within your project area. If archeological materials are encountered during construction, please contact me at 785-272-8681 ex. 268 or by email at rhoard@kshs.org and do not further disturb the site. If the materials appear to be significant, we may ask for the opportunity to document or salvage them.

In the event human burials or remains are encountered, the Kansas Unmarked Burial Sites Preservation Act (KSA 75-2741 through 75-2754) requires the finder to immediately report these discoveries to the local law enforcement agency. If the remains are not the result of criminal activity, their fate will be determined by the Unmarked Burial Sites Preservation Board. Encountering an unmarked burial does not necessarily stop a project. Discussion with the Board may lead to modification of the project, and in some cases the burial is removed and the project allowed to proceed. Human burials and associated artifacts must not be further disturbed after their discovery, until law enforcement officials or the Unmarked Burial Sites Preservation Board has determined appropriate action. The Unmarked Burial Sites Preservation Act provides substantial penalties for intentionally disturbing human burials and grave goods, whether located on public or private property. If you find a bone that you suspect may be human, leave it where it is and get expert help to identify it. The county coroner, a medical doctor, or an archeologist can help.

What To Look For

Archeological sites from the historic and prehistoric periods may be buried. Prehistoric sites can be recognized by the presence of discolored earth, bones, stone tools (arrow heads, knives, scrapers), stone flakes (thin, sharp-edged pieces of stone produced when making chipped stone tools), burned stones, and pieces of coarse, unglazed pottery. Stone flakes are the most commonly found artifact.

Historic period sites can be recognized by the presence of stone, brick, or concrete foundation walls, or concentrations of these materials. Many of the items used in historic times are similar to those used today. Bottles, cups, "tin" cans, buckets, hand tools, glass fragments, and other items can be easily recognized. If you are unsure of the significance of what you have found, contact my office.

Thank you for assisting us in preserving the archeological heritage of Kansas.

These actions do not constitute compliance with Section 106 of the National Historic Preservation Act. If this project receives Federal funding, licensing, permitting, or assistance you must contact the State Historic Preservation Office (785-272-8681 ex. 240) prior to construction for a review of the undertaking under Federal law.

KANSAS STATE HISTORICAL SOCIETY

Cultural Resources Division

6425 S.W. 6th Avenue
Topeka, Kansas
66615-1099
PHONE# (785) 272-8681
FAX# (785) 272-8682
TTY# (785) 272-8683

THE STATE OF KANSAS

KANSAS DEPARTMENT OF AGRICULTURE
[redacted]
ADRIAN J. POLANSKY, SECRETARY

DIVISION OF WATER RESOURCES
David L. Pope, Chief Engineer

PERMIT NO. CSG-0224

K.S.A. 82a-301 *et seq.*

The Chief Engineer of the Division of Water Resources, Kansas Department of Agriculture, by virtue of the powers and duties imposed by K.S.A. 82a-301 to 305a, hereby issues this permit to Heights, L.L.C., giving his consent to the construction of a channel change, consisting of three detention ponds, one of which employs two weirs as controls in, along and across Middle Fork Chisholm Creek at a location in the S ½ of the NE 1/4 and in the SE 1/4, all in Section 22, Township 26 South, Range 1 East, Sedgwick County, Kansas .

All work authorized by this permit shall be performed in accordance with the maps, plans, profiles and specifications filed with the application and approved by the Chief Engineer, and in accordance with plans for any changes or modifications subsequently approved by the Chief Engineer subject to the provisions of the aforementioned statutes, their regulations and the attached permit conditions.

Witness my hand this 22nd day of June, 2004

DIVISION OF WATER RESOURCES
DAVID L. POPE
CHIEF ENGINEER
KANSAS DEPARTMENT of AGRICULTURE

David L. Pope, P.E.
Chief Engineer
Division of Water Resources
Kansas Department of Agriculture

State of Kansas)
) ss
County of Shawnee)

The foregoing instrument was acknowledged before me this 22nd day of June, 2004, by David L. Pope, Chief Engineer, Division of Water Resources, Kansas Department of Agriculture.

Notary Public

Debra L. Mend
Notary Public
State of Kansa
My Appt. Expires 5/13/

RECORD THIS PERMIT WITH THE REGISTER OF DEEDS OF THE COUNTY WHEREIN THE WORK IS LOCATED

DWR 2-200.0 (Rev. 5/92)

THE STATE OF KANSAS

KANSAS DEPARTMENT OF AGRICULTURE
[redacted]
ADRIAN J. POLANSKY, SECRETARY

DIVISION OF WATER RESOURCES
David L. Pope, Chief Engineer

PERMIT NO. SSG-0456

K.S.A. 82a-301 *et seq.*

The Chief Engineer of the Division of Water Resources, Kansas Department of Agriculture, by virtue of the powers and duties imposed by K.S.A. 82a-301 to 305a, hereby issues this permit to Heights, L.L.C., giving his consent to the construction of a double 48 in. pipes outfall structure in Middle Fork Chisholm Creek at a location in the E ½ of the NE 1/4 of the SE 1/4 of Section 22, Township 26 South, Range 1 East, Sedgwick County, Kansas.

All work authorized by this permit shall be performed in accordance with the maps, plans, profiles and specifications filed with the application and approved by the Chief Engineer, and in accordance with plans for any changes or modifications subsequently approved by the Chief Engineer subject to the provisions of the aforementioned statutes, their regulations and the attached permit conditions.

COPY FOR INFORMATION

Witness my hand this 22nd day of June, 2004.

DIVISION OF WATER RESOURCES
DAVID L. POPE
CHIEF ENGINEER
KANSAS DEPARTMENT of AGRICULTURE

David L. Pope, P.E.
Chief Engineer
Division of Water Resources
Kansas Department of Agriculture

State of Kansas)
)SS
County of Shawnee)

The foregoing instrument was acknowledged before me this 22nd day of June, 2004, by David L. Pope, Chief Engineer, Division of Water Resources, Kansas Department of Agriculture.

Notary Public

Debra L. Mendez
Notary Public
State of Kansas
My Appt. Expires 5/13/06

RECORD THIS PERMIT WITH THE REGISTER OF DEEDS OF THE COUNTY WHEREIN THE WORK IS LOCATED

DWR 2-200.0 (Rev. 5/92)

THE STATE OF KANSAS

KANSAS DEPARTMENT OF AGRICULTURE
[redacted]
ADRIAN J. POLANSKY, SECRETARY

DIVISION OF WATER RESOURCES
David L. Pope, Chief Engineer

PERMIT NO. SSG-0457

K.S.A. 82a-301 *et seq.*

The Chief Engineer of the Division of Water Resources, Kansas Department of Agriculture, by virtue of the powers and duties imposed by K.S.A. 82a-301 to 305a, hereby issues this permit to Heights, L.L.C., giving his consent to the construction of an 18 in. pipe outfall structure in Middle Fork Chisholm Creek at a location in the S 1/2 of the SW 1/4 of the SE 1/4 of Section 22, Township 26 South, Range 1 East, Sedgwick County, Kansas.

All work authorized by this permit shall be performed in accordance with the maps, plans, profiles and specifications filed with the application and approved by the Chief Engineer, and in accordance with plans for any changes or modifications subsequently approved by the Chief Engineer subject to the provisions of the aforementioned statutes, their regulations and the attached permit conditions.

Witness my hand this 22nd day of June, 2004

DIVISION OF WATER RESOURCES
DAVID L. POPE
CHIEF ENGINEER
KANSAS DEPARTMENT of AGRICULTURE

David L. Pope, P.E.
Chief Engineer
Division of Water Resources
Kansas Department of Agriculture

State of Kansas)
)SS
County of Shawnee)

The foregoing instrument was acknowledged before me this 22nd day of June, 2004, by David L. Pope, Chief Engineer, Division of Water Resources, Kansas Department of Agriculture.

Debra L. Mendez
Notary Public
State of Kansas

Notary Public

My Appt. Expires 5/13/06

RECORD THIS PERMIT WITH THE REGISTER OF DEEDS OF THE COUNTY WHEREIN THE WORK IS LOCATED

DWR 2-200.0 (Rev. 5/92)

THE STATE OF KANSAS

KANSAS DEPARTMENT OF AGRICULTURE
[redacted]
ADRIAN J. POLANSKY, SECRETARY

DIVISION OF WATER RESOURCES
David L. Pope, Chief Engineer

APPROVAL OF APPLICATION

NO. LSG-0264

K.S.A. *24-126*

The Chief Engineer of the Division of Water Resources, Kansas Department of Agriculture, by virtue of the powers and duties imposed by K.S.A. 24-126, hereby issues this approval to Heights, L.L.C., giving his consent to place fill in, along and across a floodplain of Middle Fork Chisholm Creek at a location in the S ½ of the NE 1/4 and in the SE 1/4, all in Section 22, Township 26 South, Range 1 East, Sedgwick County, Kansas.

All work authorized by this approval shall be performed in accordance with the maps, plans, profiles and specifications filed with the application and approved by the Chief Engineer, and in accordance with plans for any changes or modifications subsequently approved by the Chief Engineer subject to the provisions of the aforementioned statute, its regulations and the attached approval conditions.

Witness my hand this 22nd day of June, 2004

DIVISION OF WATER RESOURCES
DAVID L. POPE
CHIEF ENGINEER
KANSAS DEPARTMENT of AGRICULTURE

David L. Pope, P.E.
Chief Engineer
Division of Water Resources
Kansas Department of Agriculture

State of Kansas)
)SS
County of Shawnee)

The foregoing instrument was acknowledged before me this 22nd day of June, 2004, by David L. Pope, Chief Engineer, Division of Water Resources, Kansas Department of Agriculture.

Debra L. Mende
Notary Public
State of Kansas
My Appt. Expires 5/13/06

Notary Public

RECORD THIS INSTRUMENT IN THE OFFICE OF THE REGISTER OF DEEDS
OF THE COUNTY WHEREIN THE WORK IS LOCATED

Flowmaster StormCad

45th Street Entrance Culvert
Worksheet for Circular Channel

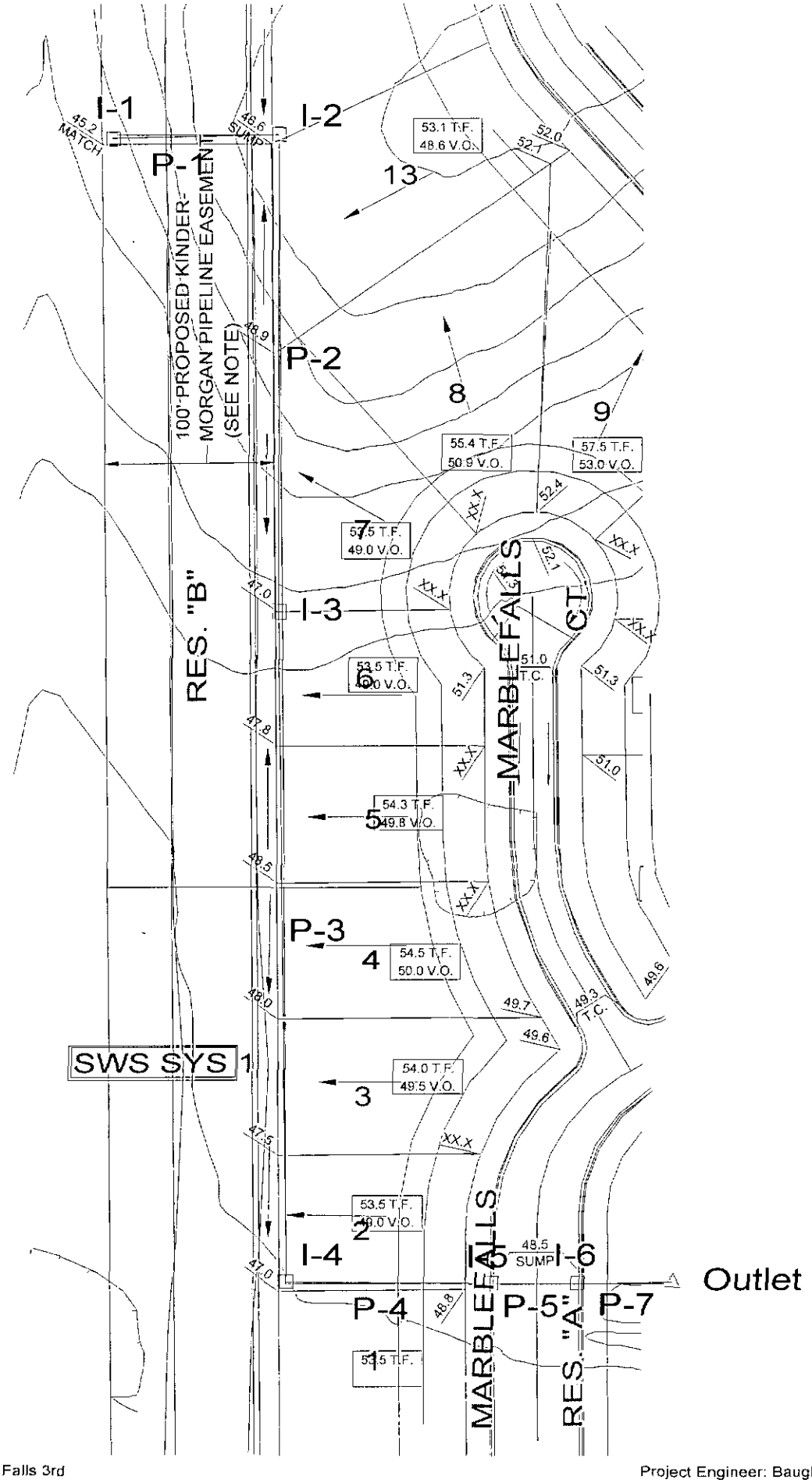
Project Description	
Project File	untitled.fm2
Worksheet	45th Culvert
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Diameter

Input Data		
Mannings Coefficient	0.013	
Channel Slope	1.4000	%
Depth	3.00	ft
Discharge	133.00	cfs

Results		
Diameter	43.71	in
Flow Area	9.18	ft²
Wetted Perimeter	8.29	ft
Top Width	2.78	ft
Critical Depth	3.38	ft
Percent Full	82.35	
Critical Slope	0.012216	ft/ft
Velocity	14.48	ft/s
Velocity Head	3.26	ft
Specific Energy	6.26	ft
Froude Number	1.40	
Maximum Discharge	142.47	cfs
Full Flow Capacity	132.44	cfs
Full Flow Slope	0.014118	ft/ft
Flow is supercritical.		

Flow to culvert : 36 acres
7.37 in/hr
"C" = 0.50

Q = CiA = 133 cfs → 48" RCP



Baughman Company, P.A.
37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

Pipe Report

Upstream Node	Section Size	Downstream Node	Constructed Slope (ft/ft)	Length (ft)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Upstream HGL (ft)	Downstream HGL (ft)	Upstream Cover (ft)	Downstream Cover (ft)	Discharge (cfs)	Roughness	Section Material	Inlet Area (acres)	Weighted Roughness Coefficient
I-1	24 inch	I-2	0.004082	98.00	42.50	42.10	45.20	46.60	43.21	43.20	0.70	2.50	1.90	0.013	Concret	0.00	0.00
I-2	24 inch	I-3	0.002867	279.00	42.10	41.30	46.60	47.00	43.08	42.49	2.50	3.70	5.90	0.013	Concret	0.00	0.00
I-3	30 inch	I-4	0.002792	394.00	41.30	40.20	47.00	47.00	42.36	41.55	3.20	4.30	8.10	0.013	Concret	0.00	0.00
I-4	30 inch	I-5	0.003333	120.00	40.20	39.80	47.00	48.50	41.42	41.32	4.30	6.20	9.60	0.013	Concret	0.00	0.00
I-5	30 inch	I-6	0.003846	52.00	39.80	39.60	48.50	48.50	41.18	41.15	6.20	6.40	11.80	0.013	Concret	0.00	0.00
I-6	30 inch	Outlet	0.003571	56.00	39.60	39.40	48.50	45.00	40.94	40.65	6.40	3.10	13.80	0.013	Concret	0.00	0.00

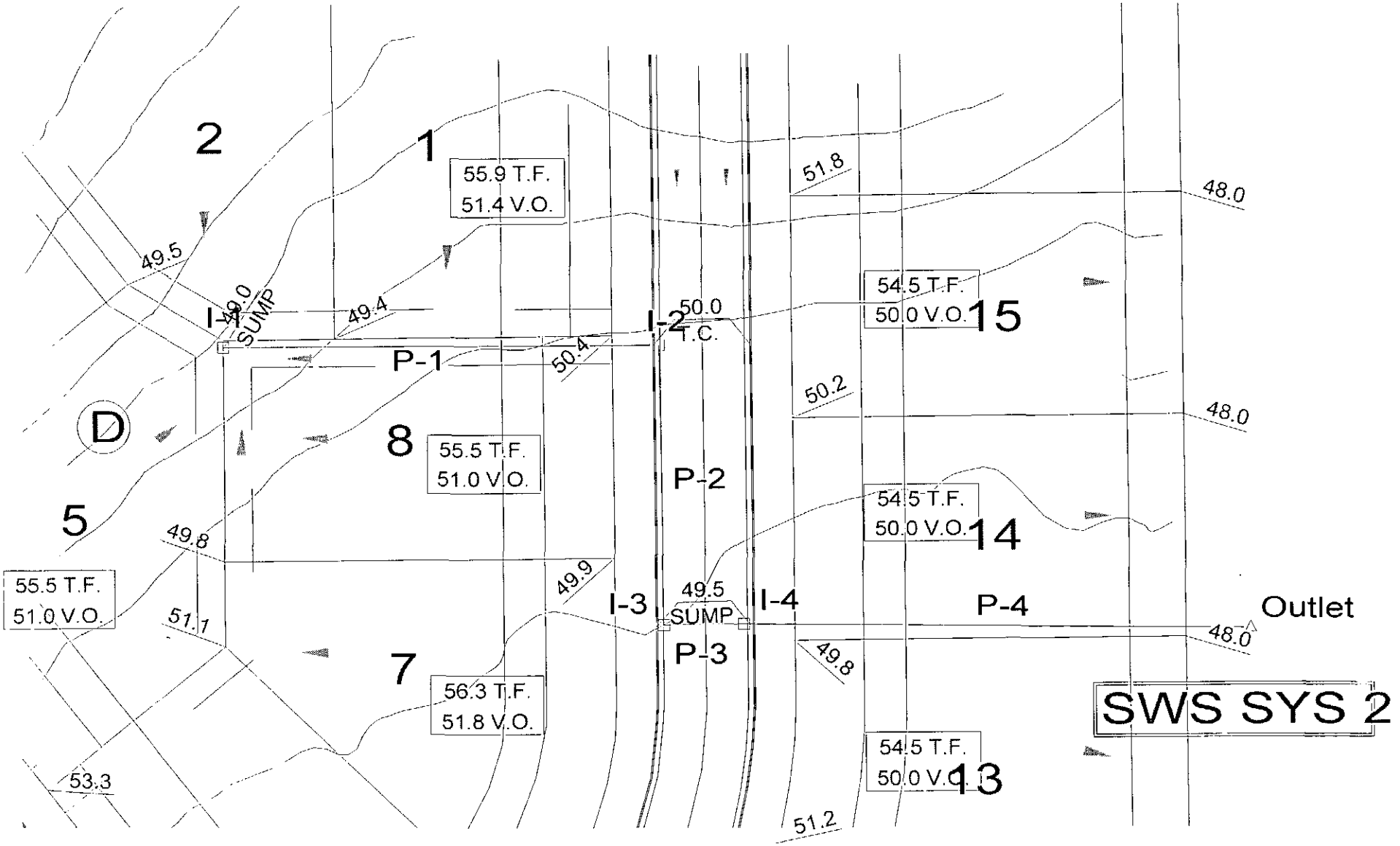
System Report

Pipe	Additional Flow (cfs)	Total Upstream Added (cfs)	Structure Discharge (cfs)	-Node- Upstream Downstream	-Section- Shape Size	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-1	2.80	0.00	2.80	I-1	Circular	42.50	42.10	45.20	43.43	0.000457	2.80	98.00	1.61	
				I-2	24 inch			46.60	43.42	0.004082	14.45			
P-2	5.00	2.80	7.80	I-2	Circular	42.10	41.30	46.60	43.30	0.001970	7.80	279.00	3.47	
				I-3	24 inch			47.00	42.86	0.002867	12.11			
P-3	4.00	7.80	11.80	I-3	Circular	41.30	40.20	47.00	42.73	0.001276	11.80	394.00	3.34	
				I-4	30 inch			47.00	42.38	0.002792	21.67			
P-4	6.20	11.80	18.00	I-4	Circular	40.20	39.80	47.00	42.24	0.001795	18.00	120.00	4.02	
				I-5	30 inch			48.50	42.07	0.003333	23.68			
P-5	3.20	18.00	21.20	I-5	Circular	39.80	39.60	48.50	41.89	0.002505	21.20	52.00	4.75	
				I-6	30 inch			48.50	41.78	0.003846	25.44			
P-7	3.00	21.20	24.20	I-6	Circular	39.60	39.40	48.50	41.50	0.004433	24.20	56.00	6.48	
				Outlet	30 inch			45.00	41.08	0.003571	24.51			

 Baughman Company, P.A.
37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

System Report

Pipe	Additional Flow (cfs)	Total Upstream Added (cfs)	Structure Discharge (cfs)	-Node- Upstream Downstream	-Section- Shape Size	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-1	4.90	0.00	4.90	I-1	Circular	42.50	42.10	45.20	46.33	0.000469	4.90	98.00	1.56	
				I-2	24 inch			46.60	46.29	0.004082	14.45			
P-2	10.00	4.90	14.90	I-2	Circular	42.10	41.30	46.60	46.11	0.004339	14.90	279.00	4.74	
				I-3	24 inch			47.00	44.90	0.002867	12.11			
P-3	6.00	14.90	20.90	I-3	Circular	41.30	40.20	47.00	44.76	0.002597	20.90	394.00	4.26	
				I-4	30 inch			47.00	43.74	0.002792	21.67			
P-4	4.00	20.90	24.90	I-4	Circular	40.20	39.80	47.00	43.54	0.003686	24.90	120.00	5.07	
				I-5	30 inch			48.50	43.10	0.003333	23.68			
P-5	6.00	24.90	30.90	I-5	Circular	39.80	39.60	48.50	42.79	0.005676	30.90	52.00	6.29	
				I-6	30 inch			48.50	42.49	0.003846	25.44			
P-7	5.00	30.90	35.90	I-6	Circular	39.60	39.40	48.50	42.08	0.006824	35.90	56.00	7.86	
				Outlet	30 inch			45.00	41.43	0.003571	24.51			


2
1
55.9 T.F.
51.4 V.O.
51.8
48.0
49.5
I-1
49.0
SUMP
49.4
I-2
50.0
T.C.
54.5 T.F.
50.0 V.O.
15
P-1
50.4
50.2
48.0
D
8
55.5 T.F.
51.0 V.O.
P-2
5
54.5 T.F.
50.0 V.O.
14
49.8
55.5 T.F.
51.0 V.O.
49.9
I-3
49.5
SUMP
I-4
P-4
Outlet
51.1
48.0
P-3
49.8
7
56.3 T.F.
51.8 V.O.
SWS SYS 2
54.5 T.F.
50.0 V.O.
13
53.3
51.2

System Report

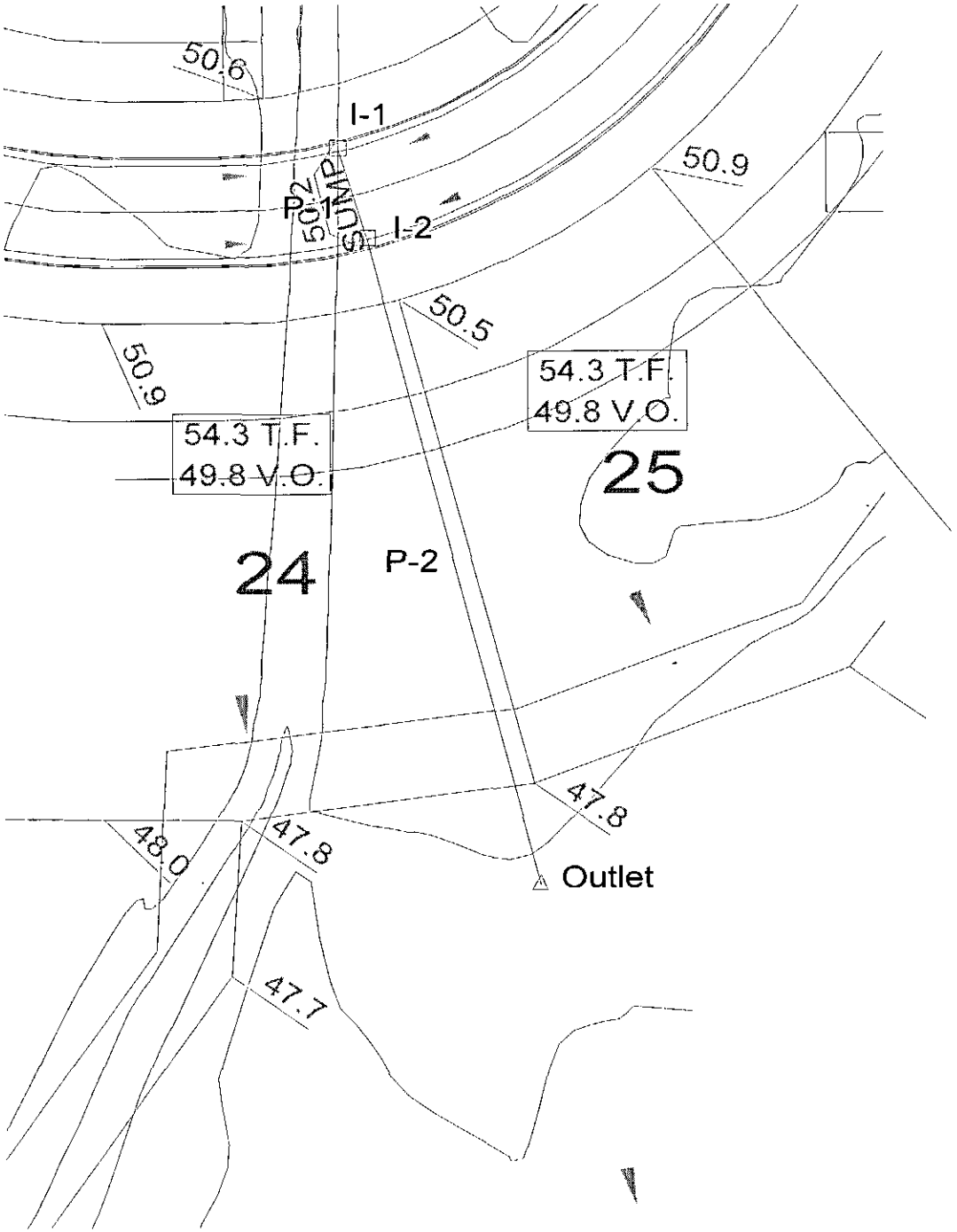
Pipe	Additional Flow (cfs)	Total Upstream Added (cfs)	Structure Discharge (cfs)	-Node- Upstream Downstream	-Section- Shape Size	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-1	2.70	0.00	2.70	I-1	Circular	46.00	45.50	49.00	46.82	0.001158	2.70	157.00	2.24	
				I-2	18 inch			50.00	46.71	0.003185	5.93			
P-2	3.00	2.70	5.70	I-2	Circular	45.50	45.20	50.00	46.63	0.001303	5.70	101.00	2.81	
				I-3	24 inch			49.50	46.55	0.002970	12.33			
P-3	1.50	5.70	7.20	I-3	Circular	45.20	45.00	49.50	46.46	0.001570	7.20	29.00	3.18	
				I-4	24 inch			49.50	46.47	0.006897	18.79			
P-4	1.60	7.20	8.80	I-4	Circular	45.00	44.60	49.50	46.35	0.002793	8.80	181.00	4.56	
				Outlet	24 inch			48.00	45.66	0.002210	10.63			

System Report

Pipe	Additional Flow (cfs)	Total Upstream Added (cfs)	Structure Discharge (cfs)	-Node- Upstream Downstream	-Section- Shape Size	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-1	4.00	0.00	4.00	I-1	Circular	46.00	45.50	49.00	47.49	0.001449	4.00	157.00	2.26	
				I-2	18 inch			50.00	47.27	0.003185	5.93			
P-2	3.50	4.00	7.50	I-2	Circular	45.50	45.20	50.00	47.21	0.000981	7.50	101.00	2.52	
				I-3	24 inch			49.50	47.13	0.002970	12.33			
P-3	3.00	7.50	10.50	I-3	Circular	45.20	45.00	49.50	47.03	0.001955	10.50	29.00	3.41	
				I-4	24 inch			49.50	46.99	0.006897	18.79			
P-4	3.00	10.50	13.50	I-4	Circular	45.00	44.60	49.50	46.84	0.003548	13.50	181.00	5.30	
				Outlet	24 inch			48.00	45.92	0.002210	10.63			

System Report

Pipe	Additional Flow (cfs)	Total Upstream Added (cfs)	Structure Discharge (cfs)	-Node- Upstream Downstream	-Section- Shape Size	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-1	7.00	0.00	7.00	I-1	Circular	46.00	45.50	49.00	50.30	0.004441	7.00	157.00	3.96	
				I-2	18 inch			50.00	49.60	0.003185	5.93			
P-2	5.50	7.00	12.50	I-2	Circular	45.50	45.20	50.00	49.48	0.003053	12.50	101.00	3.98	
				I-3	24 inch			49.50	49.17	0.002970	12.33			
P-3	5.00	12.50	17.50	I-3	Circular	45.20	45.00	49.50	48.93	0.005985	17.50	29.00	5.57	
				I-4	24 inch			49.50	48.75	0.006897	18.79			
P-4	5.50	17.50	23.00	I-4	Circular	45.00	44.60	49.50	48.34	0.010242	23.00	181.00	7.69	
				Outlet	24 inch			48.00	46.31	0.002210	10.63			


50.6
I-1
50.9
P-1
50.2
SUMP
I-2
50.5
50.9
54.3 T.F.
49.8 V.O.
54.3 T.F.
49.8 V.O.
25
24
P-2
47.8
48.0
47.8
Outlet
47.7

System Report

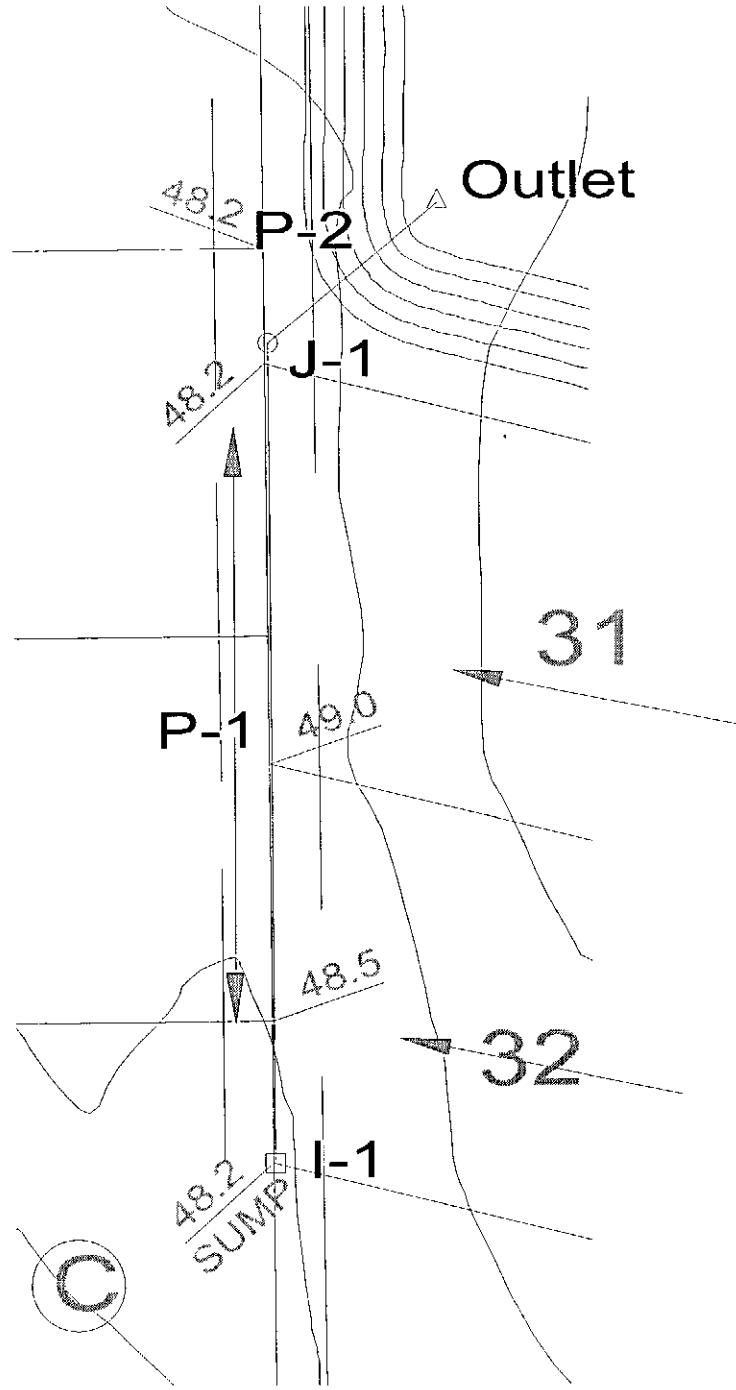
Pipe	Additional Flow (cfs)	Total Upstream Added (cfs)	Structure Discharge (cfs)	-Node- Upstream Downstream	-Section- Shape Size	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-1	3.20	0.00	3.20	I-1	Circular	47.00	46.90	50.20	47.98	0.001455	3.20	25.00	2.51	
				I-2	18 inch			50.20	47.96	0.004000	6.64			
P-2	3.10	3.20	6.30	I-2	Circular	46.90	46.00	50.20	47.79	0.005202	6.30	173.00	4.67	
				Outlet	24 inch			47.80	46.89	0.005202	16.32			

System Report

Pipe	Additional Flow (cfs)	Total Upstream Added (cfs)	Structure Discharge (cfs)	-Node- Upstream Downstream	-Section- Shape Size	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-1	4.60	0.00	4.60	I-1	Circular	47.00	46.90	50.20	48.24	0.001831	4.60	25.00	2.89	
				I-2	18 inch			50.20	48.20	0.004000	6.64			
P-2	4.60	4.60	9.20	I-2	Circular	46.90	46.00	50.20	47.98	0.005202	9.20	173.00	5.30	
				Outlet	24 inch			47.80	47.08	0.005202	16.32			

System Report

Pipe	Additional Flow (cfs)	Total Upstream Added (cfs)	Structure Discharge (cfs)	-Node- Upstream Downstream	-Section- Shape Size	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-1	8.00	0.00	8.00	I-1	Circular	47.00	46.90	50.20	48.92	0.005801	8.00	25.00	4.53	
				I-2	18 inch			50.20	48.78	0.004000	6.64			
P-2	8.00	8.00	16.00	I-2	Circular	46.90	46.00	50.20	48.51	0.005384	16.00	173.00	6.26	
				Outlet	24 inch			47.80	47.44	0.005202	16.32			



Project Title: Falcon Falls 3rd
f:\...\falcon falls 3rd\stormcad\sys4_100.stm
08/15/05 02:36:19 PM

Baughman Company, P.A.
 37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

Project Engineer: Baughman Company, P.A.
StormCAD v1.0

System Report

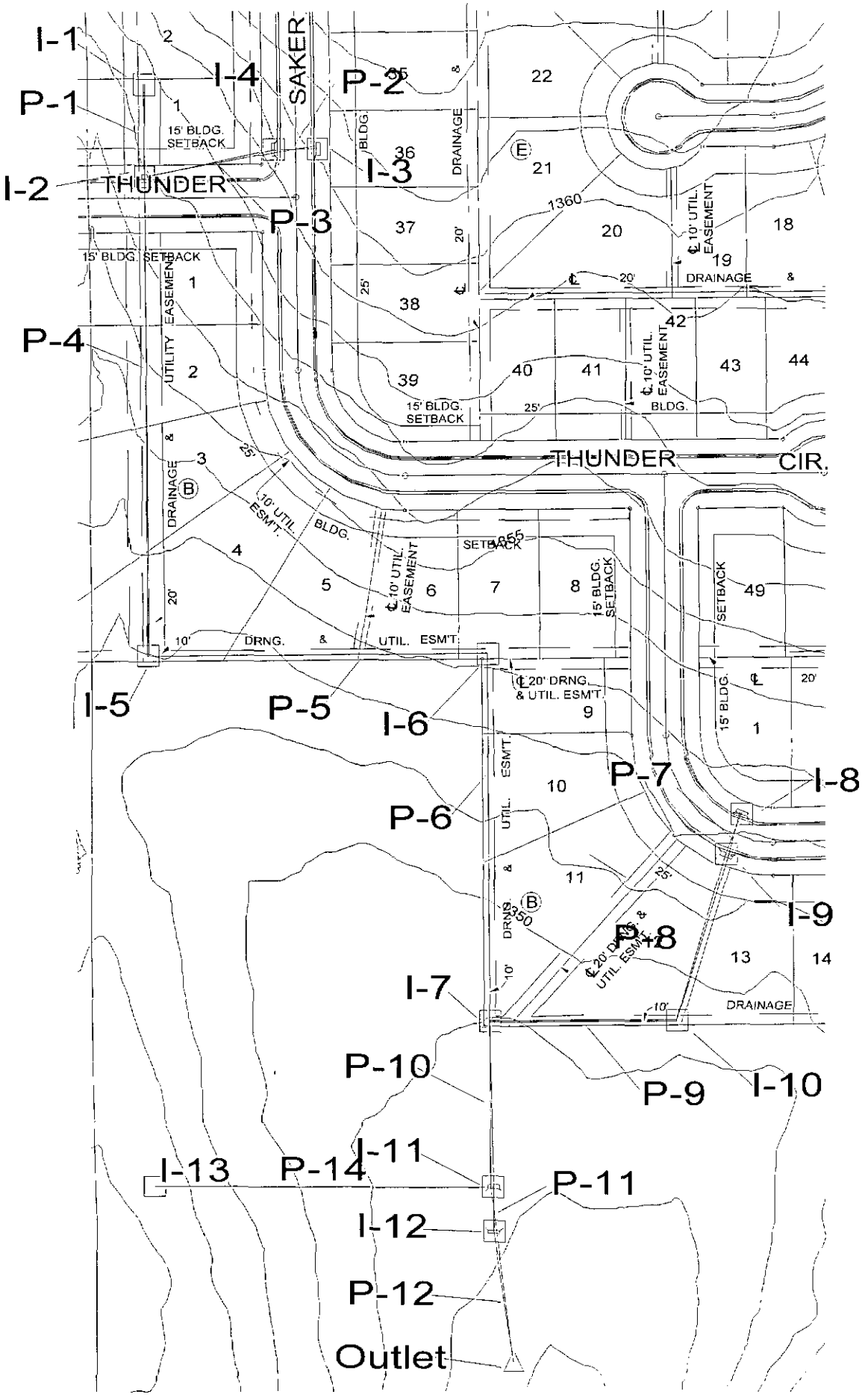
Pipe	Additional Flow (cfs)	Total Upstream Added (cfs)	Structure Discharge (cfs)	-Node- Upstream Downstream	-Section- Shape Size	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-1	3.10	0.00	3.10	I-1	Circular	45.00	44.50	48.20	45.91	0.003395	3.10	169.00	3.78	
				J-1	15 inch			48.20	45.21	0.002959	3.51			
P-2	N/A	3.10	3.10	J-1	Circular	44.20	44.10	48.20	45.01	0.003183	3.10	45.00	3.61	
				Outlet	18 inch			44.00	44.77	0.002222	4.95			

System Report

Pipe	Additional Flow (cfs)	Total Upstream Added (cfs)	Structure Discharge (cfs)	-Node- Upstream Downstream	-Section- Shape Size	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-1	4.50	0.00	4.50	I-1	Circular	45.00	44.50	48.20	46.33	0.004677	4.50	169.00	4.33	
				J-1	15 inch			48.20	45.36	0.002959	3.51			
P-2	N/A	4.50	4.50	J-1	Circular	44.20	44.10	48.20	45.20	0.003567	4.50	45.00	4.09	
				Outlet	18 inch			44.00	44.91	0.002222	4.95			

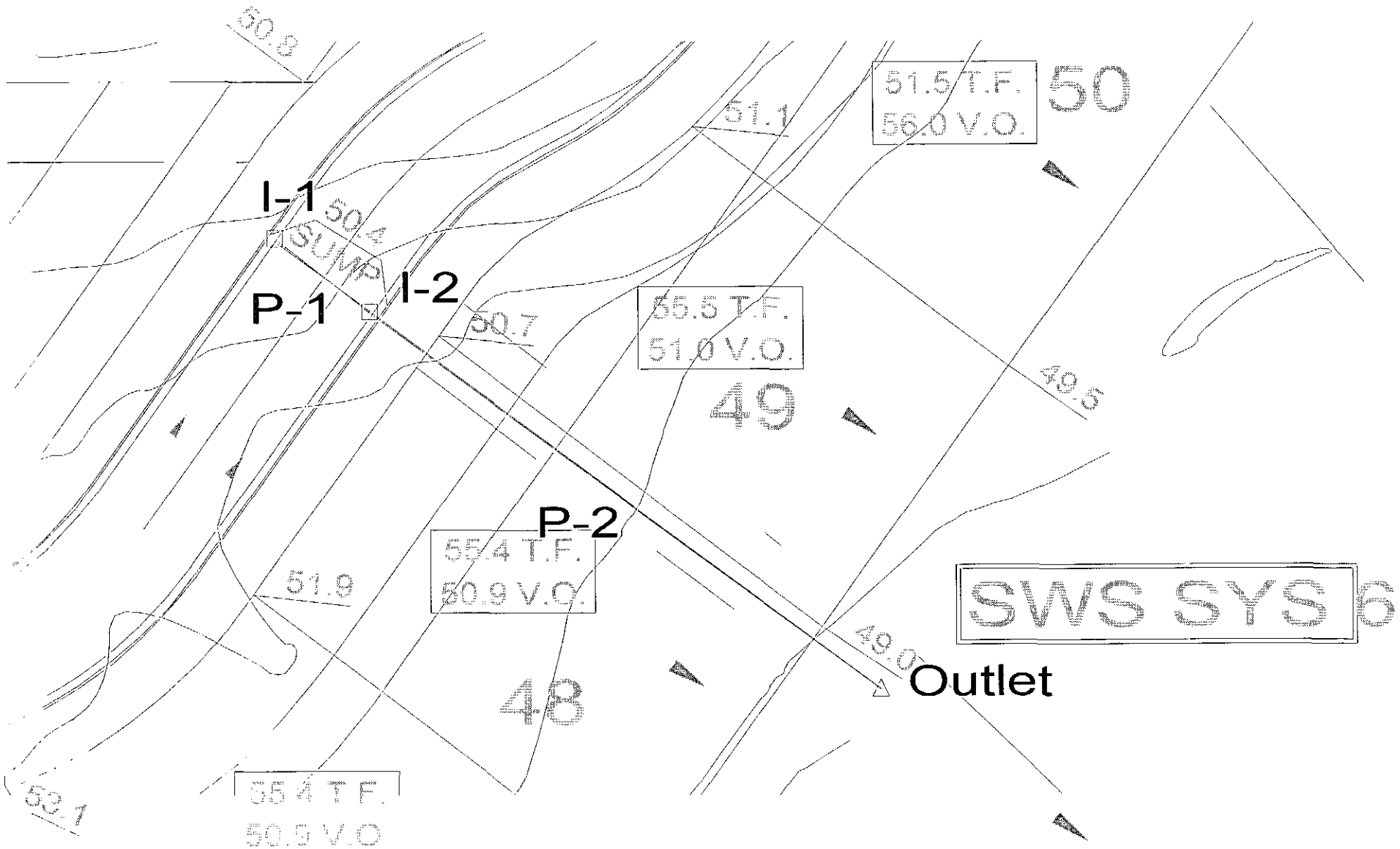
System Report

Pipe	Additional Flow (cfs)	Total Upstream Added (cfs)	Structure Discharge (cfs)	-Node- Upstream Downstream	-Section- Shape Size	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-1	7.90	0.00	7.90	I-1	Circular	45.00	44.50	48.20	48.31	0.014958	7.90	169.00	6.44	
				J-1	15 inch			48.20	45.78	0.002959	3.51			
P-2	N/A	7.90	7.90	J-1	Circular	44.20	44.10	48.20	45.62	0.005312	7.90	45.00	5.16	
				Outlet	18 inch			44.00	45.19	0.002222	4.95			



System Report

Pipe	Additional Flow (cfs)	Total Upstream Added (cfs)	Structure Discharge (cfs)	-Node- Upstream Downstream	-Section- Shape Size	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-14	14.00	0.00	14.00	I-13	Circular	1,345.00	1,342.00	1,351.00	1,348.58	0.003866	14.00	319.00	4.46	
				I-11	24 inch			1,349.10	1,347.35	0.009317	21.83			
P-7	14.50	0.00	14.50	I-8	Circular	1,348.50	1,348.30	1,352.80	1,351.63	0.004109	14.50	41.00	4.62	
				I-9	24 inch			1,352.80	1,351.46	0.004878	15.80			
P-8	15.50	14.50	30.00	I-9	Circular	1,347.80	1,343.20	1,352.80	1,350.75	0.017588	30.00	162.00	9.55	
				I-10	24 inch			1,347.90	1,347.90	0.028395	38.12			
P-9	10.00	30.00	40.00	I-10	Circular	1,343.10	1,342.80	1,347.90	1,348.33	0.003597	40.00	176.00	5.66	
				I-7	36 inch			1,347.70	1,347.70	0.001705	27.54			
P-2	8.20	0.00	8.20	I-3	Circular	1,358.50	1,358.30	1,362.00	1,362.17	0.006094	8.20	41.00	4.64	
				I-4	18 inch			1,362.00	1,361.92	0.004878	7.34			
P-3	3.00	8.20	11.20	I-4	Circular	1,357.50	1,352.40	1,362.00	1,361.61	0.011370	11.20	124.00	6.34	
				I-2	18 inch			1,360.20	1,360.20	0.041129	21.30			
P-1	4.90	0.00	4.90	I-1	Circular	1,353.40	1,353.00	1,357.00	1,360.69	0.005754	4.90	86.00	3.99	
				I-2	15 inch			1,360.20	1,360.20	0.004651	4.41			
P-4	0.50	16.10	16.60	I-2	Circular	1,352.20	1,346.70	1,360.20	1,360.79	0.024976	16.60	449.00	9.39	
				I-5	18 inch			1,350.70	1,349.58	0.012249	11.63			
P-5	6.90	16.60	23.50	I-5	Circular	1,346.20	1,345.70	1,350.70	1,349.40	0.003283	23.50	319.00	4.79	
				I-6	30 inch			1,351.70	1,348.35	0.001567	16.24			
P-6	3.50	23.50	27.00	I-6	Circular	1,345.60	1,342.80	1,351.70	1,348.22	0.001620	27.00	344.00	3.97	
				I-7	36 inch			1,347.70	1,347.70	0.008140	60.17			
P-10	9.90	67.00	76.90	I-7	Circular	1,342.60	1,342.30	1,347.70	1,347.80	0.002866	76.90	156.00	6.12	
				I-11	48 inch			1,349.10	1,347.35	0.001923	62.99			
P-11	16.00	90.90	106.90	I-11	Circular	1,342.00	1,341.80	1,349.10	1,346.79	0.005539	106.90	41.00	8.51	
				I-12	48 inch			1,349.10	1,346.56	0.004878	100.32			
P-12	12.00	106.90	118.90	I-12	Circular	1,341.70	1,338.00	1,349.10	1,345.86	0.006852	118.90	126.00	9.46	
				Outlet	48 inch			1,347.00	1,345.00	0.029365	246.14			


50.8
I-1
50.4
SUMP
P-1
I-2
50.7
51.1
51.5 T.F.
56.0 V.O.
50
55.5 T.F.
51.0 V.O.
49
49.5
P-2
55.4 T.F.
50.9 V.O.
51.9
48.0
48
SWS SYS 6
Outlet
53.1
55.4 T.F.
50.5 V.O.

System Report

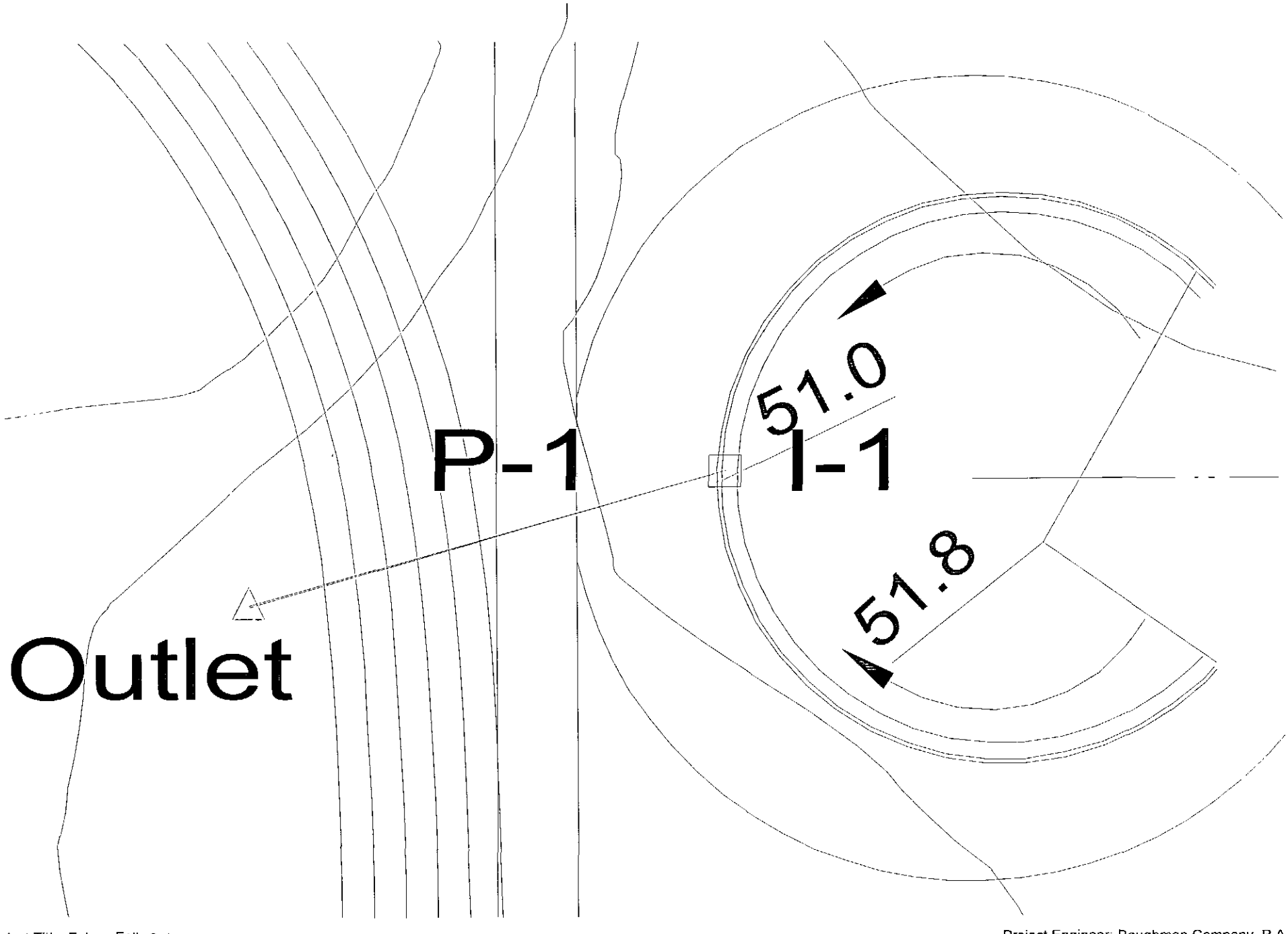
Pipe	Additional Flow (cfs)	Total Upstream *Added* (cfs)	Structure Discharge *(cfs)*	-Node- Upstream *Downstream*	-Section- Shape *Size*	Upstream Invert *Elevation* (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-1	2.20	0.00	2.20	I-1	Circular	47.00	46.80	50.40	47.88	0.001312	2.20	30.00	2.17	
				I-2	15 inch			50.40	47.87	0.006667	5.27			
P-2	2.20	2.20	4.40	I-2	Circular	46.80	46.30	50.40	47.77	0.003439	4.40	159.00	4.11	
				Outlet	18 inch			49.00	47.10	0.003145	5.89			

System Report

Pipe	Additional Flow (cfs)	Total Upstream *Added* (cfs)	Structure Discharge (cfs)	-Node- Upstream *Downstream*	-Section- Shape *Size*	Upstream Invert *Elevation* (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-1	3.30	0.00	3.30	I-1	Circular	47.00	46.80	50.40	48.33	0.002610	3.30	30.00	2.69	
				I-2	15 inch			50.40	48.25	0.006667	5.27			
P-2	3.30	3.30	6.60	I-2	Circular	46.80	46.30	50.40	48.12	0.004025	6.60	159.00	4.65	
				Outlet	18 inch			49.00	47.29	0.003145	5.89			

System Report

Pipe	Additional Flow (cfs)	Total Upstream Added (cfs)	Structure Discharge (cfs)	-Node- Upstream Downstream	-Section- Shape Size	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-1	5.50	0.00	5.50	I-1	Circular	47.00	46.80	50.40	49.95	0.007250	5.50	30.00	4.48	
				I-2	15 inch			50.40	49.74	0.006667	5.27			
P-2	5.50	5.50	11.00	I-2	Circular	46.80	46.30	50.40	49.43	0.010871	11.00	159.00	6.56	
				Outlet	18 inch			49.00	47.57	0.003145	5.89			


P-1
I-1
51.0
51.8
Outlet

System Report

Pipe	Additional Flow (cfs)	Total Upstream Added (cfs)	Structure Discharge (cfs)	-Node- Upstream Downstream	-Section- Shape Size	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-1	2.90	0.00	2.90	I-1	Circular	48.00	47.70	51.00	48.73	0.004993	2.90	61.00	4.07	
				Outlet	15 inch			48.00	48.38	0.004918	4.53			

Baughman Company, P.A.
37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

System Report

Pipe	Additional Flow (cfs)	Total Upstream Added (cfs)	Structure Discharge (cfs)	-Node- Upstream Downstream	-Section- Shape Size	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-1	4.20	0.00	4.20	I-1	Circular	48.00	47.70	51.00	48.94	0.005331	4.20	61.00	4.54	
				Outlet	15 inch			48.00	48.53	0.004918	4.53			

System Report

Pipe	Additional Flow (cfs)	Total Upstream Added (cfs)	Structure Discharge (cfs)	-Node- Upstream Downstream	-Section- Shape Size	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	Length (ft)	Average Velocity (ft/s)	Description
P-1	7.40	0.00	7.40	I-1	Circular	48.00	47.70	51.00	49.67	0.012917	7.40	61.00	6.29	
				Outlet	15 inch			48.00	48.78	0.004918	4.53			

FIS Profiles

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (FEET NGVD)	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE (FEET)
MIDDLE FORK CHISHOLM CREEK								
G	3.08	938	4788	1.3	1345.3	1345.3	1346.0	0.7
H	3.59	330	1185	5.2	1346.6	1346.6	1347.4	0.8
I	3.81	398	2325	2.7	1350.1	1350.1	1350.9	0.8
J	4.14	140	992	5.4	1351.4	1351.4	1352.3	0.9
K	4.29	195	1444	3.7	1353.3	1353.3	1354.0	0.7
L	4.80	117	894	6.0	1357.1	1357.1	1358.0	0.9
M	5.06	128	988	5.4	1360.0	1360.0	1360.9	0.9
EAST FORK CHISHOLM CREEK								
AF	8475[2]	400	1389	2.9	1357.5	1357.5	1358.4	0.9
AP	21,018[2]	400	2376	0.7	1377.0	1377.0	1377.9	0.9
AQ	21,948[2]	36	227	6.8	1377.2	1377.2	1377.9	0.7
AR	23,558[2]	175	519	3.0	1379.8	1379.8	1380.6	0.8
AS	24,728[2]	300	298	5.2	1388.6	1388.6	1388.8	0.2
AT	25,578[2]	204	467	3.3	1389.3	1389.3	1389.7	0.4
AU	27,068[2]	150	287	5.4	1395.3	1395.3	1395.5	0.2
AV	28,430[2]	166	330	4.7	1403.4	1403.4	1403.5	0.1

[1]MILES ABOVE MOUTH
[2]FEET ABOVE OLIVER STREET

TABLE 3

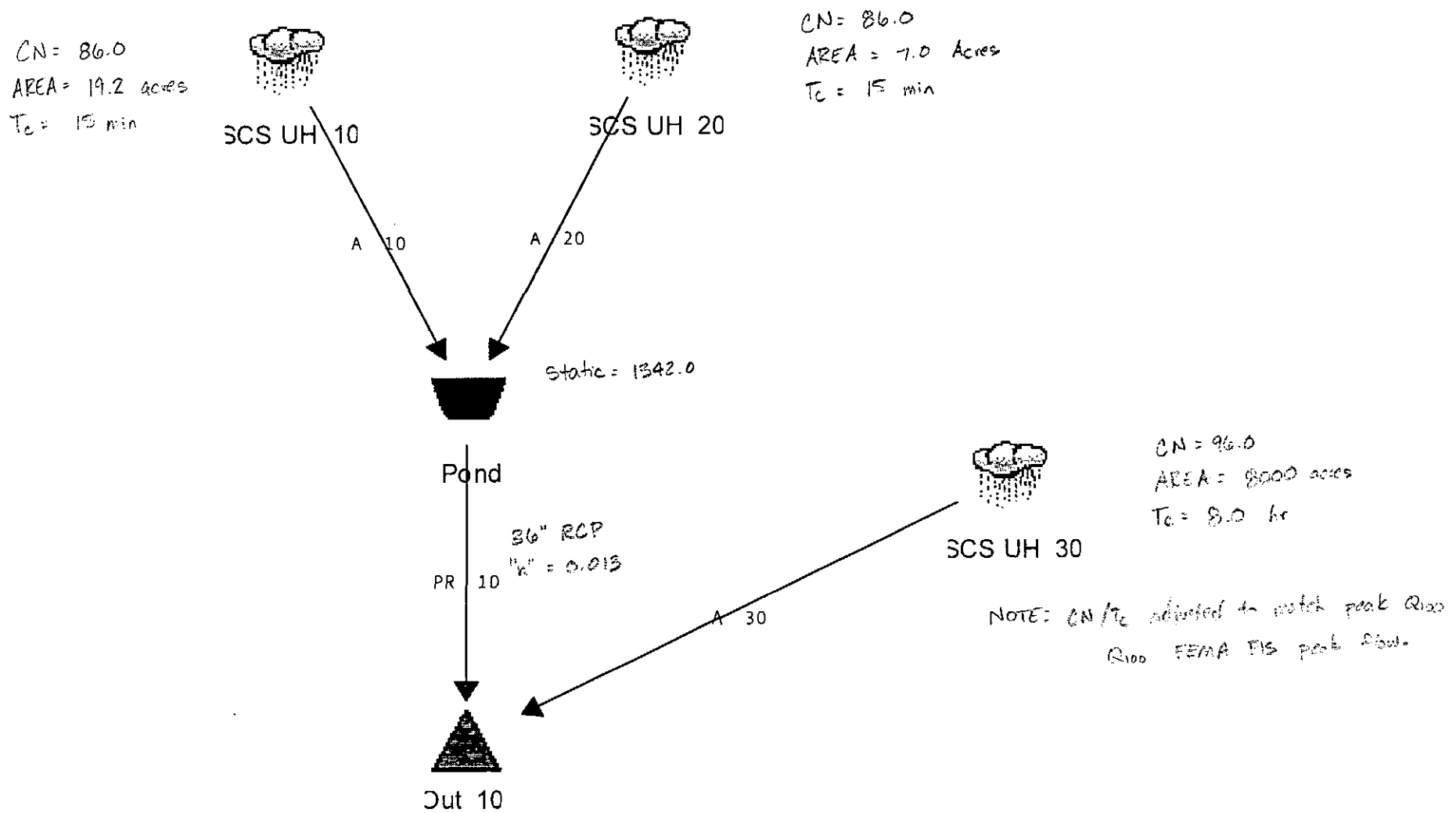
FEDERAL EMERGENCY MANAGEMENT AGENCY

SEDGWICK COUNTY, KS
(UNINCORPORATED AREAS)

FLOODWAY DATA

MIDDLE FORK CHISHOLM CREEK — EAST FORK CHISHOLM CREEK

PondPack


CN = 86.0
AREA = 19.2 acres
Tc = 15 min
SCS UH 10
SCS UH 20
CN = 86.0
AREA = 7.0 Acres
Tc = 15 min
A 10
A 20
Static = 1342.0
Pond
36" RCP
"n" = 0.013
PR 10
SCS UH 30
CN = 96.0
AREA = 8000 acres
Tc = 8.0 hr
A 30
NOTE: CN/Tc adjusted to match peak Q100
Q100 FEMA FIS peak flow.
Out 10

Job File: F:\HYDRO\PROJECTS\FALCON FALLS 3RD\FALCON FALLS 3RD.PPW
Rain Dir: C:\HAESTAD\PPKW\RAINFALL\

==========
JOB TITLE
==========

JOB TITLE NOT SPECIFIED
Click Project Summary on the File Menu to enter title

Table of Contents

********** MASTER SUMMARY **********

Watershed..... Master Network Summary 1.01

********** DESIGN STORMS SUMMARY **********

Sedgwick24..... Design Storms 2.01

Sedgwick24..... 5y24h
Design Storms 2.02

********** RUNOFF HYDROGRAPHS **********

SCS Unit Hyd. Equations 3.01

SCS UH 10..... 2y24h
SCS Unit Hyd. Summary 3.03

SCS UH 10..... 5y24h
SCS Unit Hyd. Summary 3.04

SCS UH 10..... 100y24
SCS Unit Hyd. Summary 3.05

SCS UH 20..... 2y24h
SCS Unit Hyd. Summary 3.06

SCS UH 20..... 5y24h
SCS Unit Hyd. Summary 3.07

SCS UH 20..... 100y24
SCS Unit Hyd. Summary 3.08

SCS UH 30..... 2y24h
SCS Unit Hyd. Summary 3.09

Table of Contents (continued)

SCS UH 30..... 5y24h
SCS Unit Hyd. Summary 3.10

SCS UH 30..... 100y24
SCS Unit Hyd. Summary 3.11

********** TIME VS.VOL **********

POND..... 2y24h
Time vs. Volume 4.01

POND..... 5y24h
Time vs. Volume 4.05

POND..... 100y24
Time vs. Volume 4.09

********** POND VOLUMES **********

POND..... Vol: Elev-Area 5.01

********** POND ROUTING **********

OUT 10..... Elev-Flow 6.01

MASTER DESIGN STORM SUMMARY

Default Network Design Storm File, ID SEDGWICK.RNQ Sedgwick24

Return Event	Total Depth in	Rainfall Type	RNF File	RNF ID
5y24h	4.5000	Synthetic Curve	SCSTYPES	TypeII 24hr
100y24	7.9000	Synthetic Curve	SCSTYPES	TypeII 24hr
2y24h	3.5000	Synthetic Curve	SCSTYPES	TypeII 24hr

ICPM CALCULATION TOLERANCES

Target Convergence= .000 cfs +/-
Max. Iterations = 35 loops
ICPM Time Step = .0500 hrs
Output Time Step = .0500 hrs
ICPM Ending Time = 35.0000 hrs

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Storage Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond ac-ft
*OUT 10	E-Q	5	2682.015		17.0500	3395.46	1342.76	
*OUT 10	E-Q	100	4934.355		17.0500	6138.02	1345.05	
*OUT 10	E-Q	2	2023.023		17.0500	2580.83	1341.25	
POND	POND	5	6.557		12.0500	93.82		
POND	POND	100	13.612		12.0500	187.88		
POND	POND	2	4.581		12.0500	66.27		
POND	OUT POND	5	6.172		12.5500	12.77	1343.73	3.395
POND	OUT POND	100	14.247		12.4000	36.51	1345.24	6.710
POND	OUT POND	2	4.242		12.7000	7.09	1343.25	2.410
SCS UH 10	AREA	5	4.805		12.0500	68.75		
SCS UH 10	AREA	100	9.975		12.0500	137.69		
SCS UH 10	AREA	2	3.357		12.0500	48.57		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Storage Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond ac-ft
SCS UH 20	AREA	5	1.752		12.0500	25.07		
SCS UH 20	AREA	100	3.637		12.0500	50.20		
SCS UH 20	AREA	2	1.224		12.0500	17.71		
SCS UH 30	AREA	5	2690.643		17.0500	3392.15		
SCS UH 30	AREA	100	4947.442		17.0500	6141.22		
SCS UH 30	AREA	2	2030.216		17.0500	2577.30		

File.... C:\HAESTAD\PPKW\RAINFALL\SEDGWICK.RNQ
Title...

JOB TITLE NOT SPECIFIED
Click Project Summary on the File Menu to enter title

DESIGN STORMS SUMMARY

Design Storm File,ID = SEDGWICK.RNQ Sedgwick24

Storm Tag Name = 5y24h
Description: Sedgwick County 5-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 5 yr
Total Rainfall Depth= 4.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 100y24
Description: Sedgwick County 100-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 100 yr
Total Rainfall Depth= 7.9000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 2y24h
Description: Sedgwick County 2-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 2 yr
Total Rainfall Depth= 3.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

DESIGN STORMS SUMMARY

Design Storm File,ID = SEDGWICK.RNQ Sedgwick24

Storm Tag Name   = 5y24h
Description: Sedgwick County 5-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency   = 5 yr
Total Rainfall Depth= 4.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name   = 100y24
Description: Sedgwick County 100-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency   = 100 yr
Total Rainfall Depth= 7.9000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name   = 2y24h
Description: Sedgwick County 2-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency   = 2 yr
Total Rainfall Depth= 3.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

SCS UNIT HYDROGRAPH METHOD
(Computational Notes)

DEFINITION OF TERMS: ----------

At = Total area (acres): At = Ai+Ap
Ai = Impervious area (acres)
Ap = Pervious area (acres)
CNi = Runoff curve number for impervious area
CNp = Runoff curve number for pervious area
fLoss = f loss constant infiltration (depth/time)
dt = Computational increment (duration of unit excess rainfall)
Default dt is smallest value of 0.1333Tc, rtm, and th
(Smallest dt is then adjusted to match up with Tp)
UDdt = User specified override computational main time increment
(only used if UDdt is => .1333Tc)
D(t) = Point on distribution curve (fraction of P) for time step t

K = 2 / (1 + (Tr/Tp)): default K = 0.75: (for Tr/Tp = 1.67)
Ks = Hydrograph shape factor
= Unit Conversions * K:
= ((1hr/3600sec) * (1ft/12in) * ((5280ft)**2/sq.mi)) * K
Default Ks = 645.333 * 0.75 = 484

Lag = Lag time from center of excess runoff (dt) to Tp: Lag = 0.6Tc
P = Total precipitation depth, inches
Pa(t) = Accumulated rainfall at time step t
Pi(t) = Incremental rainfall at time step t
qp = Peak discharge (cfs) for 1in. runoff, for 1hr, for 1 sq.mi.
= (Ks * A * Q) / Tp (where Q = 1in. runoff, A=sq.mi.)
Qu(t) = Unit hydrograph ordinate (cfs) at time step t
Q(t) = Final hydrograph ordinate (cfs) at time step t
Rai(t)= Accumulated runoff (inches) at time step t for impervious area
Rap(t)= Accumulated runoff (inches) at time step t for pervious area
Rii(t)= Incremental runoff (inches) at time step t for impervious area
Rip(t)= Incremental runoff (inches) at time step t for pervious area
R(t) = Incremental weighted total runoff (inches)
Rtm = Time increment for rainfall table (.RNF file)
Si = S for impervious area: Si = (1000/CNi) - 10
Sp = S for pervious area: Sp = (1000/CNp) - 10
t = Time step (row) number
Tc = Time of concentration
Tb = Time (hrs) of entire unit hydrograph: Tb = Tp + Tr
Tp = Time (hrs) to peak of a unit hydrograph: Tp = (dt/2) + Lag
Tr = Time (hrs) of receding limb of unit hydrograph: Tr = ratio of Tp

SCS UNIT HYDROGRAPH METHOD
(Computational Notes)

PRECIPITATION: ----------
Column (1): Time for time step t
Column (2): D(t) = Point on distribution curve for time step t
Column (3): Pi(t) = Pa(t) - Pa(t-1): Col.(4) - Preceding Col.(4)
Column (4): Pa(t) = D(t) x P: Col.(2) x P

PERVIOUS AREA RUNOFF (using SCS Runoff CN Method) ----------
Column (5): Rap(t) = Accumulated pervious runoff for time step t
If (Pa(t) is <= 0.2Sp) then use: Rap(t) = 0.0
If (Pa(t) is > 0.2Sp) then use:

Rap(t) = (Col.(4)-0.2Sp)**2 / (Col.(4)+0.8Sp)

Column (6): Rip(t) = Incremental pervious runoff for time step t
Rip(t) = Rap(t) - Rap(t-1)
Rip(t) = Col.(5) for current row - Col.(5) for preceding row.

IMPERVIOUS AREA RUNOFF ----------
Column (7 & 8)... Did not specify to use impervious areas.

INCREMENTAL WEIGHTED RUNOFF: ----------
Column (9): R(t) = (Ap/At) x Rip(t) + (Ai/At) x Rii(t)
R(t) = (Ap/At) x Col.(6) + (Ai/At) x Col.(8)

SCS UNIT HYDROGRAPH METHOD: ----------
Column (10): Q(t) is computed with the SCS unit hydrograph method
using R() and Qu().

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = 3.5000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = F:\HYDRO\PROJECTS\FALCON FALLS 3RD\
HYG File - ID = - SCS UH 10 2y24h
Tc = .2500 hrs
Drainage Area = 19.200 acres Runoff CN= 86

==========
Computational Time Increment = .03333 hrs
Computed Peak Time = 12.0333 hrs
Computed Peak Flow = 48.96 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0500 hrs
Peak Flow, Interpolated Output = 48.57 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 86
Area = 19.200 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

2.0983 in
3.357 ac-ft

HYG Volume... 3.357 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .25000 hrs (ID: None Selected)
Computational Incr, Tm = .03333 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 87.02 cfs
Unit peak time Tp = .16667 hrs
Unit receding limb, Tr = .66667 hrs
Total unit time, Tb = .83333 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 5 year storm
Duration = 24.0000 hrs Rain Depth = 4.5000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = F:\HYDRO\PROJECTS\FALCON FALLS 3RD\
HYG File - ID = - SCS UH 10 5y24h
Tc = .2500 hrs
Drainage Area = 19.200 acres Runoff CN= 86

==========
Computational Time Increment = .03333 hrs
Computed Peak Time = 12.0333 hrs
Computed Peak Flow = 69.48 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0500 hrs
Peak Flow, Interpolated Output = 68.75 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 86
Area = 19.200 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

3.0032 in
4.805 ac-ft

HYG Volume... 4.805 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .25000 hrs (ID: None Selected)
Computational Incr, Tm = .03333 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 87.02 cfs
Unit peak time Tp = .16667 hrs
Unit receding limb, Tr = .66667 hrs
Total unit time, Tb = .83333 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 7.9000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = F:\HYDRO\PROJECTS\FALCON FALLS 3RD\
HYG File - ID = - SCS UH 10 100y24
Tc = .2500 hrs
Drainage Area = 19.200 acres Runoff CN= 86

==========
Computational Time Increment = .03333 hrs
Computed Peak Time = 12.0333 hrs
Computed Peak Flow = 139.65 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0500 hrs
Peak Flow, Interpolated Output = 137.69 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 86
Area = 19.200 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

6.2345 in
9.975 ac-ft

HYG Volume... 9.975 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .25000 hrs (ID: None Selected)
Computational Incr, Tm = .03333 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 87.02 cfs
Unit peak time Tp = .16667 hrs
Unit receding limb, Tr = .66667 hrs
Total unit time, Tb = .83333 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = 3.5000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = F:\HYDRO\PROJECTS\FALCON FALLS 3RD\
HYG File - ID = - SCS UH 20 2y24h
Tc = .2500 hrs
Drainage Area = 7.000 acres Runoff CN= 86

==========

Computational Time Increment	=	.03333 hrs
Computed Peak Time	=	12.0333 hrs
Computed Peak Flow	=	17.85 cfs
Time Increment for HYG File	=	.0500 hrs
Peak Time, Interpolated Output	=	12.0500 hrs
Peak Flow, Interpolated Output	=	17.71 cfs

==========

DRAINAGE AREA

ID:None Selected
CN = 86
Area = 7.000 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

2.0983 in
1.224 ac-ft

HYG Volume... 1.224 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .25000 hrs (ID: None Selected)
Computational Incr, Tm = .03333 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak,	qp =	31.73 cfs
Unit peak time	Tp =	.16667 hrs
Unit receding limb,	Tr =	.66667 hrs
Total unit time,	Tb =	.83333 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 5 year storm
Duration = 24.0000 hrs Rain Depth = 4.5000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = F:\HYDRO\PROJECTS\FALCON FALLS 3RD\
HYG File - ID = - SCS UH 20 5y24h
Tc = .2500 hrs
Drainage Area = 7.000 acres Runoff CN= 86

==========

Computational Time Increment	=	.03333 hrs
Computed Peak Time	=	12.0333 hrs
Computed Peak Flow	=	25.33 cfs
Time Increment for HYG File	=	.0500 hrs
Peak Time, Interpolated Output	=	12.0500 hrs
Peak Flow, Interpolated Output	=	25.07 cfs

==========

DRAINAGE AREA

ID:None Selected
CN = 86
Area = 7.000 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

3.0032 in
1.752 ac-ft

HYG Volume... 1.752 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .25000 hrs (ID: None Selected)
Computational Incr, Tm = .03333 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak,	qp =	31.73 cfs
Unit peak time	Tp =	.16667 hrs
Unit receding limb,	Tr =	.66667 hrs
Total unit time,	Tb =	.83333 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 7.9000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = F:\HYDRO\PROJECTS\FALCON FALLS 3RD\
HYG File - ID = - SCS UH 20 100y24
Tc = .2500 hrs
Drainage Area = 7.000 acres Runoff CN= 86

==========
Computational Time Increment = .03333 hrs
Computed Peak Time = 12.0333 hrs
Computed Peak Flow = 50.91 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0500 hrs
Peak Flow, Interpolated Output = 50.20 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 86
Area = 7.000 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

6.2345 in
3.637 ac-ft

HYG Volume... 3.637 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .25000 hrs (ID: None Selected)
Computational Incr, Tm = .03333 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 31.73 cfs
Unit peak time Tp = .16667 hrs
Unit receding limb, Tr = .66667 hrs
Total unit time, Tb = .83333 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = 3.5000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = F:\HYDRO\PROJECTS\FALCON FALLS 3RD\
HYG File - ID = - SCS UH 30 2y24h
Tc = 8.0000 hrs
Drainage Area = 8000.000 acres Runoff CN= 96

==========
Computational Time Increment = 1.06667 hrs
Computed Peak Time = 17.0667 hrs
Computed Peak Flow = 2579.39 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 17.0500 hrs
Peak Flow, Interpolated Output = 2577.30 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 96
Area = 8000.000 acres
S = .4167 in
0.2S = .0833 in

Cumulative Runoff

3.0453 in
2030.193 ac-ft

HYG Volume... 2030.216 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = 8.00000 hrs (ID: None Selected)
Computational Incr, Tm = 1.06667 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 1133.04 cfs
Unit peak time Tp = 5.33333 hrs
Unit receding limb, Tr = 21.33333 hrs
Total unit time, Tb = 26.66667 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 5 year storm
Duration = 24.0000 hrs Rain Depth = 4.5000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = F:\HYDRO\PROJECTS\FALCON FALLS 3RD\
HYG File - ID = - SCS UH 30 5y24h
Tc = 8.0000 hrs
Drainage Area = 8000.000 acres Runoff CN= 96

==========
Computational Time Increment = 1.06667 hrs
Computed Peak Time = 17.0667 hrs
Computed Peak Flow = 3394.71 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 17.0500 hrs
Peak Flow, Interpolated Output = 3392.15 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 96
Area = 8000.000 acres
S = .4167 in
0.2S = .0833 in

Cumulative Runoff

4.0359 in
2690.613 ac-ft

HYG Volume... 2690.643 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = 8.00000 hrs (ID: None Selected)
Computational Incr, Tm = 1.06667 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 1133.04 cfs
Unit peak time Tp = 5.33333 hrs
Unit receding limb, Tr = 21.33333 hrs
Total unit time, Tb = 26.66667 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 7.9000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = F:\HYDRO\PROJECTS\FALCON FALLS 3RD\
HYG File - ID = - SCS UH 30 100y24
Tc = 8.0000 hrs
Drainage Area = 8000.000 acres Runoff CN= 96

==========
Computational Time Increment = 1.06667 hrs
Computed Peak Time = 17.0667 hrs
Computed Peak Flow = 6145.34 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 17.0500 hrs
Peak Flow, Interpolated Output = 6141.22 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 96
Area = 8000.000 acres
S = .4167 in
0.2S = .0833 in

Cumulative Runoff

7.4211 in
4947.391 ac-ft

HYG Volume... 4947.442 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = 8.00000 hrs (ID: None Selected)
Computational Incr, Tm = 1.06667 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 1133.04 cfs
Unit peak time Tp = 5.33333 hrs
Unit receding limb, Tr = 21.33333 hrs
Total unit time, Tb = 26.66667 hrs

TIME vs. VOLUME (ac-ft)

Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
.0000	.000	.000	.000	.000	.000
.2500	.000	.000	.000	.000	.000
.5000	.000	.000	.000	.000	.000
.7500	.000	.000	.000	.000	.000
1.0000	.000	.000	.000	.000	.000
1.2500	.000	.000	.000	.000	.000
1.5000	.000	.000	.000	.000	.000
1.7500	.000	.000	.000	.000	.000
2.0000	.000	.000	.000	.000	.000
2.2500	.000	.000	.000	.000	.000
2.5000	.000	.000	.000	.000	.000
2.7500	.000	.000	.000	.000	.000
3.0000	.000	.000	.000	.000	.000
3.2500	.000	.000	.000	.000	.000
3.5000	.000	.000	.000	.000	.000
3.7500	.000	.000	.000	.000	.000
4.0000	.000	.000	.000	.000	.000
4.2500	.000	.000	.000	.000	.000
4.5000	.000	.000	.000	.000	.000
4.7500	.000	.000	.000	.000	.000
5.0000	.000	.000	.000	.000	.000
5.2500	.000	.000	.000	.000	.000
5.5000	.000	.000	.000	.000	.000
5.7500	.000	.000	.000	.000	.000
6.0000	.000	.000	.000	.000	.000
6.2500	.000	.000	.000	.000	.000
6.5000	.000	.000	.000	.000	.000
6.7500	.000	.000	.000	.000	.000
7.0000	.000	.000	.000	.000	.001
7.2500	.001	.001	.001	.002	.002
7.5000	.002	.003	.003	.004	.004
7.7500	.005	.005	.006	.006	.007
8.0000	.008	.009	.009	.010	.011
8.2500	.012	.013	.014	.015	.016
8.5000	.017	.018	.019	.021	.022
8.7500	.023	.025	.027	.028	.030
9.0000	.032	.034	.036	.038	.040
9.2500	.042	.045	.047	.049	.051
9.5000	.054	.057	.059	.062	.064
9.7500	.067	.070	.073	.076	.079
10.0000	.083	.086	.090	.093	.097
10.2500	.102	.106	.110	.115	.120
10.5000	.125	.130	.136	.142	.148
10.7500	.154	.161	.168	.175	.183
11.0000	.192	.200	.209	.219	.229

TIME vs. VOLUME (ac-ft)

Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
11.2500	.240	.252	.265	.278	.293
11.5000	.309	.326	.346	.372	.408
11.7500	.459	.532	.634	.776	.967
12.0000	1.202	1.457	1.702	1.907	2.059
12.2500	2.166	2.240	2.292	2.331	2.359
12.5000	2.379	2.393	2.403	2.408	2.410
12.7500	2.410	2.408	2.405	2.401	2.396
13.0000	2.390	2.384	2.377	2.369	2.361
13.2500	2.352	2.343	2.334	2.324	2.315
13.5000	2.305	2.294	2.284	2.273	2.263
13.7500	2.252	2.241	2.230	2.218	2.207
14.0000	2.196	2.184	2.173	2.161	2.150
14.2500	2.138	2.127	2.116	2.104	2.093
14.5000	2.082	2.071	2.061	2.050	2.039
14.7500	2.029	2.018	2.008	1.998	1.988
15.0000	1.978	1.968	1.959	1.949	1.939
15.2500	1.930	1.920	1.911	1.902	1.893
15.5000	1.883	1.874	1.865	1.856	1.847
15.7500	1.838	1.829	1.820	1.811	1.802
16.0000	1.793	1.784	1.775	1.766	1.757
16.2500	1.748	1.740	1.731	1.722	1.714
16.5000	1.706	1.697	1.689	1.681	1.673
16.7500	1.665	1.657	1.649	1.641	1.633
17.0000	1.626	1.618	1.610	1.603	1.595
17.2500	1.588	1.581	1.574	1.566	1.559
17.5000	1.552	1.545	1.538	1.532	1.525
17.7500	1.518	1.512	1.505	1.498	1.492
18.0000	1.485	1.479	1.473	1.466	1.460
18.2500	1.454	1.448	1.441	1.435	1.429
18.5000	1.423	1.417	1.412	1.406	1.400
18.7500	1.394	1.388	1.383	1.377	1.372
19.0000	1.366	1.361	1.355	1.350	1.344
19.2500	1.339	1.334	1.328	1.323	1.318
19.5000	1.313	1.308	1.303	1.298	1.292
19.7500	1.287	1.282	1.278	1.273	1.268
20.0000	1.263	1.258	1.253	1.248	1.244
20.2500	1.239	1.234	1.230	1.225	1.221
20.5000	1.216	1.212	1.208	1.203	1.199
20.7500	1.195	1.191	1.187	1.183	1.179
21.0000	1.175	1.171	1.167	1.164	1.160
21.2500	1.156	1.153	1.149	1.146	1.142
21.5000	1.139	1.135	1.132	1.129	1.125
21.7500	1.122	1.119	1.116	1.112	1.109
22.0000	1.106	1.103	1.100	1.097	1.094
22.2500	1.091	1.089	1.086	1.083	1.080
22.5000	1.078	1.075	1.072	1.070	1.067

TIME vs. VOLUME (ac-ft)

Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
22.7500	1.065	1.062	1.059	1.057	1.054
23.0000	1.052	1.050	1.047	1.045	1.043
23.2500	1.040	1.038	1.036	1.033	1.031
23.5000	1.029	1.027	1.025	1.023	1.021
23.7500	1.019	1.017	1.014	1.012	1.010
24.0000	1.008	1.006	1.004	1.001	.998
24.2500	.993	.989	.984	.979	.974
24.5000	.969	.963	.959	.954	.949
24.7500	.944	.939	.934	.929	.925
25.0000	.920	.915	.911	.906	.902
25.2500	.897	.892	.888	.883	.879
25.5000	.874	.870	.865	.861	.857
25.7500	.852	.848	.843	.839	.835
26.0000	.831	.826	.822	.818	.814
26.2500	.810	.806	.801	.797	.793
26.5000	.789	.785	.781	.777	.773
26.7500	.769	.765	.762	.758	.754
27.0000	.750	.746	.742	.739	.735
27.2500	.731	.727	.724	.720	.716
27.5000	.713	.709	.705	.702	.698
27.7500	.695	.691	.688	.684	.681
28.0000	.677	.674	.670	.667	.663
28.2500	.660	.656	.653	.650	.647
28.5000	.643	.640	.637	.634	.630
28.7500	.627	.624	.621	.617	.614
29.0000	.611	.608	.605	.602	.599
29.2500	.596	.593	.590	.587	.584
29.5000	.581	.578	.575	.572	.569
29.7500	.566	.563	.560	.557	.555
30.0000	.552	.549	.546	.543	.541
30.2500	.538	.535	.532	.529	.527
30.5000	.524	.521	.519	.516	.513
30.7500	.511	.508	.506	.503	.501
31.0000	.498	.496	.493	.491	.488
31.2500	.485	.483	.480	.478	.475
31.5000	.473	.471	.468	.466	.464
31.7500	.461	.459	.457	.454	.452
32.0000	.450	.447	.445	.443	.440
32.2500	.438	.436	.434	.431	.429
32.5000	.427	.425	.423	.421	.419
32.7500	.417	.415	.412	.410	.408
33.0000	.406	.404	.402	.400	.398
33.2500	.396	.394	.392	.389	.387
33.5000	.385	.383	.382	.380	.378
33.7500	.376	.374	.372	.370	.369
34.0000	.367	.365	.363	.361	.359

TIME vs. VOLUME (ac-ft)

Output Time increment = .0500 hrs

Time hrs	Time on left represents time for first value in each row.				
34.2500	.357	.356	.354	.352	.350
34.5000	.348	.346	.344	.343	.341
34.7500	.339	.338	.336	.334	.333
35.0000	.331				

TIME vs. VOLUME (ac-ft)

Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
.0000	.000	.000	.000	.000	.000
.2500	.000	.000	.000	.000	.000
.5000	.000	.000	.000	.000	.000
.7500	.000	.000	.000	.000	.000
1.0000	.000	.000	.000	.000	.000
1.2500	.000	.000	.000	.000	.000
1.5000	.000	.000	.000	.000	.000
1.7500	.000	.000	.000	.000	.000
2.0000	.000	.000	.000	.000	.000
2.2500	.000	.000	.000	.000	.000
2.5000	.000	.000	.000	.000	.000
2.7500	.000	.000	.000	.000	.000
3.0000	.000	.000	.000	.000	.000
3.2500	.000	.000	.000	.000	.000
3.5000	.000	.000	.000	.000	.000
3.7500	.000	.000	.000	.000	.000
4.0000	.000	.000	.000	.000	.000
4.2500	.000	.000	.000	.000	.000
4.5000	.000	.000	.000	.000	.000
4.7500	.000	.000	.000	.000	.000
5.0000	.000	.000	.000	.000	.000
5.2500	.000	.000	.000	.000	.000
5.5000	.000	.000	.000	.000	.000
5.7500	.000	.000	.000	.000	.000
6.0000	.000	.001	.001	.001	.001
6.2500	.002	.002	.003	.003	.004
6.5000	.004	.005	.006	.006	.007
6.7500	.008	.009	.010	.011	.012
7.0000	.013	.014	.015	.016	.017
7.2500	.018	.020	.021	.022	.024
7.5000	.025	.027	.028	.030	.032
7.7500	.033	.035	.037	.038	.040
8.0000	.042	.044	.046	.048	.050
8.2500	.052	.055	.057	.060	.062
8.5000	.065	.067	.070	.073	.076
8.7500	.080	.083	.086	.090	.093
9.0000	.097	.101	.105	.109	.113
9.2500	.118	.122	.127	.131	.136
9.5000	.140	.145	.150	.154	.159
9.7500	.164	.169	.175	.180	.186
10.0000	.192	.198	.205	.211	.218
10.2500	.225	.233	.240	.249	.257
10.5000	.265	.274	.284	.293	.304
10.7500	.314	.325	.337	.350	.362
11.0000	.376	.390	.405	.420	.437

TIME vs. VOLUME (ac-ft)

Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
11.2500	.454	.473	.493	.515	.538
11.5000	.562	.589	.620	.660	.716
11.7500	.794	.903	1.053	1.257	1.528
12.0000	1.858	2.213	2.547	2.823	3.023
12.2500	3.159	3.249	3.309	3.348	3.373
12.5000	3.388	3.395	3.395	3.390	3.381
12.7500	3.369	3.355	3.339	3.323	3.305
13.0000	3.287	3.269	3.249	3.230	3.209
13.2500	3.189	3.168	3.147	3.127	3.106
13.5000	3.085	3.064	3.043	3.022	3.001
13.7500	2.980	2.959	2.939	2.918	2.897
14.0000	2.876	2.856	2.835	2.814	2.794
14.2500	2.773	2.753	2.733	2.713	2.694
14.5000	2.674	2.655	2.637	2.618	2.600
14.7500	2.582	2.564	2.546	2.529	2.511
15.0000	2.494	2.478	2.461	2.444	2.428
15.2500	2.412	2.396	2.380	2.365	2.350
15.5000	2.334	2.319	2.304	2.289	2.275
15.7500	2.260	2.246	2.232	2.220	2.208
16.0000	2.197	2.186	2.176	2.166	2.156
16.2500	2.147	2.138	2.129	2.121	2.113
16.5000	2.105	2.098	2.091	2.084	2.078
16.7500	2.072	2.066	2.061	2.056	2.051
17.0000	2.046	2.042	2.038	2.034	2.030
17.2500	2.025	2.021	2.016	2.011	2.006
17.5000	2.001	1.995	1.990	1.984	1.978
17.7500	1.972	1.966	1.959	1.953	1.946
18.0000	1.939	1.932	1.925	1.917	1.910
18.2500	1.901	1.893	1.883	1.874	1.863
18.5000	1.853	1.844	1.834	1.824	1.815
18.7500	1.805	1.796	1.787	1.778	1.768
19.0000	1.759	1.750	1.741	1.732	1.722
19.2500	1.713	1.705	1.696	1.687	1.678
19.5000	1.670	1.661	1.652	1.644	1.636
19.7500	1.627	1.619	1.611	1.603	1.595
20.0000	1.587	1.579	1.571	1.563	1.556
20.2500	1.548	1.540	1.533	1.525	1.518
20.5000	1.511	1.504	1.497	1.490	1.483
20.7500	1.476	1.470	1.463	1.457	1.450
21.0000	1.444	1.438	1.431	1.425	1.419
21.2500	1.413	1.407	1.402	1.396	1.390
21.5000	1.385	1.379	1.374	1.368	1.363
21.7500	1.358	1.352	1.347	1.342	1.337
22.0000	1.332	1.327	1.323	1.318	1.313
22.2500	1.308	1.304	1.299	1.295	1.290
22.5000	1.286	1.282	1.277	1.273	1.269

TIME vs. VOLUME (ac-ft)

Time hrs	Output Time increment = .0500 hrs Time on left represents time for first value in each row.				
22.7500	1.265	1.261	1.257	1.253	1.249
23.0000	1.245	1.241	1.237	1.234	1.230
23.2500	1.226	1.222	1.219	1.215	1.212
23.5000	1.208	1.205	1.201	1.198	1.195
23.7500	1.192	1.188	1.185	1.182	1.179
24.0000	1.176	1.172	1.169	1.164	1.159
24.2500	1.153	1.146	1.139	1.132	1.125
24.5000	1.118	1.110	1.103	1.097	1.090
24.7500	1.083	1.076	1.070	1.063	1.057
25.0000	1.050	1.044	1.038	1.032	1.026
25.2500	1.020	1.014	1.009	1.003	.998
25.5000	.992	.987	.981	.976	.971
25.7500	.966	.961	.956	.951	.946
26.0000	.941	.936	.931	.927	.922
26.2500	.918	.913	.908	.904	.899
26.5000	.894	.890	.885	.881	.876
26.7500	.872	.867	.863	.859	.854
27.0000	.850	.845	.841	.837	.832
27.2500	.828	.824	.820	.816	.812
27.5000	.807	.803	.799	.795	.791
27.7500	.787	.783	.779	.775	.771
28.0000	.767	.763	.759	.756	.752
28.2500	.748	.744	.740	.737	.733
28.5000	.729	.725	.722	.718	.714
28.7500	.711	.707	.703	.700	.696
29.0000	.693	.689	.686	.682	.679
29.2500	.675	.672	.668	.665	.661
29.5000	.658	.655	.651	.648	.645
29.7500	.642	.638	.635	.632	.629
30.0000	.625	.622	.619	.616	.612
30.2500	.609	.606	.603	.600	.597
30.5000	.594	.591	.588	.585	.582
30.7500	.579	.576	.573	.570	.567
31.0000	.564	.562	.559	.556	.553
31.2500	.551	.548	.545	.542	.539
31.5000	.537	.534	.531	.528	.526
31.7500	.523	.520	.517	.515	.512
32.0000	.510	.507	.505	.502	.500
32.2500	.497	.494	.492	.489	.487
32.5000	.484	.482	.479	.477	.474
32.7500	.472	.470	.467	.465	.463
33.0000	.460	.458	.456	.453	.451
33.2500	.449	.446	.444	.442	.440
33.5000	.437	.435	.433	.430	.428
33.7500	.426	.424	.422	.420	.418
34.0000	.416	.414	.411	.409	.407

TIME vs. VOLUME (ac-ft)

Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
34.2500	.405	.403	.401	.399	.397
34.5000	.395	.393	.391	.389	.386
34.7500	.384	.383	.381	.379	.377
35.0000	.375				

TIME vs. VOLUME (ac-ft)

Time hrs	Output Time increment = .0500 hrs Time on left represents time for first value in each row.				
.0000	.000	.000	.000	.000	.000
.2500	.000	.000	.000	.000	.000
.5000	.000	.000	.000	.000	.000
.7500	.000	.000	.000	.000	.000
1.0000	.000	.000	.000	.000	.000
1.2500	.000	.000	.000	.000	.000
1.5000	.000	.000	.000	.000	.000
1.7500	.000	.000	.000	.000	.000
2.0000	.000	.000	.000	.000	.000
2.2500	.000	.000	.000	.000	.000
2.5000	.000	.000	.000	.000	.000
2.7500	.000	.000	.000	.000	.000
3.0000	.000	.000	.000	.000	.000
3.2500	.000	.000	.000	.000	.000
3.5000	.000	.000	.000	.000	.000
3.7500	.000	.000	.000	.001	.001
4.0000	.001	.002	.002	.003	.004
4.2500	.004	.005	.006	.007	.008
4.5000	.010	.011	.012	.013	.015
4.7500	.016	.018	.020	.022	.023
5.0000	.025	.027	.029	.032	.034
5.2500	.036	.039	.041	.044	.047
5.5000	.050	.052	.055	.058	.061
5.7500	.065	.068	.071	.075	.078
6.0000	.082	.086	.089	.093	.097
6.2500	.102	.106	.110	.114	.119
6.5000	.123	.128	.132	.137	.142
6.7500	.147	.152	.157	.162	.167
7.0000	.173	.178	.184	.189	.195
7.2500	.201	.206	.212	.218	.224
7.5000	.231	.237	.243	.250	.256
7.7500	.263	.269	.276	.283	.290
8.0000	.297	.304	.311	.318	.326
8.2500	.333	.341	.349	.358	.366
8.5000	.375	.384	.393	.403	.413
8.7500	.423	.433	.444	.455	.466
9.0000	.478	.489	.501	.514	.526
9.2500	.539	.552	.565	.578	.591
9.5000	.604	.617	.630	.644	.657
9.7500	.671	.685	.700	.715	.730
10.0000	.746	.762	.779	.797	.815
10.2500	.833	.852	.872	.893	.914
10.5000	.936	.959	.982	1.006	1.031
10.7500	1.056	1.083	1.110	1.138	1.167
11.0000	1.198	1.229	1.262	1.295	1.331

TIME vs. VOLUME (ac-ft)

Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
11.2500	1.369	1.409	1.451	1.496	1.544
11.5000	1.595	1.650	1.713	1.796	1.910
11.7500	2.071	2.294	2.598	3.008	3.538
12.0000	4.171	4.839	5.454	5.944	6.284
12.2500	6.497	6.619	6.683	6.710	6.709
12.5000	6.688	6.653	6.607	6.551	6.490
12.7500	6.424	6.355	6.285	6.214	6.142
13.0000	6.071	5.999	5.928	5.857	5.786
13.2500	5.716	5.647	5.578	5.511	5.444
13.5000	5.378	5.314	5.249	5.186	5.124
13.7500	5.063	5.002	4.943	4.884	4.826
14.0000	4.769	4.713	4.658	4.603	4.550
14.2500	4.497	4.446	4.397	4.348	4.301
14.5000	4.256	4.211	4.169	4.133	4.107
14.7500	4.089	4.079	4.075	4.079	4.089
15.0000	4.104	4.123	4.148	4.177	4.211
15.2500	4.249	4.291	4.336	4.385	4.436
15.5000	4.491	4.547	4.604	4.662	4.722
15.7500	4.784	4.848	4.915	4.985	5.057
16.0000	5.130	5.203	5.269	5.331	5.391
16.2500	5.447	5.500	5.551	5.600	5.646
16.5000	5.691	5.734	5.775	5.814	5.852
16.7500	5.889	5.924	5.958	5.991	6.023
17.0000	6.054	6.084	6.114	6.139	6.160
17.2500	6.177	6.190	6.201	6.208	6.213
17.5000	6.215	6.215	6.213	6.209	6.202
17.7500	6.194	6.185	6.173	6.160	6.146
18.0000	6.130	6.114	6.096	6.078	6.057
18.2500	6.032	6.005	5.975	5.943	5.909
18.5000	5.872	5.834	5.794	5.753	5.710
18.7500	5.667	5.625	5.583	5.541	5.498
19.0000	5.454	5.408	5.361	5.312	5.262
19.2500	5.209	5.152	5.092	5.028	4.963
19.5000	4.899	4.839	4.781	4.725	4.669
19.7500	4.613	4.557	4.501	4.444	4.386
20.0000	4.326	4.264	4.202	4.142	4.084
20.2500	4.028	3.972	3.919	3.868	3.819
20.5000	3.771	3.724	3.677	3.632	3.586
20.7500	3.540	3.496	3.452	3.410	3.369
21.0000	3.329	3.290	3.252	3.215	3.179
21.2500	3.144	3.110	3.076	3.044	3.012
21.5000	2.981	2.951	2.922	2.893	2.864
21.7500	2.837	2.809	2.783	2.757	2.731
22.0000	2.706	2.681	2.657	2.633	2.609
22.2500	2.587	2.564	2.542	2.521	2.500
22.5000	2.479	2.459	2.439	2.419	2.400

TIME vs. VOLUME (ac-ft)

Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
22.7500	2.381	2.363	2.345	2.327	2.309
23.0000	2.292	2.275	2.259	2.243	2.227
23.2500	2.212	2.196	2.181	2.167	2.153
23.5000	2.139	2.125	2.111	2.098	2.085
23.7500	2.072	2.060	2.048	2.035	2.024
24.0000	2.012	2.000	1.988	1.975	1.960
24.2500	1.943	1.926	1.909	1.891	1.873
24.5000	1.855	1.838	1.820	1.803	1.786
24.7500	1.770	1.753	1.737	1.721	1.705
25.0000	1.690	1.674	1.659	1.644	1.630
25.2500	1.615	1.601	1.587	1.573	1.559
25.5000	1.546	1.533	1.520	1.507	1.494
25.7500	1.481	1.469	1.457	1.445	1.433
26.0000	1.421	1.410	1.398	1.387	1.376
26.2500	1.365	1.355	1.344	1.333	1.323
26.5000	1.313	1.303	1.293	1.284	1.274
26.7500	1.265	1.255	1.246	1.237	1.228
27.0000	1.220	1.211	1.202	1.194	1.186
27.2500	1.178	1.170	1.162	1.154	1.146
27.5000	1.139	1.131	1.124	1.116	1.109
27.7500	1.102	1.095	1.088	1.082	1.075
28.0000	1.068	1.062	1.056	1.049	1.043
28.2500	1.037	1.031	1.025	1.019	1.013
28.5000	1.008	1.002	.996	.991	.985
28.7500	.980	.975	.970	.965	.960
29.0000	.955	.950	.945	.940	.935
29.2500	.930	.926	.921	.916	.912
29.5000	.907	.903	.898	.893	.889
29.7500	.884	.880	.875	.871	.866
30.0000	.862	.858	.853	.849	.844
30.2500	.840	.836	.832	.827	.823
30.5000	.819	.815	.811	.807	.802
30.7500	.798	.794	.790	.786	.782
31.0000	.778	.774	.770	.766	.762
31.2500	.759	.755	.751	.747	.743
31.5000	.739	.736	.732	.728	.724
31.7500	.721	.717	.713	.710	.706
32.0000	.702	.699	.695	.692	.688
32.2500	.685	.681	.678	.674	.671
32.5000	.667	.664	.660	.657	.654
32.7500	.651	.647	.644	.641	.638
33.0000	.634	.631	.628	.625	.621
33.2500	.618	.615	.612	.609	.606
33.5000	.603	.600	.596	.593	.590
33.7500	.587	.584	.581	.578	.575
34.0000	.572	.569	.566	.564	.561

TIME vs. VOLUME (ac-ft)

Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
34.2500	.558	.555	.552	.550	.547
34.5000	.544	.541	.539	.536	.533
34.7500	.530	.527	.525	.522	.519
35.0000	.517				

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\FALCON FALLS 3RD.PPW

Elevation (ft)	Planimeter (sq.in)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	Volume (ac-ft)	Volume Sum (ac-ft)
1342.00	-----	1.8000	.0000	.000	.000
1343.00	-----	2.0000	5.6974	1.899	1.899
1344.00	-----	2.1000	6.1494	2.050	3.949
1345.00	-----	2.3000	6.5977	2.199	6.148
1346.00	-----	2.4000	7.0495	2.350	8.498
1347.00	-----	2.6000	7.4980	2.499	10.997

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Type.... Elev-Flow
Name.... OUT 10

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\FALCON FALLS 3RD.PPW

ELEVATION-FLOW TABLE

Elev, ft	Flow, cfs
1334.00	.00
1342.40	2990.00
1344.41	5280.00
1345.09	6190.00

Index of Starting Page Numbers for ID Names

----- P -----
POND... 5.01, 4.01, 4.05, 4.09

----- S -----
SCS UH 10 2y24h... 3.03, 3.04, 3.05
SCS UH 20 2y24h... 3.06, 3.07, 3.08
SCS UH 30 2y24h... 3.09, 3.10, 3.11
Sedgwick24... 2.01, 2.02

----- W -----
Watershed... 1.01

PondPack

w/Maximum Tailwater Effect

CN = 86.0
AREA = 19.2 acres
T_c = 15 min

CN = 86.0
AREA = 7.0 acres
T_c = 15 min

A 10

A 20

Starting WS Elev = 1345.0

Pond

PR 10

TAILWATER = 1345.0 throughout entire period

Out 10

Job File: F:\HYDRO\PROJECTS\FALCON FALLS 3RD\FALCON FALLS 3RD W_TAIL.PPW
Rain Dir: C:\HAESTAD\PPKW\RAINFALL\

==========
JOB TITLE
==========

JOB TITLE NOT SPECIFIED
Click Project Summary on the File Menu to enter title

Table of Contents

********** MASTER SUMMARY **********

Watershed..... Master Network Summary 1.01

********** DESIGN STORMS SUMMARY **********

Sedgwick24..... Design Storms 2.01

Sedgwick24..... 5y24h
Design Storms 2.02

********** RAINFALL DATA **********

TypeII 24hr.... 2y24h
Synthetic Cumulative Depth 3.01

TypeII 24hr.... 5y24h
Synthetic Cumulative Depth 3.03

TypeII 24hr.... 100y24
Synthetic Cumulative Depth 3.05

********** RUNOFF HYDROGRAPHS **********

SCS UH 10..... 2y24h
SCS Unit Hyd. Summary 4.01

SCS UH 10..... 5y24h
SCS Unit Hyd. Summary 4.02

SCS UH 10..... 100y24
SCS Unit Hyd. Summary 4.03

SCS UH 20..... 2y24h
SCS Unit Hyd. Summary 4.04

Table of Contents (continued)

SCS UH 20..... 5y24h
SCS Unit Hyd. Summary 4.05

SCS UH 20..... 100y24
SCS Unit Hyd. Summary 4.06

********** POND VOLUMES **********

POND..... Vol: Elev-Area 5.01

********** OUTLET STRUCTURES **********

E-Q-TW 10..... E-Q-TW Series 6.01
E-Q-TW Series 6.08
E-Q-TW Series 6.15

MASTER DESIGN STORM SUMMARY

Default Network Design Storm File, ID SEDGWICK.RNQ Sedgwick24

Return Event	Total Depth in	Rainfall Type	RNF File	RNF ID
5y24h	4.5000	Synthetic Curve	SCSTYPES	TypeII 24hr
100y24	7.9000	Synthetic Curve	SCSTYPES	TypeII 24hr
2y24h	3.5000	Synthetic Curve	SCSTYPES	TypeII 24hr

ICPM CALCULATION TOLERANCES

Target Convergence=	.000	cfs +/-
Max. Iterations =	35	loops
ICPM Time Step =	.0500	hrs
Output Time Step =	.0500	hrs
ICPM Ending Time =	35.0000	hrs

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Storage Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond ac-ft
*OUT 10	T-E	5	6.581		12.3000	30.49	1345.00	
*OUT 10	T-E	100	13.640		12.3500	46.22	1345.00	
*OUT 10	T-E	2	4.608		12.2500	24.69	1345.00	
POND	POND	5	6.557		12.0500	93.82		
POND	POND	100	13.612		12.0500	187.88		
POND	POND	2	4.581		12.0500	66.27		
POND OUT	POND	5	6.581		12.3000	30.49	1345.87	8.188
POND OUT	POND	100	13.640		12.3500	46.22	1346.96	10.896
POND OUT	POND	2	4.608		12.2500	24.69	1345.57	7.485
SCS UH 10	AREA	5	4.805		12.0500	68.75		
SCS UH 10	AREA	100	9.975		12.0500	137.69		
SCS UH 10	AREA	2	3.357		12.0500	48.57		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Storage Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond ac-ft
SCS UH 20	AREA	5	1.752		12.0500	25.07		
SCS UH 20	AREA	100	3.637		12.0500	50.20		
SCS UH 20	AREA	2	1.224		12.0500	17.71		

File.... C:\HAESTAD\PPKW\RAINFALL\SEDGWICK.RNQ
Title...

JOB TITLE NOT SPECIFIED
Click Project Summary on the File Menu to enter title

DESIGN STORMS SUMMARY

Design Storm File,ID = SEDGWICK.RNQ Sedgwick24

Storm Tag Name = 5y24h
Description: Sedgwick County 5-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 5 yr
Total Rainfall Depth= 4.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 100y24
Description: Sedgwick County 100-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 100 yr
Total Rainfall Depth= 7.9000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 2y24h
Description: Sedgwick County 2-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 2 yr
Total Rainfall Depth= 3.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

DESIGN STORMS SUMMARY

Design Storm File,ID = SEDGWICK.RNQ Sedgwick24

Storm Tag Name   = 5y24h
Description: Sedgwick County 5-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency   = 5 yr
Total Rainfall Depth= 4.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name   = 100y24
Description: Sedgwick County 100-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency   = 100 yr
Total Rainfall Depth= 7.9000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name   = 2y24h
Description: Sedgwick County 2-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency   = 2 yr
Total Rainfall Depth= 3.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

CUMULATIVE RAINFALL DEPTHS (in)
Output Time increment = .1000 hrs
Time on left represents time for first value in each row.

Time hrs					
.0000	.0000	.0035	.0071	.0107	.0143
.5000	.0180	.0216	.0254	.0291	.0329
1.0000	.0368	.0406	.0445	.0485	.0524
1.5000	.0565	.0605	.0646	.0687	.0728
2.0000	.0770	.0812	.0855	.0898	.0941
2.5000	.0985	.1028	.1073	.1117	.1162
3.0000	.1208	.1253	.1299	.1346	.1392
3.5000	.1440	.1487	.1535	.1583	.1631
4.0000	.1680	.1729	.1779	.1830	.1882
4.5000	.1934	.1987	.2040	.2094	.2149
5.0000	.2205	.2261	.2318	.2376	.2435
5.5000	.2494	.2554	.2614	.2675	.2737
6.0000	.2800	.2863	.2927	.2992	.3058
6.5000	.3124	.3191	.3258	.3326	.3395
7.0000	.3465	.3535	.3606	.3678	.3751
7.5000	.3824	.3898	.3972	.4047	.4123
8.0000	.4200	.4279	.4361	.4447	.4536
8.5000	.4629	.4725	.4825	.4928	.5035
9.0000	.5145	.5257	.5369	.5481	.5593
9.5000	.5705	.5820	.5940	.6066	.6198
10.0000	.6335	.6479	.6632	.6793	.6962
10.5000	.7140	.7329	.7532	.7749	.7980
11.0000	.8225	.8494	.8796	.9132	.9502
11.5000	.9905	1.0739	1.2403	1.5078	1.9875
12.0000	2.3205	2.3869	2.4452	2.4956	2.5381
12.5000	2.5725	2.6020	2.6298	2.6557	2.6797
13.0000	2.7020	2.7229	2.7427	2.7616	2.7796
13.5000	2.7965	2.8126	2.8280	2.8427	2.8567
14.0000	2.8700	2.8828	2.8954	2.9078	2.9198
14.5000	2.9317	2.9433	2.9547	2.9658	2.9766
15.0000	2.9873	2.9976	3.0078	3.0177	3.0273
15.5000	3.0367	3.0458	3.0548	3.0634	3.0718
16.0000	3.0800	3.0880	3.0959	3.1038	3.1115
16.5000	3.1192	3.1267	3.1342	3.1416	3.1489
17.0000	3.1561	3.1633	3.1703	3.1773	3.1841
17.5000	3.1909	3.1976	3.2042	3.2107	3.2172
18.0000	3.2235	3.2298	3.2359	3.2420	3.2480
18.5000	3.2539	3.2597	3.2655	3.2711	3.2767
19.0000	3.2821	3.2875	3.2928	3.2980	3.3031
19.5000	3.3082	3.3131	3.3180	3.3227	3.3274
20.0000	3.3320	3.3366	3.3411	3.3456	3.3501
20.5000	3.3545	3.3590	3.3634	3.3678	3.3723
21.0000	3.3766	3.3810	3.3853	3.3897	3.3940
21.5000	3.3983	3.4026	3.4068	3.4111	3.4153
22.0000	3.4195	3.4237	3.4279	3.4320	3.4362

Type.... Synthetic Cumulative Depth
Name.... TypeII 24hr Tag: 2y24h
File.... C:\HAESTAD\PPKW\RAINFALL\SCSTYPES.RNF
Title... Sedgwick County 2-yr 24 hour Duration
Storm... TypeII 24hr Tag: 2y24h

CUMULATIVE RAINFALL DEPTHS (in)
Output Time increment = .1000 hrs
Time on left represents time for first value in each row.

Time hrs					
22.5000	3.4403	3.4444	3.4485	3.4525	3.4566
23.0000	3.4606	3.4647	3.4686	3.4726	3.4766
23.5000	3.4805	3.4845	3.4884	3.4923	3.4962
24.0000	3.5000				

CUMULATIVE RAINFALL DEPTHS (in)
Output Time increment = .1000 hrs
Time on left represents time for first value in each row.

Time hrs					
.0000	.0000	.0045	.0091	.0137	.0184
.5000	.0231	.0278	.0326	.0374	.0423
1.0000	.0473	.0522	.0572	.0623	.0674
1.5000	.0726	.0778	.0830	.0883	.0936
2.0000	.0990	.1044	.1099	.1154	.1210
2.5000	.1266	.1322	.1379	.1436	.1494
3.0000	.1553	.1611	.1670	.1730	.1790
3.5000	.1851	.1912	.1973	.2035	.2097
4.0000	.2160	.2223	.2288	.2353	.2419
4.5000	.2486	.2554	.2623	.2693	.2763
5.0000	.2835	.2907	.2981	.3055	.3130
5.5000	.3206	.3283	.3361	.3440	.3519
6.0000	.3600	.3681	.3764	.3847	.3931
6.5000	.4016	.4102	.4189	.4277	.4365
7.0000	.4455	.4545	.4637	.4729	.4822
7.5000	.4916	.5011	.5107	.5204	.5301
8.0000	.5400	.5501	.5607	.5717	.5832
8.5000	.5951	.6075	.6203	.6336	.6473
9.0000	.6615	.6759	.6903	.7047	.7191
9.5000	.7335	.7483	.7637	.7799	.7969
10.0000	.8145	.8330	.8527	.8734	.8951
10.5000	.9180	.9423	.9684	.9963	1.0260
11.0000	1.0575	1.0921	1.1309	1.1741	1.2217
11.5000	1.2735	1.3808	1.5946	1.9386	2.5554
12.0000	2.9835	3.0688	3.1439	3.2087	3.2632
12.5000	3.3075	3.3455	3.3811	3.4144	3.4454
13.0000	3.4740	3.5008	3.5264	3.5507	3.5737
13.5000	3.5955	3.6162	3.6360	3.6549	3.6729
14.0000	3.6900	3.7065	3.7227	3.7386	3.7541
14.5000	3.7693	3.7842	3.7989	3.8131	3.8271
15.0000	3.8408	3.8541	3.8671	3.8799	3.8922
15.5000	3.9043	3.9161	3.9276	3.9387	3.9495
16.0000	3.9600	3.9703	3.9805	3.9906	4.0005
16.5000	4.0104	4.0201	4.0297	4.0392	4.0486
17.0000	4.0579	4.0671	4.0761	4.0851	4.0939
17.5000	4.1026	4.1112	4.1197	4.1281	4.1364
18.0000	4.1445	4.1526	4.1605	4.1683	4.1760
18.5000	4.1836	4.1911	4.1985	4.2057	4.2129
19.0000	4.2199	4.2268	4.2336	4.2403	4.2469
19.5000	4.2534	4.2597	4.2660	4.2721	4.2781
20.0000	4.2840	4.2899	4.2957	4.3015	4.3072
20.5000	4.3130	4.3187	4.3244	4.3301	4.3358
21.0000	4.3414	4.3470	4.3526	4.3582	4.3637
21.5000	4.3692	4.3747	4.3802	4.3857	4.3911
22.0000	4.3965	4.4019	4.4073	4.4126	4.4179

CUMULATIVE RAINFALL DEPTHS (in)
Output Time increment = .1000 hrs
Time on left represents time for first value in each row.

Time hrs					
22.5000	4.4232	4.4285	4.4338	4.4390	4.4442
23.0000	4.4494	4.4546	4.4597	4.4648	4.4699
23.5000	4.4750	4.4800	4.4851	4.4901	4.4951
24.0000	4.5000				

CUMULATIVE RAINFALL DEPTHS (in)
Output Time increment = .1000 hrs
Time on left represents time for first value in each row.

Time hrs					
.0000	.0000	.0080	.0160	.0241	.0322
.5000	.0405	.0488	.0573	.0657	.0743
1.0000	.0830	.0917	.1005	.1094	.1183
1.5000	.1274	.1365	.1458	.1550	.1644
2.0000	.1738	.1834	.1929	.2026	.2124
2.5000	.2222	.2321	.2421	.2522	.2624
3.0000	.2726	.2829	.2932	.3038	.3143
3.5000	.3249	.3356	.3464	.3572	.3682
4.0000	.3792	.3903	.4016	.4131	.4247
4.5000	.4365	.4484	.4605	.4727	.4851
5.0000	.4977	.5104	.5233	.5363	.5495
5.5000	.5629	.5764	.5901	.6039	.6179
6.0000	.6320	.6463	.6608	.6754	.6901
6.5000	.7051	.7202	.7354	.7508	.7664
7.0000	.7821	.7980	.8140	.8302	.8466
7.5000	.8631	.8797	.8966	.9136	.9307
8.0000	.9480	.9658	.9843	1.0037	1.0238
8.5000	1.0448	1.0665	1.0890	1.1123	1.1364
9.0000	1.1613	1.1866	1.2119	1.2371	1.2624
9.5000	1.2877	1.3136	1.3408	1.3692	1.3989
10.0000	1.4299	1.4624	1.4969	1.5332	1.5715
10.5000	1.6116	1.6543	1.7001	1.7491	1.8012
11.0000	1.8565	1.9172	1.9854	2.0613	2.1447
11.5000	2.2357	2.4240	2.7994	3.4032	4.4861
12.0000	5.2377	5.3875	5.5193	5.6330	5.7288
12.5000	5.8065	5.8732	5.9357	5.9942	6.0486
13.0000	6.0988	6.1459	6.1908	6.2334	6.2739
13.5000	6.3121	6.3484	6.3832	6.4164	6.4480
14.0000	6.4780	6.5070	6.5354	6.5632	6.5905
14.5000	6.6173	6.6434	6.6691	6.6941	6.7187
15.0000	6.7427	6.7661	6.7889	6.8113	6.8330
15.5000	6.8543	6.8749	6.8950	6.9146	6.9336
16.0000	6.9520	6.9701	6.9879	7.0056	7.0231
16.5000	7.0404	7.0575	7.0744	7.0910	7.1076
17.0000	7.1238	7.1399	7.1558	7.1715	7.1870
17.5000	7.2024	7.2174	7.2324	7.2471	7.2616
18.0000	7.2759	7.2900	7.3039	7.3177	7.3312
18.5000	7.3446	7.3577	7.3706	7.3833	7.3959
19.0000	7.4082	7.4204	7.4323	7.4441	7.4556
19.5000	7.4670	7.4781	7.4891	7.4999	7.5105
20.0000	7.5208	7.5311	7.5413	7.5515	7.5616
20.5000	7.5717	7.5817	7.5917	7.6017	7.6117
21.0000	7.6215	7.6314	7.6412	7.6510	7.6607
21.5000	7.6704	7.6801	7.6897	7.6993	7.7088
22.0000	7.7183	7.7278	7.7372	7.7466	7.7559

CUMULATIVE RAINFALL DEPTHS (in)
Output Time increment = .1000 hrs
Time on left represents time for first value in each row.

Time hrs					
22.5000	7.7652	7.7745	7.7837	7.7929	7.8020
23.0000	7.8111	7.8202	7.8292	7.8382	7.8471
23.5000	7.8561	7.8649	7.8738	7.8825	7.8913
24.0000	7.9000				

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = 3.5000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = F:\HYDRO\PROJECTS\FALCON FALLS 3RD\
HYG File - ID = - SCS UH 10 2y24h
Tc = .2500 hrs
Drainage Area = 19.200 acres Runoff CN= 86

==========

Computational Time Increment	=	.03333 hrs
Computed Peak Time	=	12.0333 hrs
Computed Peak Flow	=	48.96 cfs
Time Increment for HYG File	=	.0500 hrs
Peak Time, Interpolated Output	=	12.0500 hrs
Peak Flow, Interpolated Output	=	48.57 cfs

==========

DRAINAGE AREA

ID:None Selected
CN = 86
Area = 19.200 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

2.0983 in
3.357 ac-ft

HYG Volume... 3.357 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .25000 hrs (ID: None Selected)
Computational Incr, Tm = .03333 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak,	qp =	87.02 cfs
Unit peak time	Tp =	.16667 hrs
Unit receding limb,	Tr =	.66667 hrs
Total unit time,	Tb =	.83333 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 5 year storm
Duration = 24.0000 hrs Rain Depth = 4.5000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = F:\HYDRO\PROJECTS\FALCON FALLS 3RD\
HYG File - ID = - SCS UH 10 5y24h
Tc = .2500 hrs
Drainage Area = 19.200 acres Runoff CN= 86

==========

Computational Time Increment	=	.03333 hrs
Computed Peak Time	=	12.0333 hrs
Computed Peak Flow	=	69.48 cfs
Time Increment for HYG File	=	.0500 hrs
Peak Time, Interpolated Output	=	12.0500 hrs
Peak Flow, Interpolated Output	=	68.75 cfs

==========

DRAINAGE AREA

ID:None Selected
CN = 86
Area = 19.200 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

3.0032 in
4.805 ac-ft

HYG Volume... 4.805 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .25000 hrs (ID: None Selected)
Computational Incr, Tm = .03333 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak,	qp =	87.02 cfs
Unit peak time	Tp =	.16667 hrs
Unit receding limb,	Tr =	.66667 hrs
Total unit time,	Tb =	.83333 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 7.9000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = F:\HYDRO\PROJECTS\FALCON FALLS 3RD\
HYG File - ID = - SCS UH 10 100y24
Tc = .2500 hrs
Drainage Area = 19.200 acres Runoff CN= 86

==========
Computational Time Increment = .03333 hrs
Computed Peak Time = 12.0333 hrs
Computed Peak Flow = 139.65 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0500 hrs
Peak Flow, Interpolated Output = 137.69 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 86
Area = 19.200 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

6.2345 in
9.975 ac-ft

HYG Volume... 9.975 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .25000 hrs (ID: None Selected)
Computational Incr, Tm = .03333 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 87.02 cfs
Unit peak time Tp = .16667 hrs
Unit receding limb, Tr = .66667 hrs
Total unit time, Tb = .83333 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = 3.5000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = F:\HYDRO\PROJECTS\FALCON FALLS 3RD\
HYG File - ID = - SCS UH 20 2y24h
Tc = .2500 hrs
Drainage Area = 7.000 acres Runoff CN= 86

==========
Computational Time Increment = .03333 hrs
Computed Peak Time = 12.0333 hrs
Computed Peak Flow = 17.85 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0500 hrs
Peak Flow, Interpolated Output = 17.71 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 86
Area = 7.000 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

2.0983 in
1.224 ac-ft

HYG Volume... 1.224 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .25000 hrs (ID: None Selected)
Computational Incr, Tm = .03333 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 31.73 cfs
Unit peak time Tp = .16667 hrs
Unit receding limb, Tr = .66667 hrs
Total unit time, Tb = .83333 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 5 year storm
Duration = 24.0000 hrs Rain Depth = 4.5000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = F:\HYDRO\PROJECTS\FALCON FALLS 3RD\
HYG File - ID = - SCS UH 20 5y24h
Tc = .2500 hrs
Drainage Area = 7.000 acres Runoff CN= 86

==========

Computational Time Increment	=	.03333 hrs
Computed Peak Time	=	12.0333 hrs
Computed Peak Flow	=	25.33 cfs
Time Increment for HYG File	=	.0500 hrs
Peak Time, Interpolated Output	=	12.0500 hrs
Peak Flow, Interpolated Output	=	25.07 cfs

==========

DRAINAGE AREA

ID:None Selected
CN = 86
Area = 7.000 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

3.0032 in
1.752 ac-ft

HYG Volume... 1.752 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .25000 hrs (ID: None Selected)
Computational Incr, Tm = .03333 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak,	qp =	31.73 cfs
Unit peak time	Tp =	.16667 hrs
Unit receding limb,	Tr =	.66667 hrs
Total unit time,	Tb =	.83333 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 7.9000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = F:\HYDRO\PROJECTS\FALCON FALLS 3RD\
HYG File - ID = - SCS UH 20 100y24
Tc = .2500 hrs
Drainage Area = 7.000 acres Runoff CN= 86

==========
Computational Time Increment = .03333 hrs
Computed Peak Time = 12.0333 hrs
Computed Peak Flow = 50.91 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0500 hrs
Peak Flow, Interpolated Output = 50.20 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 86
Area = 7.000 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

6.2345 in
3.637 ac-ft

HYG Volume... 3.637 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .25000 hrs (ID: None Selected)
Computational Incr, Tm = .03333 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 31.73 cfs
Unit peak time Tp = .16667 hrs
Unit receding limb, Tr = .66667 hrs
Total unit time, Tb = .83333 hrs

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\FALCON FALLS 3RD W_TAIL.PPW

Elevation (ft)	Planimeter (sq.in)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	Volume (ac-ft)	Volume Sum (ac-ft)
1342.00	-----	1.8000	.0000	.000	.000
1343.00	-----	2.0000	5.6974	1.899	1.899
1344.00	-----	2.1000	6.1494	2.050	3.949
1345.00	-----	2.3000	6.5977	2.199	6.148
1346.00	-----	2.4000	7.0495	2.350	8.498
1347.00	-----	2.6000	7.4980	2.499	10.997

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Type.... E-Q-TW Series
Name.... E-Q-TW 10

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft	TW,ft	TW,ft	TW,ft	TW,ft
	1334.00	1334.50	1335.00	1335.50	1336.00
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	.00	.00	.00	.00	.00
1342.50	1.18	1.18	1.18	1.18	1.18
1343.00	4.51	4.51	4.51	4.51	4.51
1343.50	9.69	9.69	9.69	9.69	9.69
1344.00	16.40	16.40	16.40	16.40	16.40
1344.50	24.27	24.27	24.27	24.27	24.27
1345.00	32.66	32.66	32.66	32.66	32.66
1345.50	40.72	40.72	40.72	40.72	40.72
1346.00	47.43	47.43	47.43	47.43	47.43
1346.50	51.97	51.97	51.97	51.97	51.97
1347.00	56.26	56.26	56.26	56.26	56.26

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft	TW,ft	TW,ft	TW,ft	TW,ft
	1336.50	1337.00	1337.50	1338.00	1338.50
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	.00	.00	.00	.00	.00
1342.50	1.18	1.18	1.18	1.18	1.18
1343.00	4.51	4.51	4.51	4.51	4.51
1343.50	9.69	9.69	9.69	9.69	9.69
1344.00	16.40	16.40	16.40	16.40	16.40
1344.50	24.27	24.27	24.27	24.27	24.27
1345.00	32.66	32.66	32.66	32.66	32.66
1345.50	40.72	40.72	40.72	40.72	40.72
1346.00	47.43	47.43	47.43	47.43	47.43
1346.50	51.97	51.97	51.97	51.97	51.97
1347.00	56.26	56.26	56.26	56.26	56.26

Type.... E-Q-TW Series
Name.... E-Q-TW 10

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft	TW,ft	TW,ft	TW,ft	TW,ft
	1339.00	1339.50	1340.00	1340.50	1341.00
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	.00	.00	.00	.00	.00
1342.50	1.18	1.18	1.18	1.18	1.18
1343.00	4.51	4.51	4.51	4.51	4.51
1343.50	9.69	9.69	9.69	9.69	9.69
1344.00	16.40	16.40	16.40	16.40	16.40
1344.50	24.27	24.27	24.27	24.27	24.27
1345.00	32.66	32.66	32.66	32.66	32.66
1345.50	40.72	40.72	40.72	40.72	40.72
1346.00	47.43	47.43	47.43	47.43	47.43
1346.50	51.97	51.97	51.97	51.97	51.97
1347.00	56.26	56.26	56.26	56.26	56.26

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft	TW,ft	TW,ft	TW,ft	TW,ft
	1341.40	1341.50	1342.00	1342.50	1343.00
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	.00	.00	.00	-1.10	-4.34
1342.50	1.18	1.18	1.19	.00	-4.34
1343.00	4.51	4.51	4.51	4.52	.00
1343.50	9.69	9.69	9.69	9.69	9.71
1344.00	16.40	16.40	16.40	16.40	16.44
1344.50	24.27	24.27	24.27	24.27	24.27
1345.00	32.66	32.66	32.66	32.66	32.66
1345.50	40.72	40.72	40.72	40.72	40.72
1346.00	47.43	47.43	47.43	47.43	47.43
1346.50	51.97	51.97	51.97	51.97	51.97
1347.00	56.26	56.26	56.26	56.26	56.26

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft 1343.50	TW,ft 1344.00	TW,ft 1344.50	TW,ft 1345.00	TW,ft 1345.50
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	-9.32	-15.62	-22.55	-29.11	-35.07
1342.50	-9.32	-15.62	-22.55	-29.11	-35.07
1343.00	-9.32	-15.62	-22.55	-29.11	-35.07
1343.50	.00	-14.97	-22.55	-29.11	-35.07
1344.00	15.73	.00	-19.98	-28.51	-35.04
1344.50	24.17	21.09	.00	-22.70	-31.97
1345.00	32.61	31.18	23.63	.00	-23.37
1345.50	40.72	39.75	33.06	23.36	.00
1346.00	47.43	46.65	40.47	33.04	23.36
1346.50	51.97	51.45	46.72	40.46	33.03
1347.00	56.26	56.05	52.23	46.72	40.45

Type.... E-Q-TW Series
Name.... E-Q-TW 10

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft	TW,ft	TW,ft	TW,ft	TW,ft
	1346.00	1346.50	1347.00	.00	.00
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	-40.58	-45.73	-50.52	.00	.00
1342.50	-40.58	-45.73	-50.52	.00	.00
1343.00	-40.58	-45.73	-50.52	.00	.00
1343.50	-40.58	-45.73	-50.52	.00	.00
1344.00	-40.58	-45.73	-50.52	.00	.00
1344.50	-39.05	-45.01	-50.28	.00	.00
1345.00	-33.04	-40.46	-46.73	.00	.00
1345.50	-23.37	-33.04	-40.46	.00	.00
1346.00	.00	-23.37	-33.04	.00	.00
1346.50	23.36	.00	-23.37	.00	.00
1347.00	33.03	23.35	.00	.00	.00

Type.... E-Q-TW Series
Name.... E-Q-TW 10

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft .00	TW,ft .00	TW,ft .00	TW,ft .00	TW,ft
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	.00	.00	.00	.00	
1342.50	.00	.00	.00	.00	
1343.00	.00	.00	.00	.00	
1343.50	.00	.00	.00	.00	
1344.00	.00	.00	.00	.00	
1344.50	.00	.00	.00	.00	
1345.00	.00	.00	.00	.00	
1345.50	.00	.00	.00	.00	
1346.00	.00	.00	.00	.00	
1346.50	.00	.00	.00	.00	
1347.00	.00	.00	.00	.00	

Type.... E-Q-TW Series
Name.... E-Q-TW 10

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft	TW,ft	TW,ft	TW,ft	TW,ft
	1334.00	1334.50	1335.00	1335.50	1336.00
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	.00	.00	.00	.00	.00
1342.50	1.18	1.18	1.18	1.18	1.18
1343.00	4.51	4.51	4.51	4.51	4.51
1343.50	9.69	9.69	9.69	9.69	9.69
1344.00	16.40	16.40	16.40	16.40	16.40
1344.50	24.27	24.27	24.27	24.27	24.27
1345.00	32.66	32.66	32.66	32.66	32.66
1345.50	40.72	40.72	40.72	40.72	40.72
1346.00	47.43	47.43	47.43	47.43	47.43
1346.50	51.97	51.97	51.97	51.97	51.97
1347.00	56.26	56.26	56.26	56.26	56.26

Type.... E-Q-TW Series
Name.... E-Q-TW 10

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft 1336.50	TW,ft 1337.00	TW,ft 1337.50	TW,ft 1338.00	TW,ft 1338.50
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	.00	.00	.00	.00	.00
1342.50	1.18	1.18	1.18	1.18	1.18
1343.00	4.51	4.51	4.51	4.51	4.51
1343.50	9.69	9.69	9.69	9.69	9.69
1344.00	16.40	16.40	16.40	16.40	16.40
1344.50	24.27	24.27	24.27	24.27	24.27
1345.00	32.66	32.66	32.66	32.66	32.66
1345.50	40.72	40.72	40.72	40.72	40.72
1346.00	47.43	47.43	47.43	47.43	47.43
1346.50	51.97	51.97	51.97	51.97	51.97
1347.00	56.26	56.26	56.26	56.26	56.26

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft	TW,ft	TW,ft	TW,ft	TW,ft
	1339.00	1339.50	1340.00	1340.50	1341.00
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	.00	.00	.00	.00	.00
1342.50	1.18	1.18	1.18	1.18	1.18
1343.00	4.51	4.51	4.51	4.51	4.51
1343.50	9.69	9.69	9.69	9.69	9.69
1344.00	16.40	16.40	16.40	16.40	16.40
1344.50	24.27	24.27	24.27	24.27	24.27
1345.00	32.66	32.66	32.66	32.66	32.66
1345.50	40.72	40.72	40.72	40.72	40.72
1346.00	47.43	47.43	47.43	47.43	47.43
1346.50	51.97	51.97	51.97	51.97	51.97
1347.00	56.26	56.26	56.26	56.26	56.26

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft	TW,ft	TW,ft	TW,ft	TW,ft
	1341.40	1341.50	1342.00	1342.50	1343.00
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	.00	.00	.00	-1.10	-4.34
1342.50	1.18	1.18	1.19	.00	-4.34
1343.00	4.51	4.51	4.51	4.52	.00
1343.50	9.69	9.69	9.69	9.69	9.71
1344.00	16.40	16.40	16.40	16.40	16.44
1344.50	24.27	24.27	24.27	24.27	24.27
1345.00	32.66	32.66	32.66	32.66	32.66
1345.50	40.72	40.72	40.72	40.72	40.72
1346.00	47.43	47.43	47.43	47.43	47.43
1346.50	51.97	51.97	51.97	51.97	51.97
1347.00	56.26	56.26	56.26	56.26	56.26

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft 1343.50	TW,ft 1344.00	TW,ft 1344.50	TW,ft 1345.00	TW,ft 1345.50
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	-9.32	-15.62	-22.55	-29.11	-35.07
1342.50	-9.32	-15.62	-22.55	-29.11	-35.07
1343.00	-9.32	-15.62	-22.55	-29.11	-35.07
1343.50	.00	-14.97	-22.55	-29.11	-35.07
1344.00	15.73	.00	-19.98	-28.51	-35.04
1344.50	24.17	21.09	.00	-22.70	-31.97
1345.00	32.61	31.18	23.63	.00	-23.37
1345.50	40.72	39.75	33.06	23.36	.00
1346.00	47.43	46.65	40.47	33.04	23.36
1346.50	51.97	51.45	46.72	40.46	33.03
1347.00	56.26	56.05	52.23	46.72	40.45

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft	TW,ft	TW,ft	TW,ft	TW,ft
	1346.00	1346.50	1347.00	.00	.00
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	-40.58	-45.73	-50.52	.00	.00
1342.50	-40.58	-45.73	-50.52	.00	.00
1343.00	-40.58	-45.73	-50.52	.00	.00
1343.50	-40.58	-45.73	-50.52	.00	.00
1344.00	-40.58	-45.73	-50.52	.00	.00
1344.50	-39.05	-45.01	-50.28	.00	.00
1345.00	-33.04	-40.46	-46.73	.00	.00
1345.50	-23.37	-33.04	-40.46	.00	.00
1346.00	.00	-23.37	-33.04	.00	.00
1346.50	23.36	.00	-23.37	.00	.00
1347.00	33.03	23.35	.00	.00	.00

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft	TW,ft	TW,ft	TW,ft	TW,ft
	.00	.00	.00	.00	
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	.00	.00	.00	.00	
1342.50	.00	.00	.00	.00	
1343.00	.00	.00	.00	.00	
1343.50	.00	.00	.00	.00	
1344.00	.00	.00	.00	.00	
1344.50	.00	.00	.00	.00	
1345.00	.00	.00	.00	.00	
1345.50	.00	.00	.00	.00	
1346.00	.00	.00	.00	.00	
1346.50	.00	.00	.00	.00	
1347.00	.00	.00	.00	.00	

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft	TW,ft	TW,ft	TW,ft	TW,ft
	1334.00	1334.50	1335.00	1335.50	1336.00
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	.00	.00	.00	.00	.00
1342.50	1.18	1.18	1.18	1.18	1.18
1343.00	4.51	4.51	4.51	4.51	4.51
1343.50	9.69	9.69	9.69	9.69	9.69
1344.00	16.40	16.40	16.40	16.40	16.40
1344.50	24.27	24.27	24.27	24.27	24.27
1345.00	32.66	32.66	32.66	32.66	32.66
1345.50	40.72	40.72	40.72	40.72	40.72
1346.00	47.43	47.43	47.43	47.43	47.43
1346.50	51.97	51.97	51.97	51.97	51.97
1347.00	56.26	56.26	56.26	56.26	56.26

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft 1336.50	TW,ft 1337.00	TW,ft 1337.50	TW,ft 1338.00	TW,ft 1338.50
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	.00	.00	.00	.00	.00
1342.50	1.18	1.18	1.18	1.18	1.18
1343.00	4.51	4.51	4.51	4.51	4.51
1343.50	9.69	9.69	9.69	9.69	9.69
1344.00	16.40	16.40	16.40	16.40	16.40
1344.50	24.27	24.27	24.27	24.27	24.27
1345.00	32.66	32.66	32.66	32.66	32.66
1345.50	40.72	40.72	40.72	40.72	40.72
1346.00	47.43	47.43	47.43	47.43	47.43
1346.50	51.97	51.97	51.97	51.97	51.97
1347.00	56.26	56.26	56.26	56.26	56.26

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft	TW,ft	TW,ft	TW,ft	TW,ft
	1339.00	1339.50	1340.00	1340.50	1341.00
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	.00	.00	.00	.00	.00
1342.50	1.18	1.18	1.18	1.18	1.18
1343.00	4.51	4.51	4.51	4.51	4.51
1343.50	9.69	9.69	9.69	9.69	9.69
1344.00	16.40	16.40	16.40	16.40	16.40
1344.50	24.27	24.27	24.27	24.27	24.27
1345.00	32.66	32.66	32.66	32.66	32.66
1345.50	40.72	40.72	40.72	40.72	40.72
1346.00	47.43	47.43	47.43	47.43	47.43
1346.50	51.97	51.97	51.97	51.97	51.97
1347.00	56.26	56.26	56.26	56.26	56.26

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft	TW,ft	TW,ft	TW,ft	TW,ft
	1341.40	1341.50	1342.00	1342.50	1343.00
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	.00	.00	.00	-1.10	-4.34
1342.50	1.18	1.18	1.19	.00	-4.34
1343.00	4.51	4.51	4.51	4.52	.00
1343.50	9.69	9.69	9.69	9.69	9.71
1344.00	16.40	16.40	16.40	16.40	16.44
1344.50	24.27	24.27	24.27	24.27	24.27
1345.00	32.66	32.66	32.66	32.66	32.66
1345.50	40.72	40.72	40.72	40.72	40.72
1346.00	47.43	47.43	47.43	47.43	47.43
1346.50	51.97	51.97	51.97	51.97	51.97
1347.00	56.26	56.26	56.26	56.26	56.26

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft 1343.50	TW,ft 1344.00	TW,ft 1344.50	TW,ft 1345.00	TW,ft 1345.50
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	-9.32	-15.62	-22.55	-29.11	-35.07
1342.50	-9.32	-15.62	-22.55	-29.11	-35.07
1343.00	-9.32	-15.62	-22.55	-29.11	-35.07
1343.50	.00	-14.97	-22.55	-29.11	-35.07
1344.00	15.73	.00	-19.98	-28.51	-35.04
1344.50	24.17	21.09	.00	-22.70	-31.97
1345.00	32.61	31.18	23.63	.00	-23.37
1345.50	40.72	39.75	33.06	23.36	.00
1346.00	47.43	46.65	40.47	33.04	23.36
1346.50	51.97	51.45	46.72	40.46	33.03
1347.00	56.26	56.05	52.23	46.72	40.45

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft	TW,ft	TW,ft	TW,ft	TW,ft
	1346.00	1346.50	1347.00	.00	.00
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	-40.58	-45.73	-50.52	.00	.00
1342.50	-40.58	-45.73	-50.52	.00	.00
1343.00	-40.58	-45.73	-50.52	.00	.00
1343.50	-40.58	-45.73	-50.52	.00	.00
1344.00	-40.58	-45.73	-50.52	.00	.00
1344.50	-39.05	-45.01	-50.28	.00	.00
1345.00	-33.04	-40.46	-46.73	.00	.00
1345.50	-23.37	-33.04	-40.46	.00	.00
1346.00	.00	-23.37	-33.04	.00	.00
1346.50	23.36	.00	-23.37	.00	.00
1347.00	33.03	23.35	.00	.00	.00

File.... F:\HYDRO\PROJECTS\FALCON FALLS 3RD\TABLE.EQT

Elevation - Outflow - Tailwater (ICPR Rating Table)

TW Elevs. --->	TW,ft	TW,ft	TW,ft	TW,ft	TW,ft
	.00	.00	.00	.00	
HW Elev,ft	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs	Flow, cfs
1342.00	.00	.00	.00	.00	
1342.50	.00	.00	.00	.00	
1343.00	.00	.00	.00	.00	
1343.50	.00	.00	.00	.00	
1344.00	.00	.00	.00	.00	
1344.50	.00	.00	.00	.00	
1345.00	.00	.00	.00	.00	
1345.50	.00	.00	.00	.00	
1346.00	.00	.00	.00	.00	
1346.50	.00	.00	.00	.00	
1347.00	.00	.00	.00	.00	

Index of Starting Page Numbers for ID Names

----- E -----
E-Q-TW 10... 6.08, 6.15, 6.01

----- P -----
POND... 5.01

----- S -----
SCS UH 10 2y24h... 4.01, 4.02, 4.03
SCS UH 20 2y24h... 4.04, 4.05, 4.06
Sedgwick24... 2.01, 2.02, 3.01, 3.03, 3.05

----- W -----
Watershed... 1.01