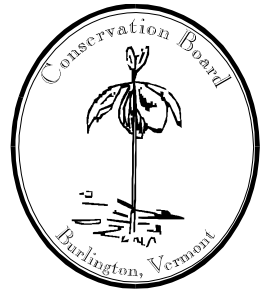


## **Burlington Conservation Board**

149 Church Street  
Burlington, VT 05401  
<http://www.burlingtonvt.gov/planning/>  
Telephone: (802) 865-7188  
(802) 865-7195 (FAX)

*Matt Moore, Chair  
Will Flender, Vice Chair  
Scott Mapes  
Don Meals  
Jeff Severson  
Miles Waite  
Damon Lane  
Zoe Richards  
Stephanie Young*



### **Conservation Board Meeting Public Notice**

June 5, 2017 at 5:30 PM  
Planning and Zoning Conference Room - City Hall Lower Level  
149 Church Street

#### **Agenda**

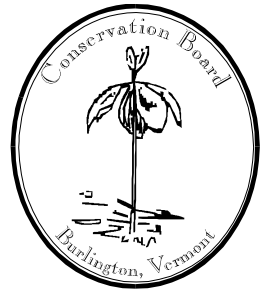
- I. Minutes (5:30)** – Accept minutes from May 1, 2017 meeting
- II. Board Comment (5:35)**
- III. Public Comment (5:40)**
- IV. Open Space Subcommittee (5:45)**
- V. Project Review (6:00)**
  - 1. 17-1097CA/MA; 79 Industrial Pkwy (Ward 5S, ELM) Rhino Foods, Inc.**  
Construct two building additions, 14,200 sf of building footprint, paving of an existing parking lot, construction of a new parking lot, access drive, and stormwater system, and associated site grading.
- VI. Update & Discussion (6:30)**
  - 1. Conservation trails initiative**
  - 2. FY '17 Annual report**
- VII. Adjournment (7:00)**

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## Burlington Conservation Board

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## Conservation Board Meeting Minutes

Monday, May 1, 2017 – 5:30 pm

Planning & Zoning Conference Room – City Hall Lower Level  
149 Church Street

### Attendance

- **Board Members:** Zoe Richards (ZR), Jeff Severson (JS), Stephanie Young (SY), Matt Moore (MM), Miles Waite (MW), Scott Mapes (SM),
- **Absent:** Don Meals (DM), Damon Lane (DL), Will Flender (WF)
- **Public:** None
- **Staff:** Scott Gustin (Planning & Zoning), Jenna Calvi (DPW), Dan Cahill (Parks & Rec)

MM, Chair, called the meeting to order at 5:30 p.m.

### Minutes

Minutes of April 3, 2017

JS noted on pg. 2, 5<sup>th</sup> paragraph from the bottom, “JS” should be “SM.”

A MOTION made by MW and SECONDED by SM:

Accept the minutes of April 3, 2017 as corrected.

Vote: 6-0-0

### Board Comment

MM noted an upcoming conference relating to soil contaminants in VT. MW elaborated. It's being hosted by VT Environmental Consortium and VT DEC. New state rules and guidelines are underway. It is May 25 at VT Technical College.

ZR mentioned a conference coming up at Burke related to economic benefits of trails.

### Public comment

None.

### Open Space Subcommittee

#### 1. Conservation Legacy Fund pre-application

MM noted the meeting and discussion of the Elks property. Dan Cahill said that there have been ongoing discussions with Elks and stakeholders of surrounding properties talking about the Arms forest generally - speaking of it as a contiguous forest rather than parcel-by-parcel. The Elks are looking to take on a capital funding campaign. Conservation may be part of the mix. Mr. Cahill noted the presence of trails within the forest across property lines. Fellowship of the Wheel has engaged in the discussions in light of the bike use of the trails. A pre-acquisition request of BCLF monies is likely if conservation efforts are pursued. MM said that with the preliminary approval in place, the BCLF would cover a portion of the expenses. ZR said she'd like to get to a place where we have defined priorities. There was discussion as to staff time and whether that's an expense that should be covered. MM said a budget would be put together in the coming month. ZR pointed out that WVPD does not request expenses for staff time. MM

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For accessibility information call 865-7188 (865-7142 TTY).



said he wants to be supportive and make things happen. MW, are we trying to streamline things? MM, yes. He'd rather have Dan Cahill spend time speaking to stakeholders than have him here requesting support at every step. SM, he thinks the Board is flexible enough to do this. MM said he's really motivated to pursue this trails initiative. We should have already had the conversations with the various stakeholders. MW said that a set amount of money could be set aside within the fund for pre-acquisition monies. ZR asked if the pre-acquisition monies should be limited to use by Parks & Rec. JS said that priority areas should benefit from a more streamlined process. ZR said we should set our priorities at our next meeting. Mr. Cahill said this all leads back to improved strategic planning.

JS said he had some mixed feelings about the last funding request from LCLT. It resulted in providing funding for activities even if nothing is ultimately conserved. This should not set precedent; we should limit doing so again in the future. MM agreed that we should be more strategic as to how the monies are used.

Mr. Cahill said that staff reports providing background and explanation would be helpful.

JS said of the entire fund, we need to figure out how much should be used for staff beyond that which pays for the Land Steward position.

MM, if anyone else wants to come to the open space subcommittee meetings, they are welcome to.

ZR pointed out that the BCLF is seed money for conservation.

### **Update & Discussion**

#### **1. Conservation News Letter**

MM noted that DL wrote a piece recently. Mr. Cahill said that a sign-up will be put together. It reaches out two years. He'll be asking Board members to write pieces for the newsletter. SY said she'd do something for July.

#### **2. Conservation trails initiative**

ZR said that a resolution has been drafted for Council action in June. Richard Dean will sponsor the resolution. MM said he and ZR have met with Parks & Rec and city councilors to provide context and rationale. MM said that the item will be up for discussion with the Parks Commission tomorrow night. ZR said that John Bossange has been an emerging partner in conservation efforts. It's great that he's on the Parks Commission. Mr. Cahill said that he's involved with a number of stakeholders. SY asked about the walk/bike master plan. ZR, it's really a streetscape plan. It's not that relevant to what we're looking to do with this trails initiative. As we work to improve trails, we need to manage them as cohesive places with user experience in mind. MW, how will folks know this is going on? Mr. Cahill said that it will be in the next conservation newsletter. JS, maybe there should be a press release. ZR mentioned the need to host a summit of property owners and other stakeholders. Doing so is key to move ahead on the ground. MM pointed out the role of the BCLF in securing lands and easements to improve connectivity in the city's trails network. SM said that it's important in providing momentum for the effort. MM solicited suggestions for revisions to the draft resolution. SY suggested providing a title to the resolution. SY also suggested relocation of the summit item so it does not come across as the primary focus on the resolution. Mr. Cahill suggested getting some folks to speak publicly in support of the resolution at the City Council meeting. SM said he'd review the resolution and provide recommendations.

#### **3. Stormwater/EPSC**

SG provided overview of the progression of stormwater conditions and standards. SM gave further background. He's observed that some things are not happening at some project sites. He noted at Eagles Landing that vehicles are parking on the green belt and impacting it. Jenna Calvi said she had received a couple of complaints. SM said he spoke with John Caulo about the project. The problem has been remedied, but there was about a 1 week gap wherein the site was not stabilized. SM thought there were still standing zoning conditions related to stormwater and EPSC. He also noted 1 Burlington Square. He said that the site lacks common BMP's. The approved project plans demonstrate them, but they've not been put in place. Ms. Calvi said that standard conditions won't solve the problem. Commonly, site inspections turn up problems. Inspections are key, and she's trying to get to more of them. SM asked if

there's a protocol that problems can be brought to the project engineer and/or contractor. Ms. Calvi said the normal course of action is to arrive onsite unannounced and do an inspection. Point out problems and note that correction is needed within a set period of time. She said that she or Greg Johnson are the ones to contact for complaints. MM asked about project approvals. Ms. Calvi said that the project plans are reviewed for compliance. Plan sheets articulate the conditions. SM said that the conditions that the Board articulated are not verbatim on the engineer's plans. Ms. Calvi said she's happy to implement conditions that the BCB wants to see. She also said she's making a practice of holding off on final approval until reviewed by Conservation Board and DRB in the event recommendations are made. SM said that if we're specifically concerned about something in a project, we need to make it part of our approval. MM, what if we want to ensure that something is written into the permit? Ms. Calvi, if there are project specific conditions, send them to her.

**Adjournment**

The meeting adjourned at 6:55 PM.



RECEIVED  
MAY 09 2017

DEPARTMENT OF  
PLANNING & ZONING

May 9, 2017

Scott Gustin  
City of Burlington Planning and Zoning  
149 Church Street  
Burlington, VT 05401

Subject: **14,200 sf Building Expansion: 79 Industrial Parkway, Burlington,  
Request for local Review**

Dear Scott:

Please find enclosed a Zoning Permit Application for the above captioned project. The project involves the construction of two building additions totaling approximately 14,200 sf of building footprint with site improvements including paving of an existing car parking lot, construction of a new parking lot, fire access drive, and stormwater system, as well as associated site grading. The project parcel is recorded in the City of Burlington records as lot 060-1-062-000. This property's deed is recorded in book 933, page 5 in the city land records. The existing building use is food processing; there is no change in use proposed. There are no sales of goods at this facility. The City of Burlington has designated the parcel as being part of the Enterprise Light Manufacturing zoning district and in the Design Review overlay district.

Due to the estimated construction cost of the project, this project requires a COA Level II review. Additionally, this project involves a development footprint greater than twenty thousand sf and therefore is considered a Major Impact project which requires review under the Major Impact Review.

As part of the Major Impact Review, the project was presented at the February 16, 2017 neighborhood planning assembly meeting for Ward 5. The neighborhood affidavit, meeting sign-in, relevant meeting minutes, and notification to abutting property owners are included with this permit application.

**Citywide General Regulations:**

1. Uses and Structures:

The existing and proposed use of the project parcel is food processing which is a permitted use in the Enterprise- Light Manufacturing zoning district. There is only one principal structure on this lot and it is that structure on which two additions are proposed to be constructed. There is one accessory structure, a shed approximately 50 sf, located on the lot that is proposed to be relocated.

2. Dimensional Requirements:

a. There are no proposed changes to property lines, lot size, or lot frontage. The existing parcel is in conformance with the district dimensional standards. Below is a table of allowed and proposed conditions:

Surveying

Permitting

Site Design

Subdivisions

Timber Design

Expert Testimony

Site Development

Act 250 Permitting

Forensic Engineering

Environmental Permitti

Transportation Engine

Structural Inspection S

Commercial Building D

Construction Oversigh

Building Assessment

Pedestrian Bridges

Stream Alterations

Sewer Design

Water Supply

Storm Water

Hydrology

Grading

317 River Street

P. O. Box 1576

Montpelier, VT

05601-1576

phone: 802.223.4727

fax: 802.223.4740

www.dirtsteel.com

|                  | Allowed                  | Proposed      |
|------------------|--------------------------|---------------|
| Lot Coverage     | 80%                      | 52%           |
| Front Setback    | 5 feet                   | Over 120 feet |
| Side Setback     | 0 feet                   | Over 20 feet  |
| Rear Setback     | 10% of lot depth = 50.6' | Over 110 feet |
| Max Height       | 45 feet                  | 26 feet       |
| Floor Area Ratio | 2.0                      | 0.21          |

- b. The existing structure and proposed additions have multiple roof heights and styles. The tallest building roof is less than 28' in height. On average the heights measured from ground surface to either the mid-rise in peak of the roof or to the top of the flat roof are between 16' and 23' tall. The proposed building additions heights vary. The southern building addition, which holds the office and amenity space, has a height of approximately 23'. The western building addition, which will be food processing related space, is approximately 26' in height. Elevations of the ground surface around the building are generally within 1' of finished floor resulting in a height, as defined by the City of Burlington Comprehensive Development Ordinance, ranging from 23' to 26'. There will be two loading dock areas where the ground surface will be four feet below the finished floor elevation.

- c. Lot Coverage is broken out in the following table:

| Cover Type                      | Existing      | Proposed       |
|---------------------------------|---------------|----------------|
| Buildings (sf)                  | 29,910        | 44,100         |
| Walkway and Equipment Pads (sf) | 4,860         | 4,600          |
| Gravel and Pavement (sf)        | 48,496        | 63,900         |
| <b>Total Lot Coverage (sf)</b>  | <b>83,895</b> | <b>112,700</b> |
| Lot Size (sf)                   | 218,236       | 218,236        |
| <b>Lot Coverage (%)</b>         | <b>38.4</b>   | <b>51.6</b>    |

3. Non-Conformities: Not applicable; the project does not have any nonconforming components.

#### **Special Use Regulations:**

Not applicable; the project does not have any special uses.

#### **Major Impact Review Standards:**

1. Not result in undue water, air, or noise pollution;

The project will not result in undue water, air, or noise pollution. The project will address stormwater runoff in compliance with the State of Vermont Watershed Management Division regulations. The proposed wastewater will continue to be discharged to the City of Burlington's municipal sewer system and will not increase flows. The wastewater is a combination of domestic wastewater and process wastewater. The process wastewater exits the building to the north and flows through a grease trap. Due to internal proposed plumbing, the proposed configuration splits the process wastewater to both the existing grease trap to the north and to a new grease trap proposed to be located to the south of the warehouse addition.

The proposed project will relocate existing mechanical equipment from the southern side of the building to the roof. The mechanical equipment located on the roof will have full height fencing on all sides so as to not be seen from the street as required in the local regulations. During the first pre-application neighborhood public meeting, there were questions asked regarding the noise levels of the current facility operation and the changes due to the proposed project. Particularly, a high pitched noise is created during filling of the liquid nitrogen tanks. This happens up to twice a day when the



facility is operating and deliveries are scheduled to occur between 8 AM and 8 PM. Another noise concern is the boiler, which is noted to be loud. It was discussed that the boiler is required to heat the water used as part of the sanitation process. Low height landscaping and fencing is proposed along the western property line to help buffer noise from the facility. See sheet L1 for landscaping information.

The City of Burlington does not quantify a sound level threshold that projects must remain under. The Vermont Natural Resources Board does review aesthetics impact of noise and uses a general threshold of 70 dBA (Lmax) at the property line and 55 dBA (Lmax) at surrounding residences and outside areas of frequent human use. A few sound level measurements have been taken at the current facility to get a better idea of the current noise levels. At the edge of the woods along the western property setback line, the readings were generally 50-55 dBA. When the dish room fan was running the range increased to 55- 60 dBA. When the boiler was also running, the noise level rose to 60-65 dBA. Sound levels along the sides of the building were between 45-55 dBA. Along the front of the building where road noise is present the levels were closer to 50-55 dBA.

2. Have sufficient water available for its needs;  
The project does not propose to increase the water demands for this building and the City of Burlington has confirmed the current allocation for 140 employees and process water per the existing State of Vermont Wastewater System and Potable Water Supply Permit. The existing permit has been included as an attachment. The proposed employee count for the building is 125. The majority of this facility's water usage is for the sanitation of process equipment. Currently, the building does not allow for all process equipment to remain set up. After one set of equipment is used, it is cleaned and stored. Then when set back up for use, it must be sanitized. The sanitation water usage will be reduced as the proposed expansion will allow for equipment to remain in place even when not in use and will eliminate the need for double cleaning of equipment.
3. Not unreasonably burden the city's present or future water supply or distribution system;  
The project does not propose to increase the water demands for this building.
4. Not cause unreasonable soil erosion or reduction in the capacity of the land to hold water so that a dangerous or unhealthy condition may result;  
The project proposes to implement erosion prevention and sediment controls during the construction phase of the project. These include the use of a stabilized construction entrance, silt fencing down gradient of disturbed surfaces, stone checkdams, and erosion control matting. Additionally, the number of days disturbed surfaces may remain unstabilized will be restricted to seven. Final surface covers will include established vegetation, compacted gravel, asphalt, concrete, or stone fill, which are resistant to erosion.
5. Not cause unreasonable congestion or unsafe conditions on highways, streets, waterways, railways, bikeways, pedestrian pathways or other means of transportation, existing or proposed;  
There are no railways, waterways, bikeways, pedestrian pathways adjacent to the project parcel. This project does not propose to increase the number of employees or create a significant increase to the expected truck traffic and therefore will not cause unreasonable congestion on Industrial Parkway.
6. Not cause an unreasonable burden on the city's ability to provide educational services;  
The proposed project will not increase the number of employees and therefore there will be no additional school aged children or burden to the city's educational services.
7. Not place an unreasonable burden on the city's ability to provide municipal services;  
The proposed project will continue to utilize the existing connections to the municipal water and sewer systems and is not proposing to increase the flows for the site. A request for review of this project has been sent to Mayor Weinberger with regard to impacts on municipal services for the Act 250 permitting process. Other request letters were written directly to the fire marshal, police chief, parks and recreation, and the department of public works. Copies of the letters are attached.
8. Not have an undue adverse effect on rare, irreplaceable or significant natural areas, historic or archaeological sites, nor on the scenic or natural beauty of the area or any part of the city;



This site is an existing food processing facility and is located in an industrial area. This project parcel does not contain any known historic or archaeological sites. A letter has been written to the State of Vermont Historic Preservation requesting confirmation that the site does not contain items of significance. The project parcel does contain Class III wetlands that are non-jurisdictional for the State of Vermont. The wetlands have been delineated and will require a Category 1 notification under the Vermont General Permit through the Army Corps of Engineers. The permit application is required to be sent a minimum of two weeks prior to the start of construction, after a contractor has been selected. The wetlands are not designated on the City of Burlington's Natural Resource Protection District Map 4.5.4-1.

9. Not have an undue adverse effect on the city's present or future growth patterns nor on the city's fiscal ability to accommodate such growth, nor on the city's investment in public services and facilities;  
The project is located in an industrial area and will expand the existing food processing facility which is a permitted use in the Enterprise Light Manufacturing zoning district for the City of Burlington. The project will utilize the city's existing street and municipal utility services but will not create an undue burden on those current services. Additionally, the development will add to the tax base.
10. Be in substantial conformance with the city's municipal development plan and all incorporated plans;

**Municipal Plan:**

- a. Land Use: This project directly conforms to the land use policies by protecting natural areas and increasing the density of development in the Enterprise District.
- b. Natural Environment: This project directly conforms to the Natural Environment policies by protecting natural resources from degradation.
- c. Built Environment: This project directly conforms to the Built Environment policies by not reducing scenic views, historic buildings, or pedestrian experiences.
- d. Historic Preservation: This project will have no impacts under this portion of the plan.
- e. Transportation: This project will have no impacts under this portion of the plan.
- f. Economic Development: This project directly conforms to the Economic Development Plan by creating further development within the Enterprise district.
- g. Community Facilities and Services: This project will have no impacts under this portion of the plan.
- h. Energy: This project will have no impacts under this portion of the plan.
- i. Housing: This project will have no impacts under this portion of the plan.
- j. Education: This project will have no impacts under this portion of the plan.

**Regional plan:**

The Chittenden County ECOS Plan indicates "Enterprise Planning Areas are areas where local zoning authorizes a future concentration of employment uses that attract workers from the County and multi-county region. Development in these Planning Areas should have adequate wastewater capacity and access to transit or be near these services. Typically, this area encompasses major employers or a cluster of single employers and has current or planned transit service." The project improves the ability of the company to meet their clients' demands, increases economic stability of the facility, and improves employee climate. It also promotes public transport by offering incentives. The project is an industrial use which supports the surrounding community as outlined in the plan. The area is served by municipal water and sewer.

There are four broad goals described in the Plan; Natural Systems; Social Community; Economic Infrastructure; and Built Environment. The project is infill of the current development on-site and minimizes disturbance to natural areas. The project increases the economic prosperity of the company which will directly or indirectly increase the prosperity of the area. These both are in line with the goals of the plan.

11. Not have an undue adverse impact on the present or projected housing needs of the city in terms of amount, type, affordability and location:



The project is not a residential project nor is additional housing needed as a result of this project. There are no new employees proposed for this project.

12. Not have an undue adverse impact on the present or projected park and recreation needs of the city. This project is not located adjacent to an existing or currently proposed city park. There will be no increase in employees due to the proposed project.

13. Days and hours of operation:

This facility operates 24 hours per day, 6 days per week.

14. Employees:

There are currently 125 employees and there are no new employees proposed.

15. Traffic Generation is displayed in the following table. The trip traffic was determined using the Institutes of Traffic Engineers Trip Generation Report 7<sup>th</sup> Edition, Category 140 for Manufacturing, using the proposed 125 employees as the basis for calculating the trips. The expected truck traffic is 14 deliveries or shipments per day, across two eight hour shifts, generally between 8AM and 8PM.

|                       | Number of Trips |
|-----------------------|-----------------|
| Weekday Trips         | 465             |
| Weekday AM Peak Trips | 66              |
| Weekday PM Peak Trips | 71              |

A conservative approach has been taken by using the full employee count as the basis of determination even though the employee count is split across 24 hours. Since there is no increase in employees proposed, there will not be additional traffic impacts from the project.

#### **District Specific Regulations:**

##### **Wetland Conservation Zone**

Under the City of Burlington, VT Comprehensive Development Ordinance, the Natural Resource Protection Overlay District consists of areas delineated on Map 4.5.4-1. This map does not indicate the presence of any natural resources within the project parcel. An existing wetland within the project area was delineated in on July 7, 2016 by Dori Barton of Arrowwood Environmental, LLC, and was found to be directly related to the roadside ditch along Industrial Parkway. The disturbance to the wetland is limited in area and will be properly permitted with the Army Corps of Engineers. The State of Vermont has provided written documentation indicating that the wetland is designated Class III. This documentation is attached to this application. It was determined that the wetland does not provide function or value that is significant enough to merit protection under the Vermont Wetland Rules at this time.

#### **Performance Standards:**

1. Nuisance Regulations:

During construction, if excessively loud equipment is required, the work will be restricted from occurring on Sunday or between the hours of 5:30 pm and 7:00 am except in emergency situations. During construction of this project, appropriate measures will be used to control dust and dirt. After construction, the site surfaces will be vegetated, gravel, or paved and there will not be activities which will cause offensive dust and dirt. There will be no noxious gases or vibrations created by this project. There will be no fire, explosion, or safety hazards created by this project. There will be no burying or seepage into the ground of material which endangers any person or cause injury to property, plants or animals due to this project. Current operations at the facility do include two items that generate significant noise levels. The first is the filling of the liquid nitrogen tanks, which creates a high pitched noise. The owner has modified the delivery hours to be between 8 AM and 8 PM to reduce disturbance to abutting properties. The other significant noise is the boiler which heats the water that is used in the sanitation process. Current noise level measurements are discussed above in the Major Impact Review Standards section.

2. Outdoor Lighting:

Twelve (12) new LED cutoff style lighting fixtures are being added to supplement the existing fixtures on the exterior of the new building and parking lot construction areas. All fixtures are dark



sky friendly approved fixtures as manufactured by RAB Lighting. Control of fixtures will be by photo cell and motion sensor for security fixtures.

Locations and types are indicated on the attached drawings and fixture cuts. To summarize, there will be:

- a) 5 new building lights, mounted on new additions, 3 at 21.1 watt/ea on south wall, and 2 at 14.8 watt/ea on east and west walls, all mounted at 15' AFG
- b) 4 new pole mounted lights, 78.6 watt/ea, 2 at south parking and 2 at east parking, all mounted 16' AFG (including light base)
- c) 1 new pole light at the new west side employee entrance, 71.9 watt/ea. mounted 16' AFG
- d) 2 new bollard style lights, 22.1 watts/ea. Located at the west office main entry, both mounted at 3.5' AFG. Total new fixtures wattage equals 523.4 watts.

The average illuminance in the new lighting area is 0.36 foot-candle. See photometric plan, rendering, and calculation summary included in this application.

### 3. Stormwater and Erosion Control:

The project will be required to obtain an Individual Stormwater Permit through the State of Vermont Watershed Management Division. The lot generally drains from southwest to northeast toward the roadside ditch along Industrial Parkway. The stormwater system was designed to treat the runoff from the new impervious areas on the project site. Stormwater runoff from portions of rooftops, drives, and parking flow via overland to a grass treatment channel. Portions of rooftops and pavement are conveyed via closed drainage piping. Both are routed to a wet pond with pre-treatment forebay. The wet pond has a controlled outlet structure and stabilized outfall to the roadside ditch along Industrial Parkway. The ditch is part of the Burlington stormwater system that drains to Lake Champlain. The following table shows the peak stormwater discharges from the lot in the current condition and the proposed conditions.

|       | Current Conditions |                | Proposed Conditions |                |
|-------|--------------------|----------------|---------------------|----------------|
| Storm | Discharge (cfs)    | Volume (ac-ft) | Discharge (cfs)     | Volume (ac-ft) |
| 1-yr  | 7.09               | 1.12           | 4.89                | 1.26           |
| 10-yr | 15.30              | 2.28           | 10.88               | 2.46           |

Stormwater models required as part of the state permitting process have been included as an enclosure with this application.

This project is designed to be in conformance with the Vermont State Construction General Permit 3-9020 and is considered a low-risk project.

- a. Erosion control measures to be employed during construction include silt fence placed down gradient of all disturbed areas, erosion control matting placed on all slopes greater than 10% (1V:10H) and in all areas of concentrated runoff, check dams in swales to promote the settling of sediment and infiltration, and a stabilized construction entrance to prevent the tracking of sediment onto Industrial Parkway.
- b. Permanent erosion control measures will include stabilized surfaces (e.g. established vegetated areas, pavement, and gravel surfaces).

### 4. Tree Removal:

This project will require the removal of trees in an area of approximately 7,300 sf. The removal of these trees are required to construct the western building addition, an access drive around the building, a treatment channel for stormwater runoff, and grading to match existing elevations. The existing birch tree and white pine located off the southeastern building corner will need to be removed to accommodate the new building addition and stormwater pond, respectively. A planting bed is proposed for the area in front of the building adjacent to the patio. The planting area is expected to have spring bulbs, hydrangeas, hosta, clethra, and other low maintenance perennials.



Twelve 12' tall American Arborvitae trees and eight 4' tall American Arborvitae trees will be relocated as part of this project. There are 30 new trees and 18 new shrubs proposed to be planted. Nine of the new shrubs will be planted between the entrance drive and the stormwater pond and one will be in front of the new building addition. The remaining shrubs and trees (including the relocated trees) will be planted along the limits of disturbance along the western side of the building. The new trees are proposed to be a mix of ash, honey locust, oak, and fir trees. See the attached landscaping plan for a planting schedule.

**Development Review Standards:**

1. Land Division Design Standards: Not applicable; this project does not proposed to divide land.
2. Site Plan Design Standards:
  - a. Natural features: There will be some trees removed to accommodate the proposed project. Most of the trees to be cut are part of a bulb out off of the main strip of trees that run along the property line. New trees will be planted to reestablish a visual screen between the abutting residential development and the building expansion. The current trees are mature with little to no low branches. The new plantings will help fill in the screening at areas closer to the ground where the mature trees no longer provide dense screening.

There is a Class III Wetland located on the project parcel that will be disturbed as part of this project. According to the State of Vermont, the wetlands do not provide function or value significant enough to warrant protection under the Vermont rules.

The project includes a new stormwater system to treat stormwater runoff and prevent sedimentation downstream.

- b. Topographical alterations: The site grading required for this project will includes slopes of 3H:1V or flatter. The overall stormwater flow path of the site will not be altered as part of this project. All disturbed surfaces will be monitored for erosion until stabilization is achieved. The finished surface covers in the areas disturbed by this project include asphalt, concrete, compacted gravel, stone, and established vegetation. The only new retaining wall located on the site will be at the loading dock and will not exceed three feet in height.
    - c. Public Views: Not applicable; there are no public scenic views that will be minimized by this project.
    - d. Cultural Resources: This project proposes to create building additions within the limits of previous project disturbance. There are no noted archeological sites on the project parcel.
    - e. Renewable Energy Resources: The majority of the facility needs to have a regulated temperature and therefore does not utilize solar heating. The new amenity space for employees will be on the south eastern side of the existing building. Much of the façade will be glass which will utilize the natural sunlight for both lighting and heat. The neighboring building's sun exposure is not reduced due to the existing building or the proposed expansion.
    - f. Brownfield Sites: Not applicable; this project does not involve an area known or suspected to be a brownfield.
    - g. Nature's events: The existing drainage patterns are not significantly modified due to this project. Stormwater runoff will be properly treated and detained to ensure compliance with the State of Vermont applicable requirements.
    - h. Building Location and Orientation: The proposed additions will contain building lines parallel and perpendicular to the existing building and closely parallel and perpendicular to Industrial Parkway. The main entrance will face the street and will be accented by a new pergola, patio, and planting area.
    - i. Vehicular Access: The existing curb cut along Industrial Parkway will continue to provide access to the site. The existing curb cut will be reshaped to be 34' wide with 25' radius flares adjoining Industrial Parkway. This will improve access to the site for delivery vehicles. No additional curb



- cut locations are proposed as part of this project. The site has been designed to allow for full maneuvering and circulation of traffic on-site.
- j. Pedestrian Access: There are no public sidewalks along Industrial Parkway adjacent to the project parcel. The existing concrete sidewalk internal to the site will be reconstructed and will allow pedestrians to collect and be directed to the entrance of the building. A new concrete sidewalk will be constructed along a portion of the southern parking lot and will allow for pedestrians to collect and travel to the main entrance. The existing gravel car parking lot will be paved with bituminous concrete as part of this project. The bituminous concrete will be striped to indicate parking spaces and applicable aisles.
  - k. Accessibility for the Handicapped: Five accessible parking spaces, including one van space, are being created with aisles, paint striping, and signage conforming to ADA standards as part of this project. The accessible spaces are located at the main entrance of the building and will have a sidewalk flush with the parking area to enable ease of access to the building. Bollards will be used as a barrier for the spaces that do not have curbing between the parking and sidewalk surface.
  - l. Parking and Circulation: The project is located in the shared use parking district and its use is food processing. The building has 33,000 sf dedicated to process operations and 12,900 sf dedicated to office space. Based on Article 8: Parking of the Burlington Comprehensive Zoning Ordinance the maximum allowable number of parking spaces is based on 125% of the minimum number of spaces in the Neighborhood parking district. The minimum spaces in the neighborhood district 1.3 spaces/ 1000 gfa for food processing and 2 spaces/1000 gfa for office space. This allows a maximum of 86 parking spaces. In total, the project proposes 86 parking spaces, including four standard accessible spaces and one van accessible space. There are three shifts at the facility. The arrival and departures during the shifts do vary by employee and their respective role at the facility and there will be some overlap between shifts. The parking shown is anticipated to accommodate proposed work force.
- An 18' wide access drive is proposed and will provide access to all four sides of the building. The edges of the parking area are defined by grass depressions and existing and proposed trees. Curbing is not proposed on the exterior of the parking lots to allow for non-concentrated flow of stormwater runoff into the treatment channel.

The site has been designed to allow for on-site turning movements for delivery vehicles. The existing loading space is parallel to Industrial Parkway and there is a fence screening it from the road. The new loading dock is perpendicular to Industrial Parkway to provide for better internal process circulation as well as external truck circulation.

The project is not required to provide long and short term bicycle facilities due to the proposed expansion size. Three new galvanized inverted "u" bicycle racks are proposed to be mounted to a new concrete pad located along the sidewalk on the northern end of the parking lot. Showers and locker rooms have been provided within the building.

- m. Landscaping and Fences: The landscaping plan has taken into consideration the hazards of salt, vehicles, snow removal, and climate factors. Tree cutting is required to accommodate the proposed addition and access drive. Landscaping will be used to screen the building addition from the residential neighbors to the west. Additionally, 8' tall cedar wood board and batten fencing sections that are 24' long will be staggered amongst the proposed plantings along the western property setback line. These fencing sections are being placed to help screen the building and parking from abutting land owners in areas where the tree cutting will occur. A planting bed is proposed adjacent to the parking area and patio in front of the building. In addition, bushes are proposed to be planted between the driveway entrance and the stormwater pond. Shade trees are proposed to be added along the edge of the parking areas. The existing garden fence is proposed



to be relocated to the southwest. An 8' tall cedar wood board and batten fencing and doors are proposed around the two trash compactors on the southern corner of the building.

- n. Public Plazas and Open Space: The project is industrial in nature and does not propose any public plazas or open public spaces.
- o. Outdoor Lighting:  
Twelve (12) new LED cutoff style lighting fixtures are being added to supplement the existing fixtures on the exterior of the new building and parking lot construction areas. All fixtures are dark sky friendly approved fixtures as manufactured by RAB Lighting. Control of fixtures will be by photo cell and motion sensor for security fixtures.

Locations and types are indicated on the attached drawings and fixture cuts. To summarize, there will be:

- a) 5 new building lights, mounted on new additions, 3 at 21.1 watt/ea on south wall, and 2 at 14.8 watt/ea on east and west walls, all mounted at 15' AFG
- b) 4 new pole mounted lights, 78.6 watt/ea, 2 at south parking and 2 at east parking, all mounted 16' AFG (including light base)
- c) 1 new pole light at the new west side employee entrance, 71.9 watt/ea. mounted 16' AFG  
2 new bollard style lights, 22.1 watts/ea. Located at the west office main entry, both mounted at 3.5' AFG.

Total new fixtures wattage equals 523.4 watts. The average illuminance for the proposed lighting is 0.36 foot-candles.

- p. Integrate infrastructure into the design: The project makes use of existing water and wastewater services, existing roadside drainage ditch, and existing access to Industrial Parkway. Industrial Parkway does not have municipal infrastructure such as sidewalks or bike paths. The project site will incorporate a bike rack to promote employee bicycle usage. The project proposes to relocate mechanical equipment from the ground surface along the southern side of the building to the rooftop. New mechanical equipment units will also be roof mounted.

### 3. Architectural Design Standards

- a. Relate development to its environment: The proposed expansion of the existing building will be consistent with the existing building and the industrial park where it is located. A plan sheet "Density Study" shows the proposed appearance of the building as it compares to several of the neighboring buildings. The massing, height, scale, rooflines, and building materials are similar to those of other buildings along the street.
- b. Protection of Architectural resources: This project is not located in a historic area. The area is industrial in nature and will match architectural features of the area.
- c. Protection of public views: There are no public scenic views that will be minimized by this project. Screening will be provided to separate the neighboring residential developments from the building.
- d. Provide an active and inviting street edge: The current street side of the building, while clean and fitting for the area, will be enhanced with the proposed additions. From the street, the building additions will provide greater dimension as the southeast addition will project out from the existing building face and will extend above the existing roofline at the front of the building. The largely glass façade will contrast the existing garage doors and insulated metal panel wall materials to be a focal point. Though there will be trash compactors along the building addition facing the street, those will be screened with 8' tall cedar wood board and batten fencing and doors. Additionally, the surface has a high point between the road and the trash compactors that helps to screen the compactors and minimize their presence.
- e. Quality of materials: See attached material cut sheets and wall sections.
- f. Reduce energy utilization: The majority of the facility needs to have a regulated temperature and therefore does not utilize solar heating. The new amenity space for employees will be on the south eastern side of the existing building. Much of the façade will be glass which will utilize the natural sunlight for both lighting and heat. The neighboring building's sun exposure is not

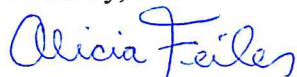


reduced due to the existing building or the proposed expansion. The project will not interfere with the sustainable use of renewable energy resources by diminishing the future availability of such resources or eliminating nearby property owners' access to such resource.

- g. Make advertising features complementary to the site: Advertising space will be kept minimal. The existing sign along the driveway contains only "79" and "Rhino Foods". The sign is a dark metal with white lettering. The existing logo that is on the front of the building will be relocated to be above the front entrance and is proposed to remain the same size and colors.
- h. Integrate infrastructure into the design: The project makes use of existing water and wastewater services, existing roadside drainage ditch, and existing access to Industrial Parkway. Industrial Parkway does not have municipal infrastructure such as sidewalks or bike paths. The project site will incorporate a bike rack to promote employee bicycle usage. The project proposes to relocate mechanical equipment from the ground surface along the southern side of the building to the rooftop. New mechanical equipment units will also be roof mounted.
- i. Make spaces secure and safe: The proposed pavement will have paint markings which will help people follow the order in the parking lot and minimize erratic parking patterns. Outdoor lighting will help illuminate the parking area and other areas on site to help visibility during non-daylight hours. The building will have an access drive to provide access to the rear and side of the building should access be needed by emergency vehicles. The parking and loading areas will provide access to the other sides of the building.

Please contact me if you should have any questions regarding the project or this permit application.

Sincerely,



Alicia Feiler, P.E.

Enclosures

Zoning permit application and Fee check  
Site/Area Photographs  
Existing Water Supply and Wastewater Disposal Permit  
Correspondence with State of Vermont Wetlands  
DPW Erosion Prevention and Sediment Control Plan Questionnaire and Stormwater Management Plan  
Pre-Screening  
Erosion Prevention and Sediment Control Plan narrative  
Operational Stormwater Treatment and Maintenance Plan narrative  
Inspection checklists  
Stormwater Modeling  
Pre-Application Neighborhood Public meeting affidavit and other documentation  
Copies of request for input letters  
Reduced Size Site Plan Set  
Reduced Size Architectural Elevations, floor plan, equipment, wall sections  
Reduced Size Color Rendered Perspective Drawing  
Reduced Size Lighting plans  
Lighting Cut Sheets  
Assorted Cut Sheets  
Full Size Plans

**Alicia Feiler**

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**From:** Ferguson, Andrew <Andrew.Ferguson@vermont.gov>  
**Sent:** Friday, June 24, 2016 10:55 AM  
**To:** Alicia Feiler  
**Cc:** Heath, Tina  
**Subject:** 2016-304

RECEIVED  
MAY 09 2017

DEPARTMENT OF  
PLANNING & ZONING

Dear Alicia,

Please be advised that you have a Class III wetland the property located at 79 Industrial Parkway Burlington VT. This determination is based on a site visit conducted on 6/22/2016, made by Tina Heath and Andrew Ferguson accompanied by Alicia Feiler.

**PRESUMPTION OF SIGNIFICANCE:**

The subject wetland is not mapped on the Vermont Significant Wetland Inventory maps, nor does it meet the presumptions listed in Section 4.6 of the Vermont Wetland Rules.

**FUNCTIONS AND VALUES:**

The Secretary has determined based on an evaluation the wetland that it does not provide function or value that is significant enough to merit protection under the Vermont Wetland Rules at this time. Because wetland character, size and function can change over time, this determination is only valid for five years. If impacts are proposed five years beyond the date of this letter, a permit may be required. I recommend that you have a Wetlands Program Ecologist evaluate the protection status of the wetland at such time. Your town and the Army Corps of Engineers (802-872-2881) may also have regulations pertaining to this wetland.

If you would like to learn more about wetlands or Vermont Wetlands Program please visit our website:  
<http://www.vtwaterquality.org/wetlands.htm>.

Sincerely,

Tina Heath





**Burlington Department of Public Works  
Stormwater Program**

234 Penny Lane (Water Plant)  
Burlington, VT 05401

PH: 802-863-4501 Email: [stormwater@burlingtonvt.gov](mailto:stormwater@burlingtonvt.gov)



**Standard Erosion Prevention & Sediment Control (EPSC) Plan**

This questionnaire and associated EPSC plan sheets are required for projects

- on properties other than single family (R1) or duplexes (R2) that require a level II or III Certificate of Appropriateness or Major Impact zoning applications and involve 5000 sq. ft. or more of earth disturbance; or
- any activity where a zoning permit is not required but where the project involves 10,000 sq. ft. or more of earth disturbance; or
- if requested by the Stormwater Program due to project characteristics such as slope, soils or proximity to drainage structures or waterbodies.

Please note that you must submit EPSC plan and detail sheets as outlined in section A below.

All projects involving redevelopment or addition of impervious surface must submit the stormwater management screening project (attached) for evaluation or meet with the Stormwater Program to determine the stormwater management requirements for your project.

1. Project Location 79 Industrial Parkway

2. Zoning Permit Address (if different from above): \_\_\_\_\_

3. Brief Project Description (i.e. building construction, subdivision, site work)

The project proposes two building additions totaling approximately 14,200 sf of building footprint, paving an existing parking lot, construction of a new parking lot, access drive, stormwater system as well as associated site grading.

4. Owner Name: Zoo Holdings, LLC

5. Owner Mailing Address: 79 Industrial Parkway, Burlington, VT 05401

6. Owner Phone: 802-862-0252

6. Owner email: tcastle@rhinofoods.com

7. Contractor Name: \_\_\_\_\_ ☒ Contractor not known at this time

8. Contractor Phone: \_\_\_\_\_

9. Contractor Email: \_\_\_\_\_

10. Estimated Project Start Date July 2017

Estimated End Date July 2018

11. Area of Land Disturbance 139,022 sq. ft.

12. Total proposed (existing + new) amount of impervious: 112,700 sq. ft.

14. Does your project require a State Construction Stormwater Permit (9020 or INDC) ? ☒ Yes ☐ No  
(You will be required to submit proof of your authorization to discharge prior to initiation of earth disturbance).

**A. REQUIRED PLAN SHEETS:**

15. Plan sheet(s) MUST BE ATTACHED showing the following:

☒ Limits of disturbance

☒ Direction of stormwater flow on site

☒ Location of stockpiles (if any)

☒ Location of sediment control BMP's (silt fence etc.)

☒ Location of stabilized construction entrances

☒ Stabilization measures

☐ Phasing plan (if appropriate)

16. Detail sheet MUST BE ATTACHED and include details for all EPSC measures listed on the EPSC Plan Sheet. Additionally, notes must be included related to:

- ☒ Daily inspection of roadways and sweeping as necessary
- ☐ Dewatering measures (if applicable)
- ☒ Temporary site stabilization requirements
- ☒ Final site stabilization requirements
- ☒ Winter site stabilization (for disturbance after November 1)
- ☒ Inspection requirements

**B. EPSC QUESTIONNAIRE** *(See last page for typical solutions to these questions)*

A) Do you anticipate the need for any dewatering of excavations during the construction? ☐ Yes ☒ No

- If yes, please indicate which plan sheet has details for how dewatering operations will be managed to prevent the discharge of sediment laden water. Sheet(s): \_\_\_\_\_

B) Will excavated soil be stockpiled on the site? ☒ Yes ☐ No If yes, show locations and EPSC measures for the stockpile on plan sheet(s)

- If no, where is the ultimate disposal of excess soil? \_\_\_\_\_

C) Do you plan to park construction vehicles on or disturb City owned property like the greenbelt area? ☐ Yes ☒ No

- If yes, tell us how you agree to repair all disturbances or damage to City owned property and provide a written approval from the City allowing construction vehicles to park on City owned property.

\_\_\_\_\_  
\_\_\_\_\_

- If no, then please monitor all construction and visitor vehicles and advise all not to park on City owned property

D) Will stockpiles or disturbed soils be present and/or exposed after Nov. 1<sup>st</sup> of any construction year? ☒ Yes ☐ No

- If yes, tell us how you plan to stabilize any stockpile and/or disturbed soils.

Disturbed soils will be stabilized with a combination of erosion control matting, mulch, and fast-growing seeds.

Any disturbed soils must have temporary or final stabilization at the end of each work day. This applies to all areas

that will not be self-contained, will not be worked in the next 24 hours, or when rain is expected within 24 hours.

**Do you agree to abide by the following conditions?**

☒ Y ☐ N Applicant will call 863-4501 or email [gjohnson@burlingtonvt.gov](mailto:gjohnson@burlingtonvt.gov) at least 24 hours prior to initiating earth disturbance and submit the **name and contact (cell phone and email) of the erosion control coordinator for the project**

☒ Y ☐ N Applicant will post the attached notice in a visible location

☒ Y ☐ N I acknowledge that it is the responsibility of the owner and his/her representatives to ensure that:

- sediment does not enter surface water bodies (streams, ditches, ponds, lakes, wetlands etc.)
- sediment does not enter City conveyance infrastructure (catch basins, sewers etc.) and
- All sediment must be removed from the city ROW (sidewalks and roadways) by the end of each work day

☒ Y ☐ N Sediment control measures will be installed prior to the initiation of earth disturbance.



- ☒ Y ☐ N During the non-winter construction season (April 15 – November 1): After an initial **14 day** period of initial disturbance, temporary or permanent stabilization (mulching, erosion control matting or tarps for stockpiles or other approved method) of exposed areas and stockpiles will occur at the end of each work day unless:
- Earthwork is to continue in the area within the next 24 hours **and** there is NO liquid precipitation forecast for the next 24 hours; or
  - If work is occurring in a self contained excavation (no outlet) with a depth of 2 feet or greater (e.g. house foundation excavation or utility trenches).
- ☒ Y ☐ N During the winter construction period from November 1 to April 15, any **new disturbance** must be temporary or permanently stabilized (mulching, erosion control matting or tarps for stockpiles, or other approved method) will occur at the end of each work day unless:
- Earthwork is to continue in the area within the next 24 hours **and** there is NO liquid precipitation forecast for the next 24 hours; or
  - If work is occurring in a self-contained excavation (no outlet) with a depth of 2 feet or greater (e.g. house foundation excavation or utility trenches)
- ☒ Y ☐ N The perimeter of the site and all BMPs will be inspected at the **end of each workday** to ensure that sediment will not leave the site. If sediment has travelled beyond the site boundary, it shall be swept up or otherwise removed and deposited on-site in an upgradient area at the **end of each work day**.
- ☒ Y ☐ N The owner and his/her representatives shall abide by the best management practices (BMPs) indicated in this plan and conditions and in the Vermont DEC Low Risk Site Handbook for Erosion Prevention and Sediment Control (2006). Contact 802-863-4501 for a hard copy or go to the web:  
[http://vtwaterquality.org/stormwater/docs/construction/sw\\_low\\_risk\\_site\\_handbook.pdf](http://vtwaterquality.org/stormwater/docs/construction/sw_low_risk_site_handbook.pdf)
- ☒ Y ☐ N If soils will be exposed after November 1st and winter construction has not been permitted the project will **notify DPW prior to October 15<sup>th</sup> and ensure that sediment control is installed PRIOR to soil freezing**. If the project is completed during the winter months, an additional inspection will be required to ensure that the site is buttoned up for the winter.
- ☒ Y ☐ N Within 48 hours of reaching final grading, the exposed soil will be seeded and mulched or covered with erosion control matting (for slopes steeper than 3:1 or high wind prone areas). Erosion control matting is preferred.
- ☒ Y ☐ N The owner will contact DPW to schedule a stabilization inspection when site work is finished and stabilization measures (seeding and mulching or matting) have been installed.

#### AGREEMENT

By filling out and signing this plan, I agree to abide by the terms and conditions outlined above. Failure to follow this plan can result in a stop work order by the City of Burlington, fines, or both.

By: ☒ Owner ☐ Contractor

Edward Castle  
Name

Signature

Date

5/8/17

Additional Conditions of Approval:

# AN EROSION PREVENTION AND SEDIMENT CONTROL PLAN

FOR THE PROJECT AT:

79 Industrial Parkway

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HAS BEEN FILED WITH THE CITY OF BURLINGTON  
STORMWATER MANAGEMENT PROGRAM IN ACCORDANCE  
WITH CHAPTER 26 OF THE BURLINGTON CODE OF ORDINANCES

THIS REQUIRES THAT MEASURES BE INSTALLED OR TAKEN TO  
PREVENT SEDIMENT FROM LEAVING THE SITE AND ENTERING  
WATERWAYS AND IMPACTING CITY INFRASTRUCTURE  
(RIGHT OF WAY AND STORMDRAINS)

FOR QUESTIONS OR TO REPORT SEDIMENT LEAVING THE SITE  
CALL 802-863-4501

This notice to be posted in full view at all times during earth  
disturbance. Additional conditions on attached.

Plan Approved by: \_\_\_\_\_  
Burlington Stormwater Program

Date: \_\_\_\_\_



## TYPICAL SOLUTIONS TO PREVENT OR CONTROL SEDIMENT AND EROSION

### STOCKPILES

- Cover small stockpiles with a tarp when not being used.
- Install silt fencing or other appropriate devices around the stockpiles to filter sediment.
- Cover stockpiles with straw or other approved mulching material.
- Plan to remove any unusable material as soon as possible from the site to an approved location.
- Plant grass and mulch stockpiles that will be on site for more than 14 days.
- Cover, vegetate or install erosion matting on stockpiles that will remain disturbed over the winter.

### DISTURBED AREAS

- Maintain vegetated buffers around disturbed areas.
- Install silt fencing or other appropriate device to filter sediment washing off from disturbed areas. Remember that the bottom of the silt fence must be “keyed in” (dug into ground) to work correctly.
- To prevent sediment from running off your site via your driveway (or other paved areas where you can’t install silt fence) use a row of hay bales or tube sand.
- Cover disturbed areas as soon as possible with straw or other approved mulching material. Use erosion control matting in high wind, traffic or slopes steeper than 3:1 (horizontal to vertical), and follow the manufacturer’s guidelines staple the matting down.
- Plant grass and mulch or use erosion control matting all disturbed areas that will remain exposed for more than 14 days.
- Cover, vegetate or install erosion matting on areas that will remain disturbed over the winter.
- Protect ditches, catch basins or water bodies off-site by using silt fencing, gravel check dams or other approved sediment control methods.

### CONSTRUCTION VEHICLES

- Do not park construction vehicles on City owned green space. Vehicles disturb vegetation and compact the soil, thereby reducing its ability to infiltrate stormwater. Any green belt disturbance will need to be permanently stabilized with grass seed and erosion control matting.
- Prevent sediment from leaving the project by cleaning the tires of vehicles, or use clean gravel at project access points to clean tires.
- Sweep city streets, sidewalks and bikepaths daily or as needed to remove sediment transported from the project.

### RESOURCES

The Vermont Handbook for Erosion Prevention and Sediment Control at:  
[http://vtwaterquality.org/stormwater/docs/construction/sw\\_low\\_risk\\_site\\_handbook.pdf](http://vtwaterquality.org/stormwater/docs/construction/sw_low_risk_site_handbook.pdf)

The City of Burlington Stormwater Program Page at  
<http://www.burlingtonvt.gov/DPW/Stormwater-Management>



## Stormwater Management Plan Pre-Screening

Please provide the following information to the Stormwater Program ([stormwater@burlingtonvt.gov](mailto:stormwater@burlingtonvt.gov), ph: 863-4501) in order to determine what the requirements will be for your project.

- General Information
  - Project Address: 79 Industrial Parkway
  - Owner: Zoo Holdings LLC, DBA Rhino Foods, Inc.
  - Engineer: Alicia Feiler, DeWolfe Engineering Associates, P.C.
  - Brief project description: The project proposed two new building additions totaling approximately 14,200 sf of building footprint, paving of an existing parking lot, construction of a new parking lot, access drive, and stormwater system, as well as associated site grading.
- Stormwater Management Plan
  - Impervious<sup>1</sup> change summary

| Condition           | Type                      | Total Impervious (s.f.) |
|---------------------|---------------------------|-------------------------|
| Existing Conditions | Existing Impervious       | 83,895 sf               |
| Proposed            | Total Proposed (1+2+3)    | 112,700 sf              |
|                     | 1) New <sup>2</sup>       | 43,180 sf               |
|                     | 2) Existing to Remain     | 28,687 sf               |
|                     | 3) Redeveloped            | 40,833 sf               |
| Net New             | Total Proposed – Existing | 28,805 sf               |

*If available at this time:*

- Existing conditions: *description of existing conditions, description of existing stormwater system, existing drainage issues, current connectivity to City system*  
 There is no existing stormwater management system on site, currently all runoff flows via sheetflow to the roadside ditch which is part of the municipal stormwater system.
- Proposed Conditions: *description of proposed conditions, brief description of proposed stormwater system, proposed method of discharge to receiving water or City system (overland flow, direct connection via pipe, existing or new manhole or CB)*  
 Stormwater runoff from portions of rooftops, portions of drives and parking, via sheetflow to treatment channel and portions of rooftops and pavement conveyed via drainage piping, all collected in a wet pond with pre-treatment forebay discharging by controlled outlet structure and stabilized via municipal stormwater system to Lake Champlain.

<sup>1</sup> Impervious = any surface off of which water runs off rather than infiltrates, including, but not limited to rooftops and paved/unpaved (gravel/packed dirt) driveways, walkways and patios

<sup>2</sup> Impervious where there is not currently impervious

RECEIVED  
MAY 09 2017

DEPARTMENT OF  
PLANNING & ZONING

# Erosion Prevention and Sediment Control Plan

*Rhino Foods, Inc.*

*79 Industrial Parkway  
Burlington, Vermont*

*May 8, 2017*

## Table of Contents:

1. Project Description
2. Parcel Description
3. Critical Areas
4. Soil Stockpiling
5. Dust Control
6. General Erosion Control
7. Construction Restrictions
8. Erosion and Sediment Control Measures



1. **Project Description**

The Rhino Foods Addition project consists of the construction of 14,200 sf building footprint additions to the existing 29,900 sf food processing facility on Industrial Parkway. The project includes shipping, receiving, and trash docks, an access drive around the facility, and parking lots to accommodate 86 cars. The project proposes to create 0.99 acres of new impervious cover and disturb a total of 3.19 acres. The total impervious cover for the parcel will be 2.59 acres.

2. **Parcel Description**

The project parcel is located on Industrial Parkway in Burlington, Vermont and has an area of 5.01 acres. The parcel is square in shape. The site slopes from southwest to northeast at an average grade of 2%. The parcel is bounded on the eastern side by Industrial Parkway, the southern side by an open field which slopes towards the project parcel, the western side by residential lots, and to the north by a parcel owned by Chittenden County Transportation Authority. The entire site and adjacent areas drain to the roadside ditch along the western side of Industrial Parkway.

The existing development is in the central area of the parcel and to the north and east. There are mature trees along the western property line and undeveloped mowed lawn with a minor number of plantings along the southern property line.

3. **Critical Areas**

**Soils:** The project proposes to disturb 3.19 acres, the site area. The site area consists of three types of soil, 0.15 acres Munson and Raynham silt loams, 1.96 acres Covington silty clay, and 1.08 acres of Enosburg and Whately. The soils' susceptibility to erosion varies.

**Slope:** The site area is relatively level which will require a minor cut slope along the western and southern limits of disturbance. The slopes are limited to a slope of 1v:3h and will be stabilized with established turf.

**Water Resources:** There is a small class III wetland associated with the roadside ditch along the eastern side of the property. The wetland drains through the driveway culvert and flows to the north in the roadside ditch. The wetland is considered not of size or value that the State of Vermont does not regulate it. The Army Corps of Engineers do require documentation of the disturbance to the wetland, but the proposed disturbance is within the allowable amount the Corps dictates.

4. **Soil Stockpiling**

Soil stockpiles shall be located on-site by the contractor. No soil stockpiles shall be placed within 50 feet of areas of concentrated stormwater flows.

All soil stockpiles shall be surrounded with silt fence and covered with mulch and matting. Stormwater run-on shall be avoided by using sandbags or other diversion methods. When a storm event is predicted, the stockpile shall be protected with an anchored protective cover. If a stockpile is to remain inactive for a period of more than 30 days the stockpile shall be temporarily seeded with a rapid growing cover crop.

5. **Dust Control**

Any surfaces with exposed soils shall be subjected to dust control measures. To reduce the need for dust control the contractor shall maintain as much natural cover as possible, use traffic control to restrict traffic to predetermined routes, use temporary/permanent mulching and vegetation or sodding, and/or fine water spray around stationary sources of dust.

To control dust the contractor shall moisten the surfaces periodically with adequate water to control dust while being careful to avoid excessive application of water that would mobilize sediment via runoff. The surface may also be covered with crushed stone or coarse gravel; in areas adjacent to waterways only chemically stable or washed aggregate may be used.

6. **General Erosion Control**

Sheets C0.02, C1.05, and C5.01 contain the general erosion control notes and locations of specific erosion and sediment control measures. C0.02 contains the general erosion control notes. C1.05 is the erosion control plan. Sheet C5.01 shows details of the erosion and sediment control measures used in this plan.

7. **Construction Restrictions**

Listed below are several restrictions to the construction activities and shall be followed in conjunction with any other notes or details listed in the construction plan set and permits associated with the project. If more than one restriction is listed, the most restrictive must be followed.

- Sediment control measures shall be installed prior to the initiation of earth disturbance and added as construction progresses.
- This project must not have disturbed earth in any one location for more than 7 consecutive calendar days without temporary or final stabilization has been implemented.
- This project must limit earth disturbance on the site to two acres or less at any one time.
- Vehicles associated with construction activities shall not be parked along the public right-of-way or in publicly owned green space.
- The perimeter of the site and all erosion prevention and sediment control measures shall be inspected at the end of each workday to prevent sediment from leaving the site. If any is found, it must be cleaned immediately.

## 8. Erosion and Sediment Control Measures

### **Temporary & Permanent Mulching:**

Temporary and permanent mulching protects the exposed soils from erosion by preventing direct impact from rainfall. Mulching also aids the growth of vegetation and can be used as permanent ground cover. Mulching shall not be used in areas of concentrated flows. Within 100 feet of streams, wetlands, and in lake watersheds, temporary mulching shall be applied within 7 days of exposing soil or prior to any storm event. Any areas that are to be seeded shall be mulched immediately following the seeding.

All temporary mulches must be inspected periodically and in particular after rainstorms, to check for rill erosion or displacement of the mulch. The mulch shall cover at least 90% of the soil surface at all times, if less, more mulch shall be applied. Nets must be inspected after rainfall events to check for breakages and repairs must be made as necessary. Permanent mulches shall be inspected at least annually and after each rainfall which produces at least 2.5 inches in a 24 hour period, repairs are to be made immediately.

### **Temporary Erosion Control Blanket:**

Temporary erosion control blankets or mats generally consist of machine-made mats of organic, biodegradable mulch such as straw, curled wood fiber (excelsior), coconut fiber, or combination thereof. Erosion control blankets are installed on prepared soil surfaces to provide erosion protection and slope stability on steep slopes, vegetated channels, or shorelines during vegetation establishment. All blankets and mats shall be inspected weekly during construction and after any rainfall event which produces at least ½ inch of rain in a 24-hour period.

### **Silt Fence:**

Silt fences are temporary sediment barriers constructed from filter fabric attached to posts and entrenched into the soil. Silt fences are to be a maximum of 36 inches high and installed across or at the toe of slopes to allow ponding of runoff from construction sites and allow any soil particles to settle out. Fences are to be inspected immediately after any rainfall event and daily during prolonged rainfall events. Sediment build up shall not exceed ½ the height of the silt fence and shall be removed to an appropriate location. If there are any signs of failure such as erosion or sediment downstream, or decomposition of the fence, the fence shall be repaired immediately. Silt fences must be used in harmony with check dams and other erosion control measures.

### **Temporary Check Dams:**

Temporary check dams are stone dams constructed across a swale or drainage ditch and are used to reduce the velocity of stormwater flows thus reducing erosion. The check dams are to be inspected immediately after any



rainfall event and daily during prolonged rainfall events, any repairs are to be made immediately. Inspections should verify that the center of the dam is lower than its edges. Any erosion around the dam is to be corrected immediately. Temporary check dams may also catch sediment but are not to be used as such; any sediment trapped shall be removed when it reaches  $\frac{1}{2}$  the height of the check dam or sooner.

**Temporary Construction Entrance:**

A temporary construction entrance is a stabilized pad of stone aggregate on a geotextile filter fabric, located at any point where traffic will be leaving a construction site and entering an existing access road or other paved surface. The purpose of the construction entrance is to reduce or eliminate the tracking of sediment onto public roads by construction vehicles, thus reducing sedimentation into receiving waters. When the pad becomes ineffective the stone and collected material shall be removed stabilized on site, then the pad reconstructed. If soil materials are tracked onto the adjacent pavement, the contractor shall sweep the pavement clear of the sediment.

**Temporary & Permanent Vegetation:**

Temporary and permanent vegetative cover is used to stabilize disturbed areas thus reducing damage from sediment and runoff. Temporarily seeded areas shall be inspected weekly and after any rainfall which produces  $\frac{1}{2}$  inch of rain in 24 hours. Permanent seeded areas shall be inspected monthly during construction and mowed as required to maintain a healthy stand of vegetation. At a minimum, 85% of the soil surface shall be covered by vegetation. If erosion or sedimentation is apparent, the areas are to be repaired and re-seeded and measures shall be taken to ensure prevent future erosion.



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DEPARTMENT OF  
PLANNING & ZONING

# Operational Stormwater Treatment and Maintenance Plan

*Rhino Foods Expansion*

*79 Industrial Parkway  
Burlington, VT*

*May 8, 2017*

*Prepared by:*

Alicia Feiler, PE  
DeWolfe Engineering Associates, PC.  
317 River Street  
P.O. Box 1576  
Montpelier, Vermont 05601-1576



## **Introduction**

Alicia Feiler, PE of DeWolfe Engineering Associates, PC is writing on behalf of Rhino Foods, Inc. to apply for an amendment to Individual Stormwater Permit 4259-INDS for the above referenced project.

## **Project Description**

The Rhino Foods Expansion project located at 79 Industrial Parkway in Burlington, Vermont consists of the construction of two building additions totaling approximately 14,200 sf of building, paving of an existing car parking lot, construction of new parking lot, access drive, and stormwater system, as well as associated site grading. The project requires coverage under a Stormwater Discharge Permit as the post 2002 impervious surface areas are greater than 5,000 sf and thus meet the regulatory threshold. The project requires coverage under the Individual Discharge Permit (INDS) due to site-balancing being utilized.

A similar project was permitted as 4259-INDS in 2016. The owner has not constructed the previously proposed project and this project will replace the previously proposed impervious expansions and stormwater treatment systems.

## **Existing Conditions**

The project parcel is a 5.01 acre lot which is currently occupied by Rhino Foods, Inc. which is a food processing facility. Existing on site is a 29,900 sf building with associated gravel drives and parking. The cover of the land is mostly concrete, gravel, building, or established turf. There is a small wooded area along the western property line. Currently the site has no stormwater management practices and water flows via sheet flow from all surfaces to an existing roadside ditch along Industrial Parkway owned by the City of Burlington. The roadside slope is part of Burlington's municipal stormwater system which discharges into Lake Champlain. The overall slope across the site is roughly 2%.

| Area<br>(acres) | Soil Name                             | Cover Description                          | HYG   |
|-----------------|---------------------------------------|--------------------------------------------|-------|
| 2.11            | Enosburg and<br>Whately               | Existing Building,<br>Gravel Drive, Wooded | C/D   |
| 2.54            | Covington Silty Clay                  | Building, Gravel<br>Drive, Mowed Grass     | D     |
| 0.05            | Belgrade and<br>Eldridge Soils        | Mowed Grass                                | B/C/D |
| 0.16            | Munson and<br>Raynham Silt Loams      | Mowed Grass                                | C/D   |
| 0.15            | Farmington<br>Extremely Rocky<br>Loam | Wooded                                     | D     |

### **Existing Stormwater System**

There is no existing stormwater management system on site, currently all runoff flows via sheet flow to the roadside ditch which is part of the municipal stormwater system.

#### **SN001 – Roadside Ditch**

### **Post-development Conditions**

S/N001: Stormwater runoff from portions of rooftops, portions of drives and parking, via sheetflow to grass treatment channel and portions of rooftops and pavement conveyed via drainage piping, all routed to wet pond with pre-treatment forebay discharging by controlled outlet structure and stabilized outfall via municipal stormwater system to Lake Champlain.

#### **SN001 – Roadside Ditch**

### **Proposed Stormwater System**

DeWolfe Engineering Associates, PC has designed the site improvements to meet or exceed the stormwater treatment standards and practices of the State of Vermont Stormwater Management Manual. All stormwater runoff calculations are based on the discharge point from each of the above described areas.

- a. **Amount of Impervious Area:** The project site area is 3.19 acres. The project creates 1.04 acres of new impervious area, including 0.05 acres of future new impervious surfaces, and redevelops under one acre of existing impervious area. The treatment practices accommodate 0.92 acres of new, 0.32 acres of existing, and 0.24 acres of redeveloped impervious surfaces. The total areas covered under the INDS will be 0.87 acres new and 0.17 acres existing impervious surfaces. The future expansion area has been included in all modeling and application materials in order to accommodate potential field changes as part of the construction process.
- b. **Receiving Water:** The receiving water for the project is the Lake Champlain.
- c. **Fish Habitat Designation:** The area of discharge to Lake Champlain is a warm water fish habitat.
- d. **VSWMM Compliance Standards:**

The Grass-lined Treatment Channel design criteria is as follows:

Bottom Width : 3.00 ft  
Channel Depth: 1.25 ft  
Side Slopes: 3H:1V  
Longitudinal Slope: 0.62%  
WQv residence time: 30.1 minutes  
1 year storm velocity: 0.55 fps  
Depth of water during the 10 year rain event: 0.70 ft

The wet pond design criteria is as follows:

Water Quality Volume: 2,186 cf

Forebay Volume: 1,839 cf (> 10% of WQv)  
Permanent Pool Depth:  
    1.37 ft (Main Cell)  
    4.00 ft (Forebay)  
Permanent Pool Volume: 6,663 cf  
Length to Width Ratio: 5:1  
Side Slope: 3:1  
Drainage Area: 3.19 acres

1. **Water Quality (0.9")** –The Water Quality Treatment Standard is met through the use of a grass treatment channel. The treatment channel is located to collect runoff from a portion of parking lot, access drive, and roof top by overland sheet flow. The grass treatment channel has a residence time of 30.1 minutes. The peak depth during the water quality storm is 0.33 feet.
2. **Groundwater Recharge** – The Groundwater Recharge Treatment Standard is met through the use of the grass treatment channel. The recharge standard requires that 0.037 acres be directed to an infiltration practice. The channel collects 0.67 acres of impervious areas from within the site area.
3. **Channel Protection (1 year)** – The Channel Protection Treatment Standard is met through the use of a 1.5" orifice in the outlet control structure of the wet pond. The center-of-mass detention time is 1,594 minutes, which exceeds the required 1,440 minute detention time.
4. **Overbank (10 Year) Flood Protection** - The Overbank Flood Protection Treatment Standard is met through the use of the wet pond. The outlet of the wet pond is directed to the roadside ditch along Industrial Parkway. The pre-development peak discharge rate is 15.30 cfs. The post-development peak discharge rate discharge rate is 10.88 cfs.
5. **Extreme (100 Year) Flood Protection** - The Extreme Flood Protection Treatment Standard is waived the impervious area is less than ten (10) acres.

### **Stormwater Treatment System Maintenance**

#### **General Stormwater Maintenance**

- Sweep accumulated winter sand from parking area after snow melt. Do not sweep sand into swale, ditches, or to other stormwater conveyance or treatment systems.
- Inspect stormwater treatment systems semi-annually, in the spring after snow melt and in the fall prior to snow fall.

#### **Catchbasins**

- Catchbasin sumps shall be checked semi-annually for the depth of sediment and cleaned when the depth of sediment exceeds ½ of the total sump depth.
- Dispose of sediment in a suitable stabilized upland location.
- After each rainfall which produces runoff remove debris from inlet grates.

#### **Grass Lined Treatment Channel**

- Channel shall be cleaned of debris and accumulated sand in the spring after snow melt.



- The vegetation within the channel shall be mowed regularly to maintain grass heights of 4 to 6 inches.

**Wet Pond**

- Slopes of the pond, above the permanent pool shall be mowed regularly to prevent the growth of woody brush and trees.
- The outlet control structure shall be inspected after each rain fall event creating runoff, and any debris removed from within the structure and check that orifices are not clogged.
- The stormwater hood in the outlet control structure shall be checked to confirm it is securely fastened to the structure.
- Annually and after major storms the pond slopes shall be inspected for erosion and any areas of damage shall be repaired.
- Annually and after major storms the channel below the primary outlet shall be inspected for erosion and damage shall be repaired. If erosion occurs in the same area consistently, larger stone fill shall be used to stabilize the area.

**Forebay**

- The depth of sediment on the forebay shall be checked annually. Sediment shall be removed from the forebay every 5 to 6 years or after 50% of total forebay volume has been lost.

**Outfalls**

- Inspect outfalls annually for signs of erosion. Any erosion shall be corrected by expansion of the stabilization practice used to protect the outfall.



## Grass-Lined Treatment Channel Operation, Maintenance, and Management Inspection Checklist

Project:  
Location:  
Site Status:  
Date:  
Time:  
Inspector:

| Maintenance Item                                                 | Satisfactory / Unsatisfactory | Comments |
|------------------------------------------------------------------|-------------------------------|----------|
| <b>1. Debris Cleanout (Monthly)</b>                              |                               |          |
| Contributing areas clean of debris                               |                               |          |
| <b>2. Vegetation (Semi-Annually)</b>                             |                               |          |
| Mowing done when needed                                          |                               |          |
| Minimum mowing depth not exceeded (4" minimum)                   |                               |          |
| No evidence of erosion                                           |                               |          |
| <b>3. Dewatering (Monthly)</b>                                   |                               |          |
| Channel dewaterers between storms                                |                               |          |
| <b>4. Sediment deposition (Annual)</b>                           |                               |          |
| Remove deposited sediment                                        |                               |          |
| <b>5. Outlet/ Overflow Spillway (Annual, After major Storms)</b> |                               |          |
| Good condition, no need for repairs                              |                               |          |
| No evidence of erosion                                           |                               |          |

Comments:

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Repairs/Maintenance Completed:

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## Wet Pond Operation, Maintenance, and Management Inspection Checklist

Project:  
 Location:  
 Site Status:  
 Date:  
 Time:  
 Inspector:

| Maintenance Item                                    | Satisfactory / Unsatisfactory | Comments |
|-----------------------------------------------------|-------------------------------|----------|
| <b>1. Embankment (Annual, After Major Storms)</b>   |                               |          |
| Vegetation and ground cover adequate                |                               |          |
| No embankment erosion                               |                               |          |
| No animal burrows                                   |                               |          |
| No unauthorized planting                            |                               |          |
| Pond drain clear and functioning                    |                               |          |
| No seep/leaks on downstream face                    |                               |          |
| Slope protection stable or no riprap failure        |                               |          |
| Emergency spillway clear of obstructions and debris |                               |          |
| <b>2. Riser and Principal Spillway (Annual)</b>     |                               |          |
| Low flow orifice unobstructed                       |                               |          |
| Low flow trash rack                                 |                               |          |
| a. Free of debris                                   |                               |          |
| b. No corrosion present                             |                               |          |
| Weir trash rack maintenance                         |                               |          |
| a. Debris removal necessary                         |                               |          |
| b. Corrosion control                                |                               |          |
| Excessive sediment accumulation in riser            |                               |          |
| Concrete/masonry condition riser and barrels        |                               |          |
| a. Cracks or displacement                           |                               |          |
| b. Minor spalling (<1")                             |                               |          |
| c. Major spalling (rebar exposed)                   |                               |          |

|                                                              |  |  |
|--------------------------------------------------------------|--|--|
| d. Joint failures                                            |  |  |
| e. Water tightness                                           |  |  |
| Pond drain valve                                             |  |  |
| a. Operational/exercised                                     |  |  |
| Outfall channels functioning                                 |  |  |
| Other (Specify)                                              |  |  |
| <b>3. Permanent Pool (Monthly)</b>                           |  |  |
| Undesirable vegetative growth                                |  |  |
| Floating or floatable debris removal required                |  |  |
| Visible pollution                                            |  |  |
| Shoreline problem                                            |  |  |
| Other (Specify)                                              |  |  |
| <b>4. Sediment Forebays (Annual)</b>                         |  |  |
| Sedimentation noted                                          |  |  |
| Sediment cleanout when depth < 50% design depth              |  |  |
| <b>5. Dry Pond Areas (Annual)</b>                            |  |  |
| Vegetation adequate                                          |  |  |
| Undesirable vegetative growth                                |  |  |
| Undesirable woody vegetation                                 |  |  |
| Low flow channels clear of obstructions                      |  |  |
| Standing water or wet spots                                  |  |  |
| Sediment and / or trash accumulation                         |  |  |
| Other (Specify)                                              |  |  |
| <b>6. Condition of Outfalls (Annual, After Major Storms)</b> |  |  |
| Riprap failures                                              |  |  |
| Slope erosion                                                |  |  |
| Storm drain pipes                                            |  |  |
| Other (Specify)                                              |  |  |
| <b>7. Vegetation (Annual)</b>                                |  |  |
| Vegetation healthy and growing                               |  |  |
| Evidence of invasive species                                 |  |  |

Comments:

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Repairs/Maintenance Completed:

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## Catch Basin Operation, Maintenance, and Management Inspection Checklist

Project:  
Location:  
Site Status:  
Date:  
Time:  
Inspector:

| Maintenance Item                                        | Satisfactory /<br>Unsatisfactory | Comments |
|---------------------------------------------------------|----------------------------------|----------|
| <b>1. Debris Cleanout (Monthly, After Major Storms)</b> |                                  |          |
| Contributing areas clean of debris                      |                                  |          |
| <b>2. Sediment deposition (Semi-Annual)</b>             |                                  |          |
| Depth of sediment less than 50% of the sump depth       |                                  |          |

Comments:

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Repairs/Maintenance Completed:

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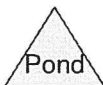
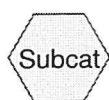
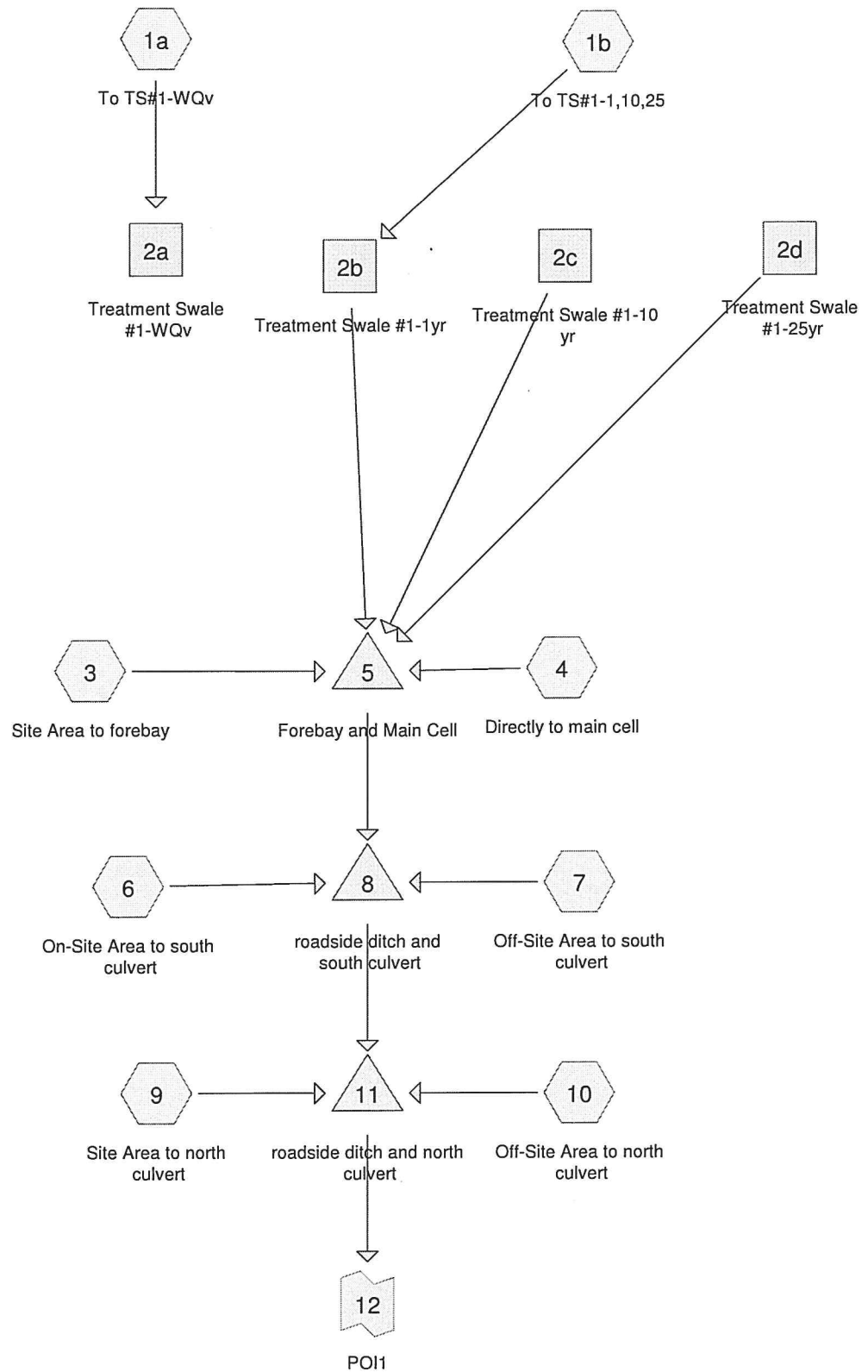
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# WQv Storm

Post Development



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Rhino Foot  
Type II 24-hr WQv Rainfall=0.90

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Page 1

**Summary for Subcatchment 1a: To TS#1-WQv**

Runoff = 0.72 cfs @ 12.26 hrs, Volume= 0.072 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr WQv Rainfall=0.90"

|   | Area (sf) | CN | Description                            |
|---|-----------|----|----------------------------------------|
| * | 2,200     | 93 | EXTRA IMPERVIOUS                       |
| * | 27,016    | 93 | Pavement and Roof                      |
| * | 13,842    | 93 | >75% Grass cover, Good, HSG D          |
| * | 7,883     | 93 | >75% Grass cover, Good, HSG C          |
| * | 7,883     | 93 | >75% Grass cover, Good, HSG D          |
| * | 5,380     | 93 | Off-site Roof                          |
| * | 4,407     | 93 | off-site roof                          |
| * | 23,203    | 93 | off-site Woods, Good, HSG D            |
| * | 7,452     | 93 | off-site Woods, Good, HSG C            |
| * | 887       | 93 | off-site >75% Grass cover, Good, HSG D |
| * | 888       | 93 | off-site >75% Grass cover, Good, HSG C |
|   | 101,041   | 93 | Weighted Average                       |
|   | 101,041   |    | 100.00% Pervious Area                  |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                            |
|-------------|------------------|------------------|----------------------|-------------------|------------------------------------------------------------------------|
| 23.2        | 100              | 0.1000           | 0.07                 |                   | <b>Sheet Flow,</b><br>Woods: Dense underbrush n= 0.800 P2= 2.30"       |
| 4.4         | 120              | 0.0333           | 0.46                 |                   | <b>Shallow Concentrated Flow,</b><br>Forest w/Heavy Litter Kv= 2.5 fps |
| 3.3         | 300              | 0.0100           | 1.50                 |                   | <b>Shallow Concentrated Flow,</b><br>Grassed Waterway Kv= 15.0 fps     |
| 30.9        | 520              | Total            |                      |                   |                                                                        |

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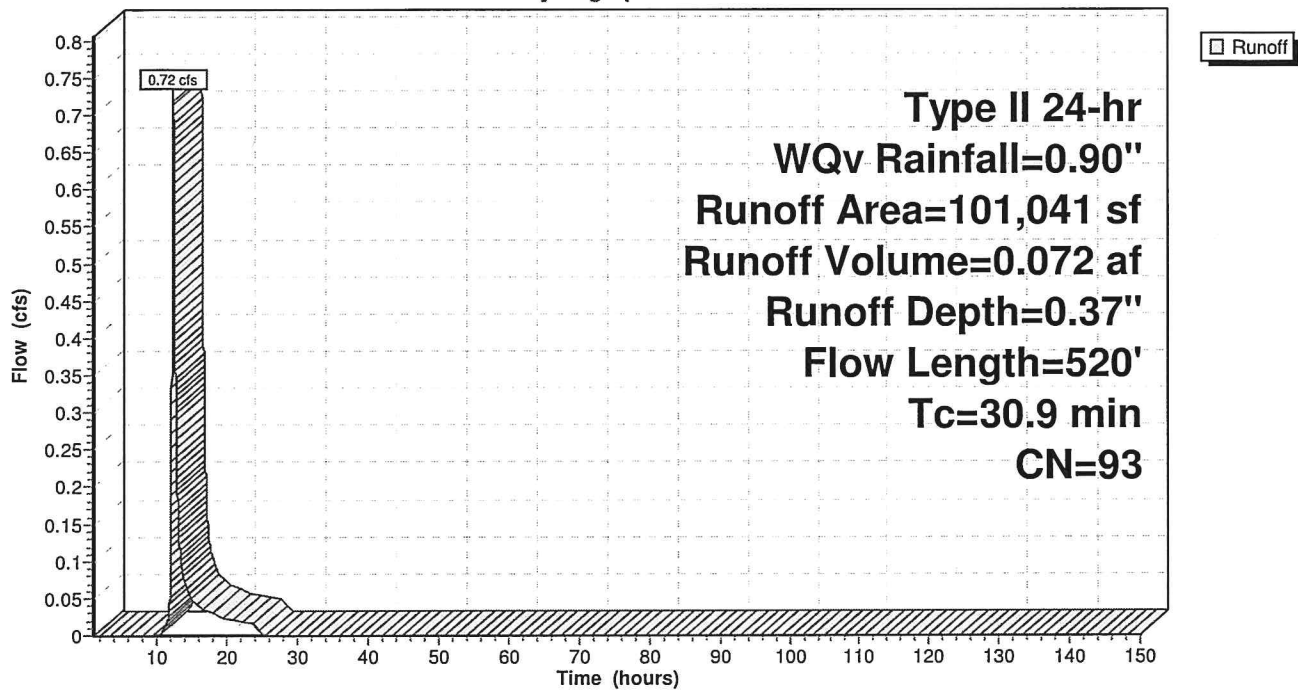
Rhino Foods  
Type II 24-hr WQv Rainfall=0.90"

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Page 2

**Subcatchment 1a: To TS#1-WQv**

Hydrograph



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Rhino Food  
Type II 24-hr WQv Rainfall=0.90"

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Page 1

**Summary for Subcatchment 3: Site Area to forebay**

Runoff = 0.70 cfs @ 11.96 hrs, Volume= 0.034 af, Depth= 0.60"

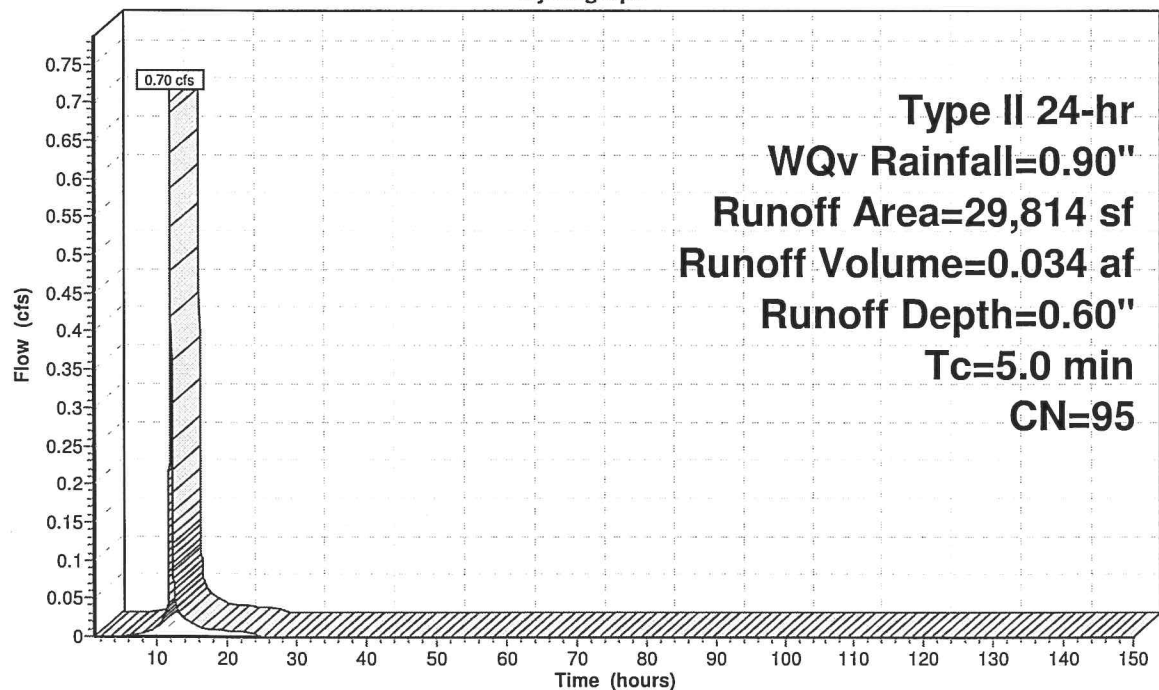
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr WQv Rainfall=0.90"

|   | Area (sf) | CN | Description                   |
|---|-----------|----|-------------------------------|
| * | 25,509    | 98 | Paved parking and roof        |
|   | 4,305     | 80 | >75% Grass cover, Good, HSG D |
|   | 29,814    | 95 | Weighted Average              |
|   | 4,305     |    | 14.44% Pervious Area          |
|   | 25,509    |    | 85.56% Impervious Area        |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description   |
|-------------|------------------|------------------|----------------------|-------------------|---------------|
| 5.0         |                  |                  |                      |                   | Direct Entry, |

**Subcatchment 3: Site Area to forebay**

Hydrograph



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Rhino Foods  
Type II 24-hr WQv Rainfall=0.90"

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Page 4

### Summary for Subcatchment 4: Directly to main cell

Runoff = 0.14 cfs @ 11.91 hrs, Volume= 0.006 af, Depth= 0.27"

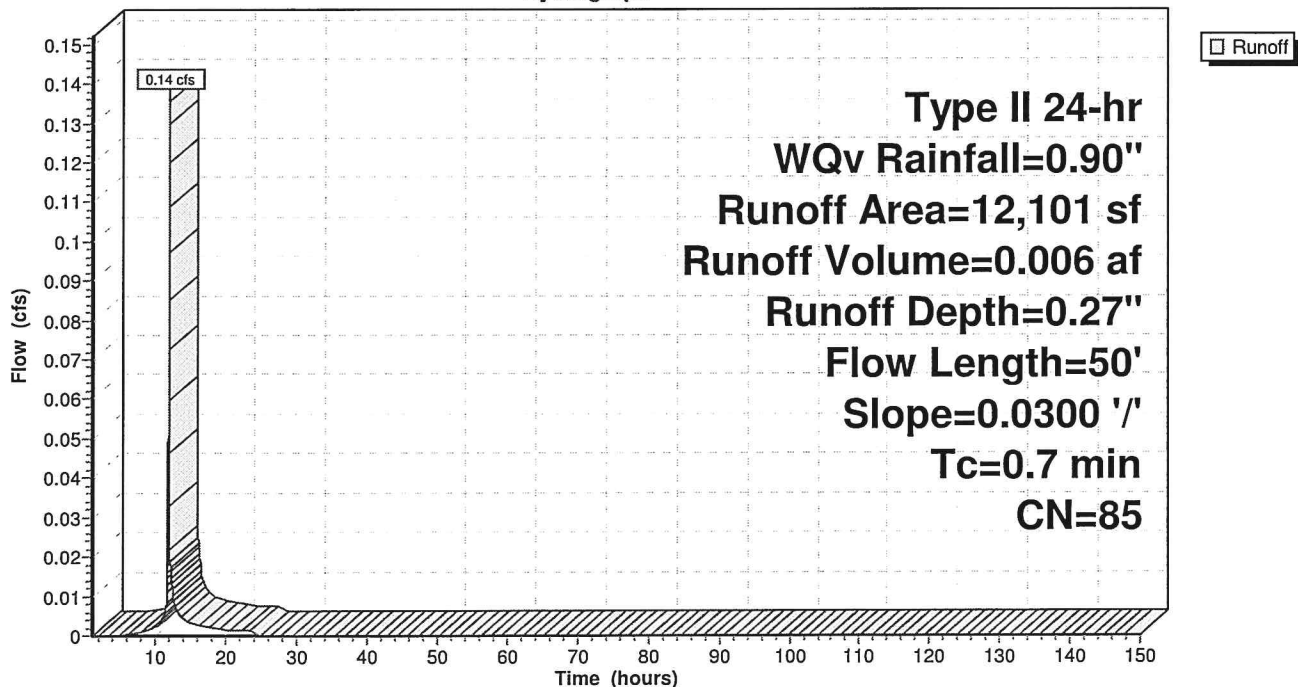
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr WQv Rainfall=0.90"

| Area (sf) | CN | Description                   |
|-----------|----|-------------------------------|
| * 4,267   | 98 | Paved and Roof                |
| 3,742     | 80 | >75% Grass cover, Good, HSG D |
| 2,046     | 80 | >75% Grass cover, Good, HSG D |
| 2,046     | 74 | >75% Grass cover, Good, HSG C |
| 12,101    | 85 | Weighted Average              |
| 7,834     |    | 64.74% Pervious Area          |
| 4,267     |    | 35.26% Impervious Area        |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                       |
|----------|---------------|---------------|-------------------|----------------|---------------------------------------------------|
| 0.7      | 50            | 0.0300        | 1.19              |                | Sheet Flow,<br>Smooth surfaces n= 0.011 P2= 2.30" |

### Subcatchment 4: Directly to main cell

Hydrograph



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Rhino Food  
Type II 24-hr WQv Rainfall=0.90

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Page 1

**Summary for Subcatchment 6: On-Site Area to south culvert**

Runoff = 0.03 cfs @ 12.50 hrs, Volume= 0.004 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr WQv Rainfall=0.90"

| Area (sf) | CN | Description                   |
|-----------|----|-------------------------------|
| 2,040     | 74 | >75% Grass cover, Good, HSG C |
| 2,040     | 80 | >75% Grass cover, Good, HSG D |
| 1,250     | 80 | >75% Grass cover, Good, HSG D |
| 2,801     | 98 | Paved parking, HSG D          |
| 8,131     | 85 | Weighted Average              |
| 5,330     |    | 65.55% Pervious Area          |
| 2,801     |    | 34.45% Impervious Area        |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                            |
|----------|---------------|---------------|-------------------|----------------|------------------------------------------------------------------------|
| 37.6     | 150           | 0.0670        | 0.07              |                | <b>Sheet Flow,</b><br>Woods: Dense underbrush n= 0.800 P2= 2.30"       |
| 3.9      | 140           | 0.0570        | 0.60              |                | <b>Shallow Concentrated Flow,</b><br>Forest w/Heavy Litter Kv= 2.5 fps |
| 10.1     | 630           | 0.0220        | 1.04              |                | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps   |
| 0.7      | 101           | 0.0200        | 2.28              |                | <b>Shallow Concentrated Flow,</b><br>Unpaved Kv= 16.1 fps              |
| 52.3     | 1,021         | Total         |                   |                |                                                                        |



**Post-Development-02.22.2017**

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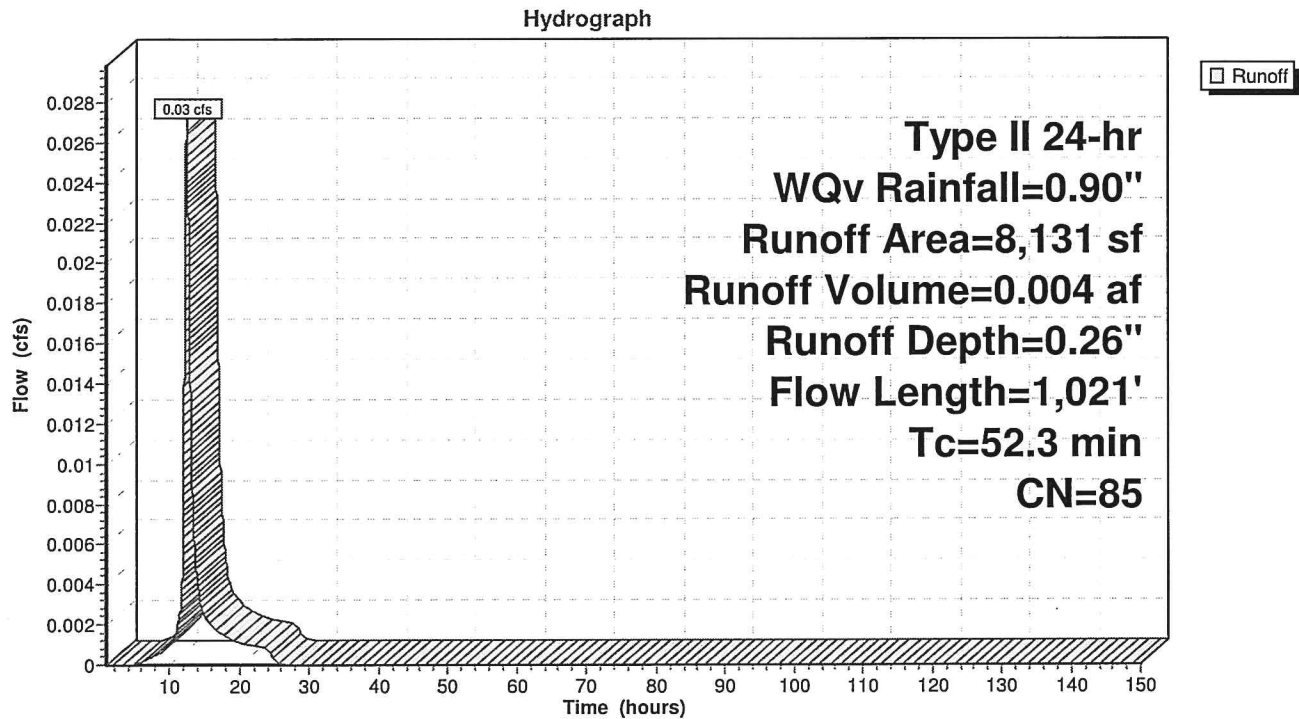
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Rhino Foods  
Type II 24-hr WQv Rainfall=0.90"

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Page 6

**Subcatchment 6: On-Site Area to south culvert**



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Rhino Food  
Type II 24-hr WQv Rainfall=0.90

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Page

**Summary for Subcatchment 7: Off-Site Area to south culvert**

Runoff = 0.63 cfs @ 12.50 hrs, Volume= 0.119 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr WQv Rainfall=0.90"

| Area (sf) | CN | Description                   |
|-----------|----|-------------------------------|
| 143,594   | 77 | Woods, Good, HSG D            |
| 0         | 70 | Woods, Good, HSG C            |
| 103,187   | 74 | >75% Grass cover, Good, HSG C |
| 103,187   | 80 | >75% Grass cover, Good, HSG D |
| 125,044   | 80 | >75% Grass cover, Good, HSG D |
| * 63,788  | 98 | Paved or roof                 |
| 538,800   | 80 | Weighted Average              |
| 475,012   |    | 88.16% Pervious Area          |
| 63,788    |    | 11.84% Impervious Area        |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                            |
|----------|---------------|---------------|-------------------|----------------|------------------------------------------------------------------------|
| 37.6     | 150           | 0.0670        | 0.07              |                | <b>Sheet Flow,</b><br>Woods: Dense underbrush n= 0.800 P2= 2.30"       |
| 3.9      | 140           | 0.0570        | 0.60              |                | <b>Shallow Concentrated Flow,</b><br>Forest w/Heavy Litter Kv= 2.5 fps |
| 10.1     | 630           | 0.0220        | 1.04              |                | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps   |
| 0.7      | 101           | 0.0200        | 2.28              |                | <b>Shallow Concentrated Flow,</b><br>Unpaved Kv= 16.1 fps              |
| 52.3     | 1,021         | Total         |                   |                |                                                                        |

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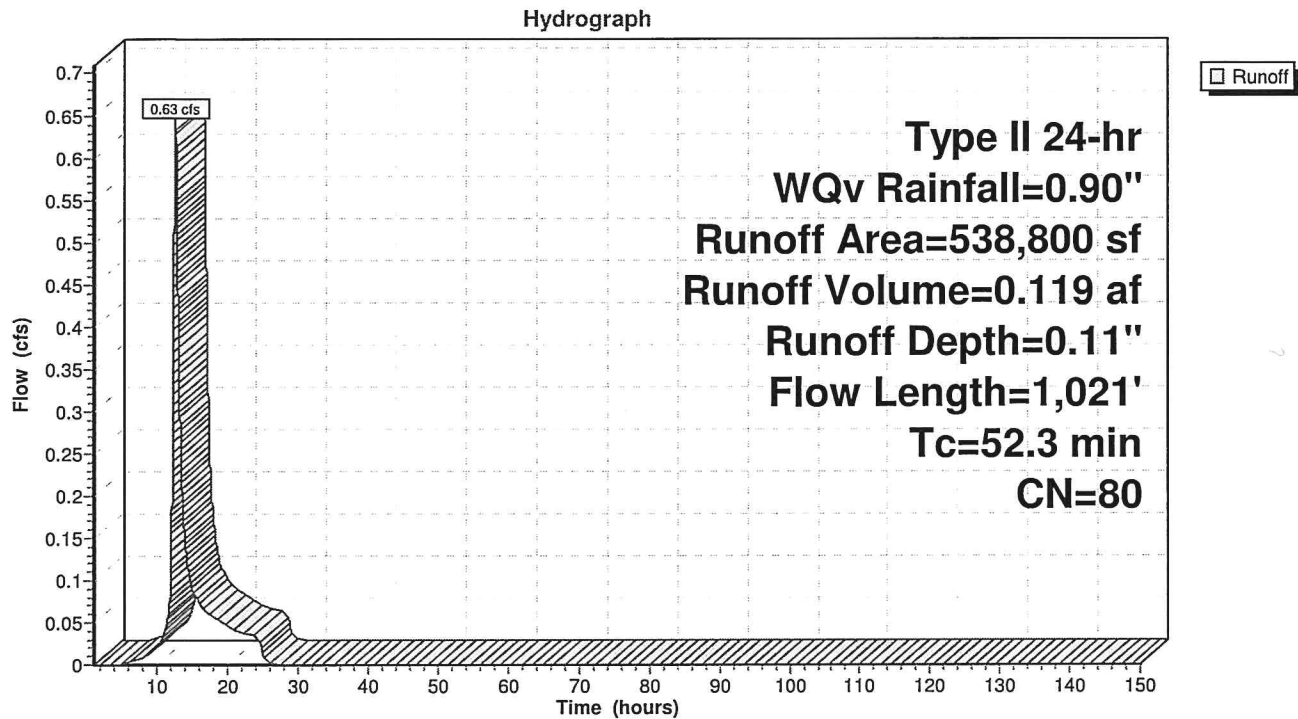
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Type II 24-hr WQv Rainfall=0.90"

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**Subcatchment 7: Off-Site Area to south culvert**



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### Summary for Subcatchment 9: Site Area to north culvert

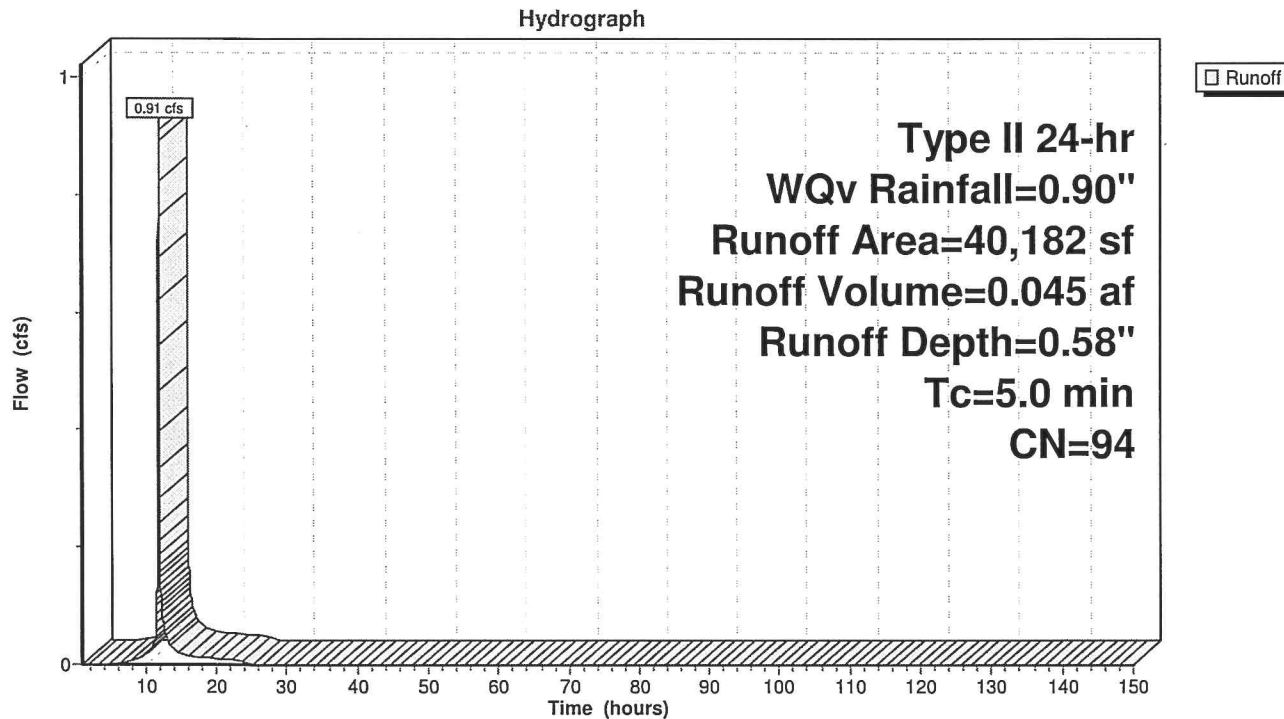
Runoff = 0.91 cfs @ 11.96 hrs, Volume= 0.045 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr WQv Rainfall=0.90"

|   | Area (sf) | CN | Description                   |
|---|-----------|----|-------------------------------|
| * | 33,171    | 98 | Impervious                    |
|   | 3,033     | 80 | >75% Grass cover, Good, HSG D |
|   | 3,033     | 74 | >75% Grass cover, Good, HSG C |
|   | 945       | 80 | >75% Grass cover, Good, HSG D |
|   | 40,182    | 94 | Weighted Average              |
|   | 7,011     |    | 17.45% Pervious Area          |
|   | 33,171    |    | 82.55% Impervious Area        |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description   |
|-------------|------------------|------------------|----------------------|-------------------|---------------|
| 5.0         |                  |                  |                      |                   | Direct Entry, |

### Subcatchment 9: Site Area to north culvert



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### Summary for Subcatchment 10: Off-Site Area to north culvert

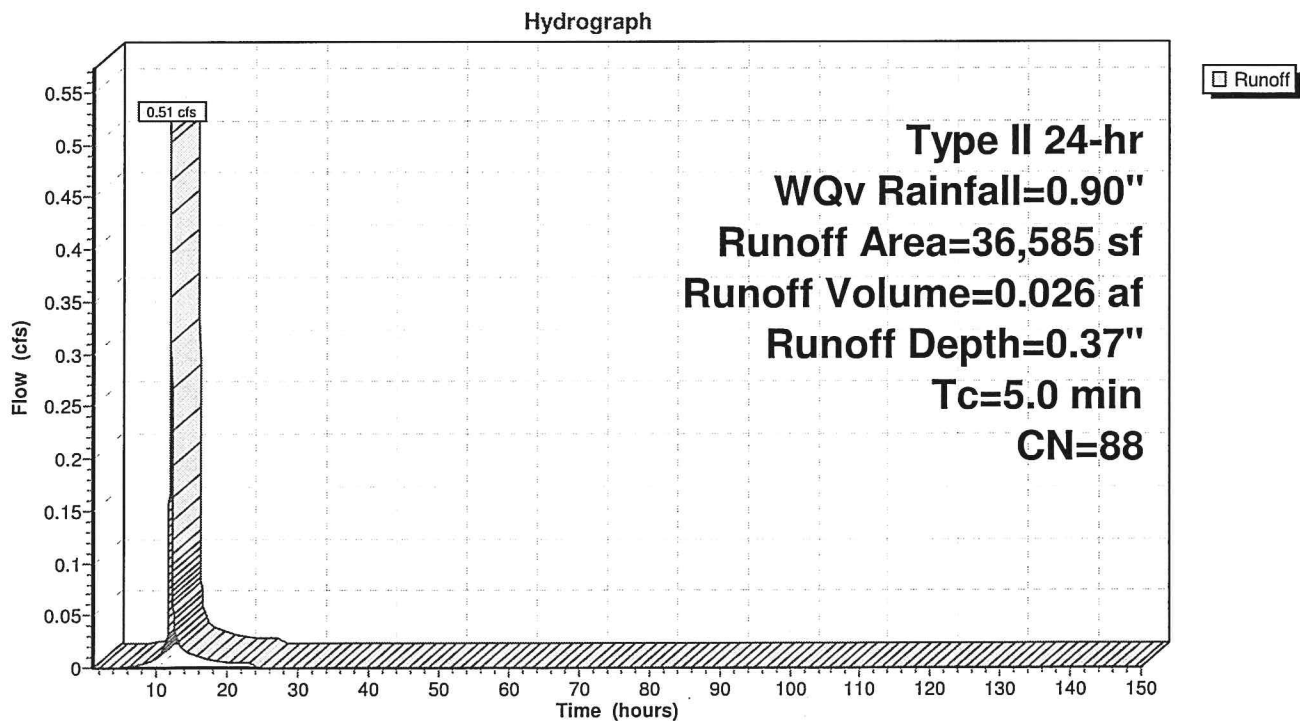
Runoff = 0.51 cfs @ 11.96 hrs, Volume= 0.026 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr WQv Rainfall=0.90"

| Area (sf) | CN | Description                   |
|-----------|----|-------------------------------|
| 6,327     | 74 | >75% Grass cover, Good, HSG C |
| 11,732    | 80 | >75% Grass cover, Good, HSG D |
| * 18,526  | 98 | Paved or roof                 |
| 36,585    | 88 | Weighted Average              |
| 18,059    |    | 49.36% Pervious Area          |
| 18,526    |    | 50.64% Impervious Area        |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description   |
|----------|---------------|---------------|-------------------|----------------|---------------|
| 5.0      |               |               |                   |                | Direct Entry, |

### Subcatchment 10: Off-Site Area to north culvert





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Type II 24-hr WQv Rainfall=0.9

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### Summary for Reach 2a: Treatment Swale #1-WQv

Inflow Area = 2.320 ac, 0.00% Impervious, Inflow Depth = 0.37" for WQv event  
Inflow = 0.72 cfs @ 12.26 hrs, Volume= 0.072 af  
Outflow = 0.43 cfs @ 13.03 hrs, Volume= 0.072 af, Atten= 41%, Lag= 46.4 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs

Max. Velocity= 0.32 fps, Min. Travel Time= 30.1 min

Avg. Velocity = 0.08 fps, Avg. Travel Time= 123.0 min

Peak Storage= 771 cf @ 12.53 hrs

Average Depth at Peak Storage= 0.33'

Bank-Full Depth= 1.25' Flow Area= 8.4 sf, Capacity= 5.53 cfs

3.00' x 1.25' deep channel, n= 0.150 Sheet flow over Short Grass

Side Slope Z-value= 3.0 '/' Top Width= 10.50'

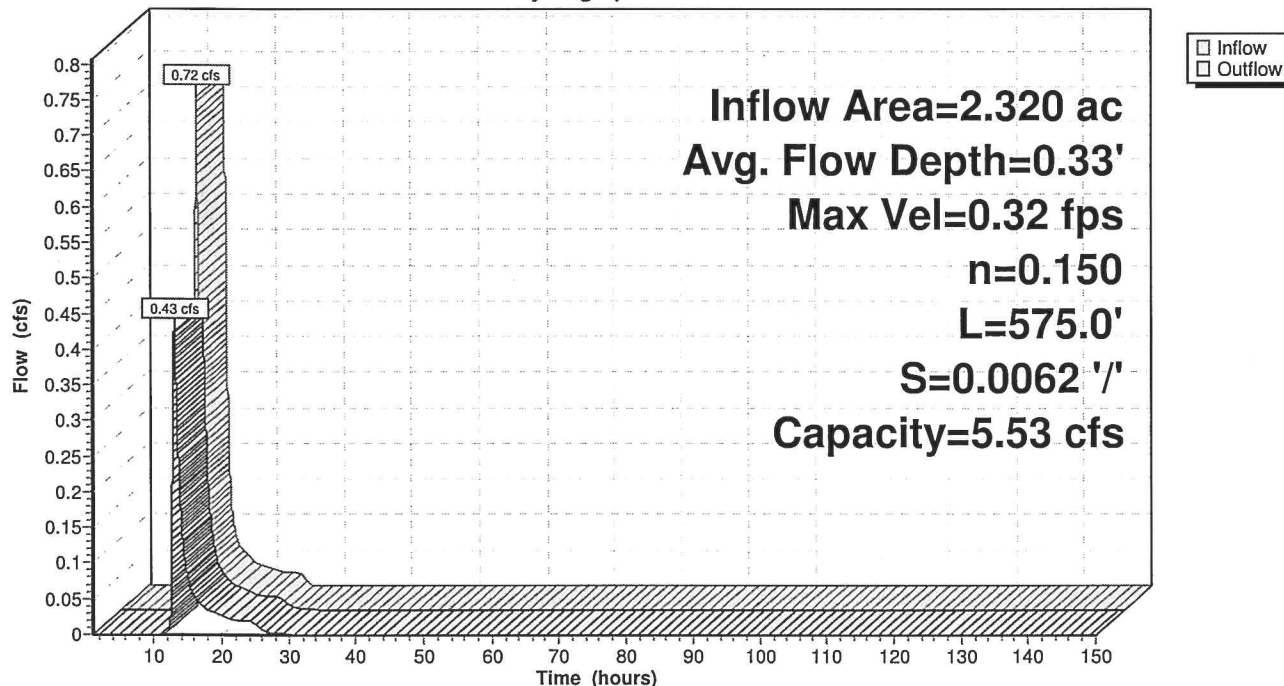
Length= 575.0' Slope= 0.0062 '/'

Inlet Invert= 170.46', Outlet Invert= 166.92'



### Reach 2a: Treatment Swale #1-WQv

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**Summary for Pond 5: Forebay and Main Cell**

Inflow Area = 3.282 ac, 20.83% Impervious, Inflow Depth = 0.41" for WQv event  
 Inflow = 0.80 cfs @ 11.95 hrs, Volume= 0.113 af  
 Outflow = 0.04 cfs @ 18.21 hrs, Volume= 0.113 af, Atten= 94%, Lag= 375.7 min  
 Primary = 0.04 cfs @ 18.21 hrs, Volume= 0.113 af

Routing by Stor-Ind method, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs

Starting Elev= 164.17' Surf.Area= 4,526 sf Storage= 6,663 cf

Peak Elev= 164.81' @ 18.21 hrs Surf.Area= 5,308 sf Storage= 9,812 cf (3,149 cf above start)

Flood Elev= 166.80' Surf.Area= 7,871 sf Storage= 22,889 cf (16,226 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 979.7 min ( 1,872.6 - 892.9 )

| Volume | Invert  | Avail.Storage | Storage Description                                        |
|--------|---------|---------------|------------------------------------------------------------|
| #1     | 160.17' | 22,889 cf     | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |

| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 160.17              | 66                   | 0                         | 0                         |
| 161.00              | 196                  | 109                       | 109                       |
| 162.00              | 383                  | 290                       | 398                       |
| 162.80              | 2,872                | 1,302                     | 1,700                     |
| 163.80              | 3,926                | 3,399                     | 5,099                     |
| 164.17              | 4,526                | 1,564                     | 6,663                     |
| 165.00              | 5,539                | 4,177                     | 10,840                    |
| 166.00              | 6,812                | 6,176                     | 17,015                    |
| 166.80              | 7,871                | 5,873                     | 22,889                    |

| Device | Routing  | Invert  | Outlet Devices                                                                                                                                                                                                           |
|--------|----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary  | 164.17' | <b>24.0" Round Culvert</b><br>L= 28.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 164.17' / 164.03' S= 0.0050 ' S= 0.0050 ' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |
| #2     | Device 1 | 164.17' | <b>1.5" Vert. Orifice/Grate</b> C= 0.600                                                                                                                                                                                 |
| #3     | Device 1 | 166.00' | <b>6.0' long x 0.25' rise Sharp-Crested Rectangular Weir</b><br>2 End Contraction(s)                                                                                                                                     |

**Primary OutFlow** Max=0.04 cfs @ 18.21 hrs HW=164.81' (Free Discharge)

1=Culvert (Passes 0.04 cfs of 1.70 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.04 cfs @ 3.66 fps)

3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)

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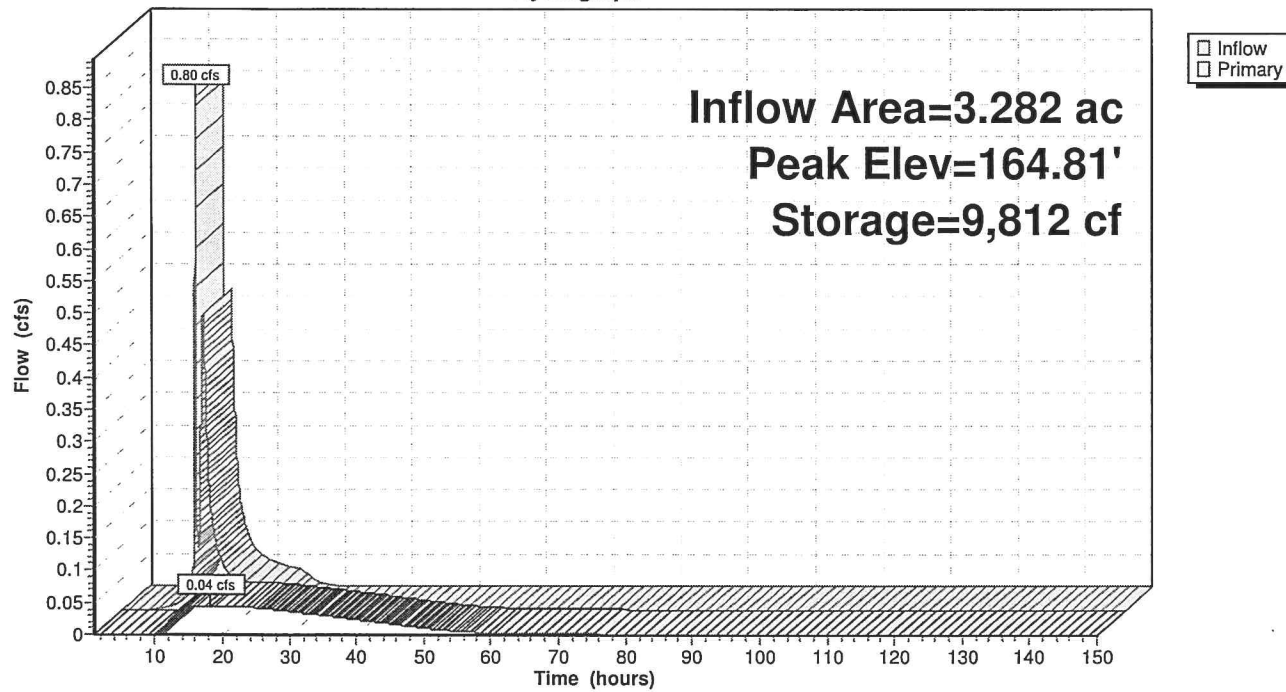
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Type II 24-hr WQv Rainfall=0.9

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### Pond 5: Forebay and Main Cell

Hydrograph



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**Summary for Pond 8: roadside ditch and south culvert**

Inflow Area = 15.838 ac, 13.97% Impervious, Inflow Depth = 0.18" for WQv event  
 Inflow = 0.68 cfs @ 12.50 hrs, Volume= 0.236 af  
 Outflow = 0.68 cfs @ 12.51 hrs, Volume= 0.236 af, Atten= 0%, Lag= 0.3 min  
 Primary = 0.68 cfs @ 12.51 hrs, Volume= 0.236 af

Routing by Stor-Ind method, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
 Peak Elev= 164.11' @ 12.51 hrs Surf.Area= 39 sf Storage= 3 cf  
 Flood Elev= 166.40' Surf.Area= 2,150 sf Storage= 2,252 cf

Plug-Flow detention time= 0.0 min calculated for 0.236 af (100% of inflow)  
 Center-of-Mass det. time= 0.0 min ( 1,361.2 - 1,361.2 )

| Volume | Invert  | Avail.Storage | Storage Description                                        |
|--------|---------|---------------|------------------------------------------------------------|
| #1     | 163.75' | 2,273 cf      | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |

| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 163.75              | 1                    | 0                         | 0                         |
| 164.00              | 5                    | 1                         | 1                         |
| 165.00              | 320                  | 163                       | 163                       |
| 166.00              | 2,141                | 1,231                     | 1,394                     |
| 166.41              | 2,150                | 880                       | 2,273                     |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                    |
|--------|---------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 163.60' | <b>24.0" Round Culvert</b><br>L= 68.0' CMP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 163.60' / 163.55' S= 0.0007 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |

**Primary OutFlow** Max=0.68 cfs @ 12.51 hrs HW=164.11' (Free Discharge)

**1=Culvert** (Barrel Controls 0.68 cfs @ 1.64 fps)

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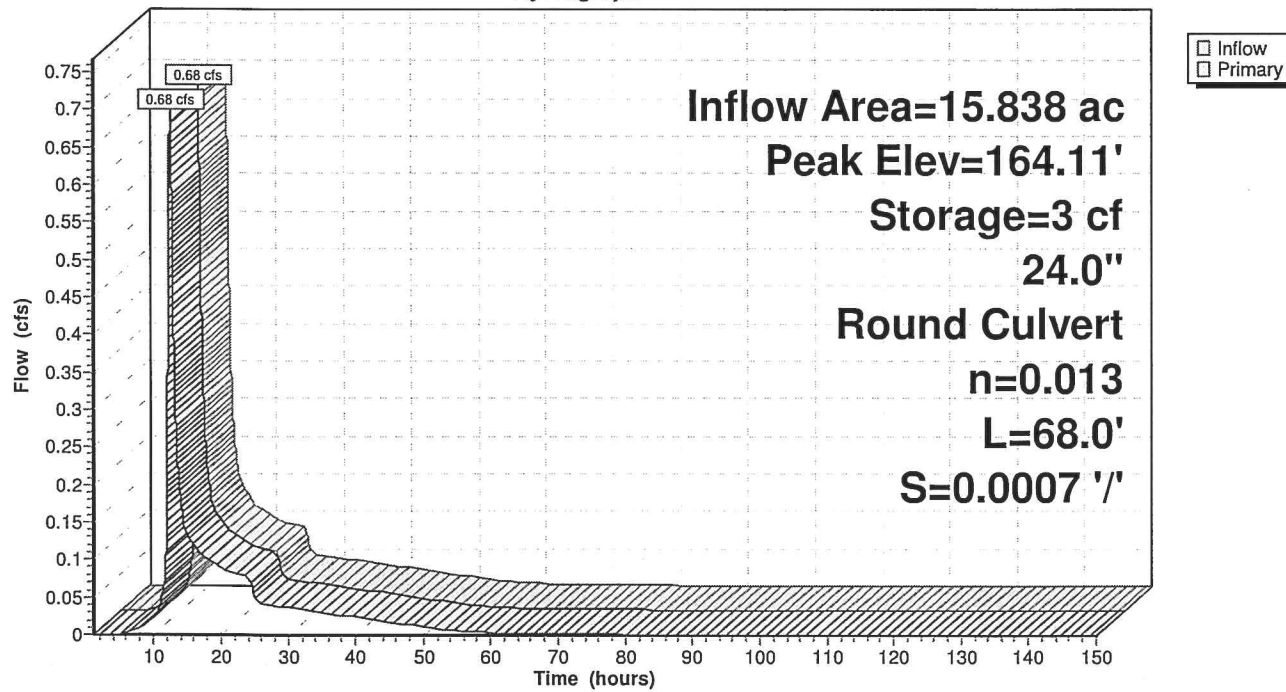
Rhino Food  
Type II 24-hr WQv Rainfall=0.9

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### Pond 8: roadside ditch and south culvert

Hydrograph



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Type II 24-hr WQv Rainfall=0.90"

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**Summary for Pond 11: roadside ditch and north culvert**

Inflow Area = 17.600 ac, 19.31% Impervious, Inflow Depth = 0.21" for WQv event  
 Inflow = 1.58 cfs @ 11.96 hrs, Volume= 0.306 af  
 Outflow = 1.58 cfs @ 11.97 hrs, Volume= 0.306 af, Atten= 0%, Lag= 0.4 min  
 Primary = 1.58 cfs @ 11.97 hrs, Volume= 0.306 af

Routing by Stor-Ind method, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs

Peak Elev= 161.58' @ 11.97 hrs Surf.Area= 125 sf Storage= 40 cf

Plug-Flow detention time= 0.7 min calculated for 0.306 af (100% of inflow)

Center-of-Mass det. time= 0.7 min ( 1,230.9 - 1,230.2 )

| Volume | Invert  | Avail.Storage | Storage Description                                        |
|--------|---------|---------------|------------------------------------------------------------|
| #1     | 161.00' | 557 cf        | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |

| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 161.00              | 12                   | 0                         | 0                         |
| 162.00              | 207                  | 110                       | 110                       |
| 162.38              | 367                  | 109                       | 219                       |
| 163.00              | 726                  | 339                       | 557                       |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                            |
|--------|---------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 161.00' | <b>24.0" Round Culvert</b><br>L= 215.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 161.00' / 159.93' S= 0.0050 ' S= 0.0050 ' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |

**Primary OutFlow** Max=1.58 cfs @ 11.97 hrs HW=161.58' (Free Discharge)**1=Culvert** (Barrel Controls 1.58 cfs @ 3.14 fps)



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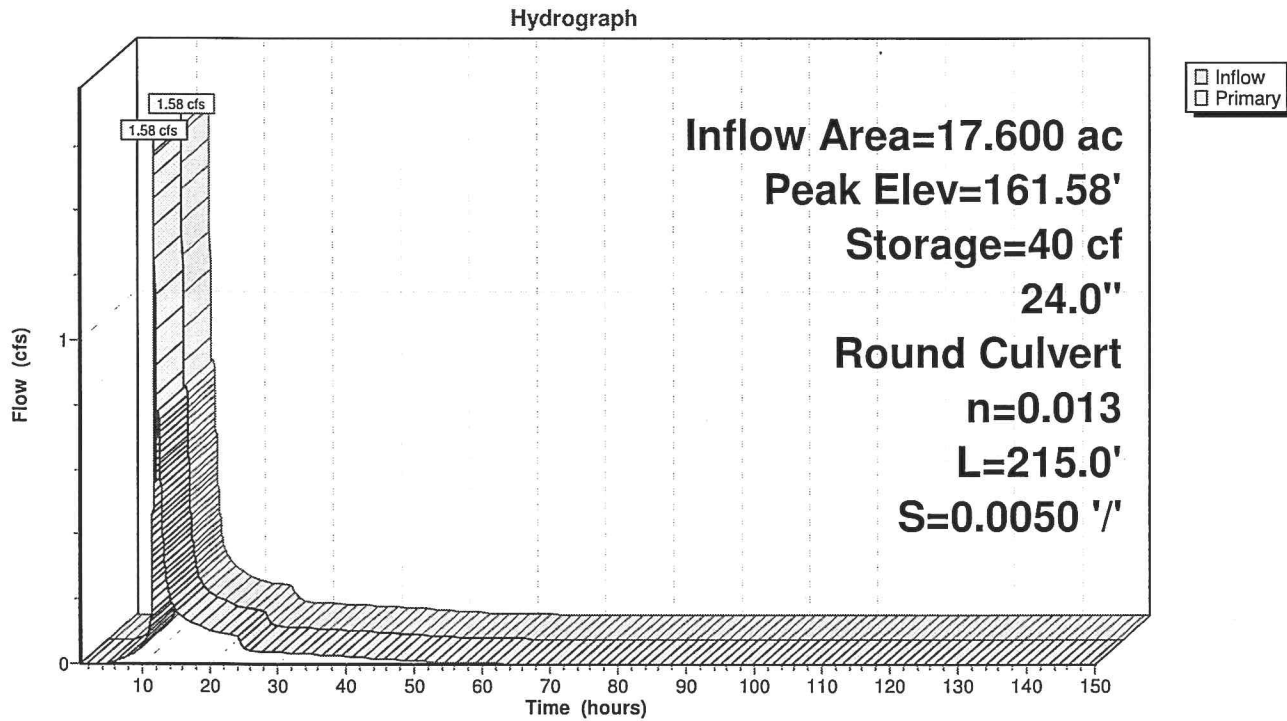
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### Pond 11: roadside ditch and north culvert



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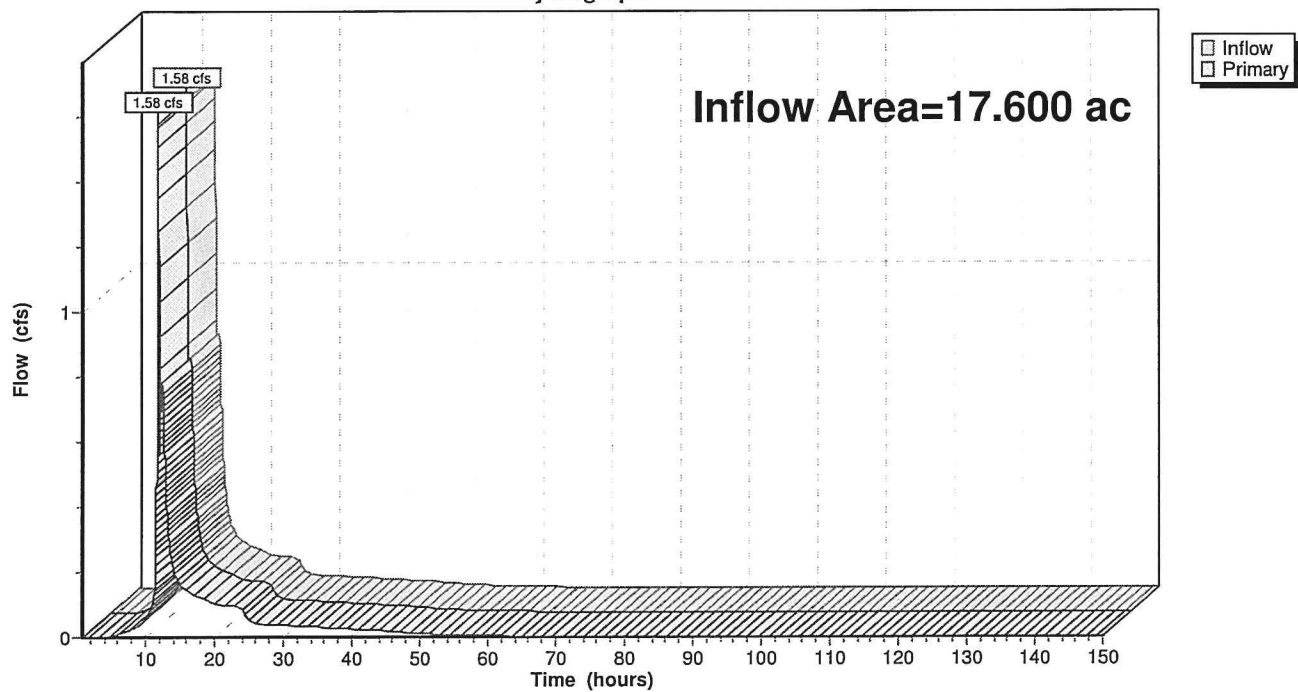
### Summary for Link 12: POI1

Inflow Area = 17.600 ac, 19.31% Impervious, Inflow Depth = 0.21" for WQv event  
Inflow = 1.58 cfs @ 11.97 hrs, Volume= 0.306 af  
Primary = 1.58 cfs @ 11.97 hrs, Volume= 0.306 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs

### Link 12: POI1

Hydrograph



# **1-Year Storm**

Post Development

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Type II 24-hr 1-yr Rainfall=2.10"

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**Summary for Subcatchment 1b: To TS#1-1,10,25**

Runoff = 1.84 cfs @ 12.26 hrs, Volume= 0.200 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr 1-yr Rainfall=2.10"

|   | Area (sf) | CN | Description                            |
|---|-----------|----|----------------------------------------|
| * | 2,200     | 98 | EXTRA IMPERVIOUS                       |
| * | 27,016    | 98 | Pavement                               |
|   | 13,842    | 80 | >75% Grass cover, Good, HSG D          |
|   | 7,883     | 74 | >75% Grass cover, Good, HSG C          |
|   | 7,883     | 80 | >75% Grass cover, Good, HSG D          |
| * | 5,380     | 98 | Off-site Roof                          |
| * | 4,407     | 98 | off-site roof                          |
| * | 23,203    | 77 | off-site Woods, Good, HSG D            |
|   | 7,452     | 70 | off-site Woods, Good, HSG C            |
|   | 887       | 80 | off-site >75% Grass cover, Good, HSG D |
|   | 888       | 74 | off-site >75% Grass cover, Good, HSG C |
|   | 101,041   | 85 | Weighted Average                       |
|   | 62,038    |    | 61.40% Pervious Area                   |
|   | 39,003    |    | 38.60% Impervious Area                 |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                            |
|-------------|------------------|------------------|----------------------|-------------------|------------------------------------------------------------------------|
| 23.2        | 100              | 0.1000           | 0.07                 |                   | <b>Sheet Flow,</b><br>Woods: Dense underbrush n= 0.800 P2= 2.30"       |
| 4.4         | 120              | 0.0333           | 0.46                 |                   | <b>Shallow Concentrated Flow,</b><br>Forest w/Heavy Litter Kv= 2.5 fps |
| 3.3         | 300              | 0.0100           | 1.50                 |                   | <b>Shallow Concentrated Flow,</b><br>Grassed Waterway Kv= 15.0 fps     |
| 30.9        | 520              | Total            |                      |                   |                                                                        |

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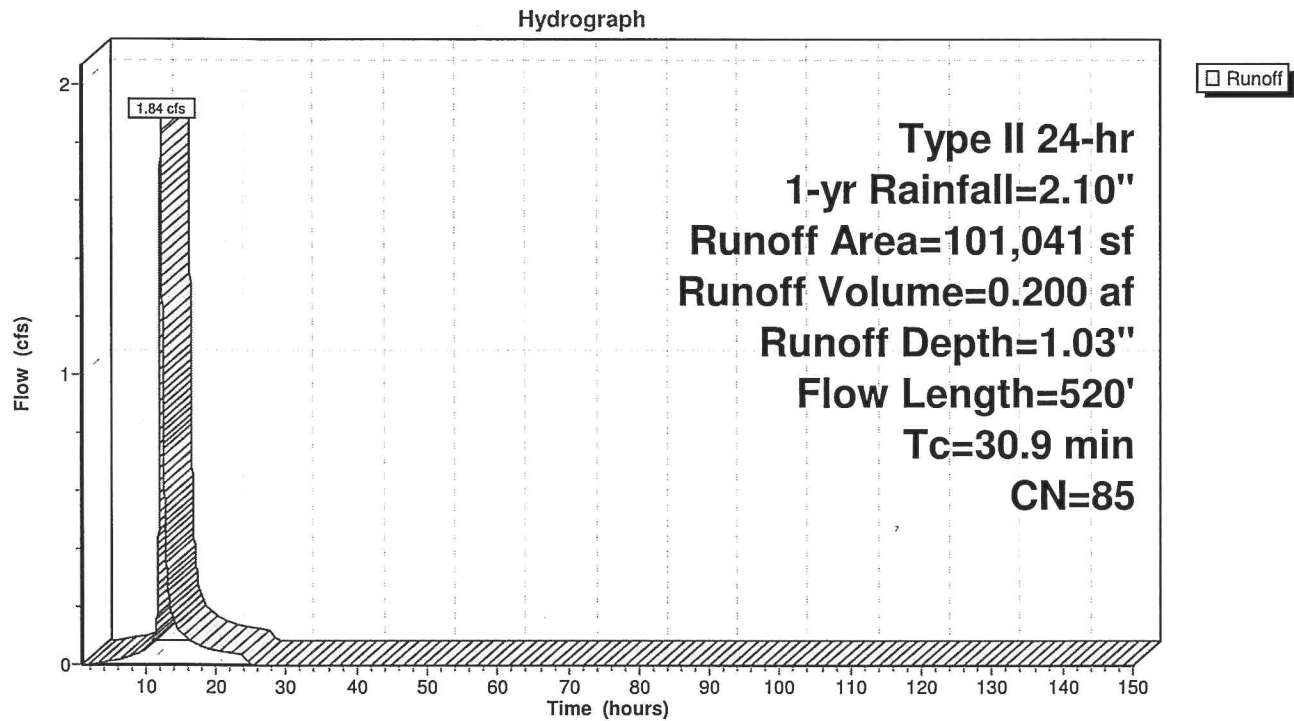
Rhino Food

Type II 24-hr 1-yr Rainfall=2.10"

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**Subcatchment 1b: To TS#1-1,10,25**



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Type II 24-hr 1-yr Rainfall=2.10"

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### Summary for Subcatchment 3: Site Area to forebay

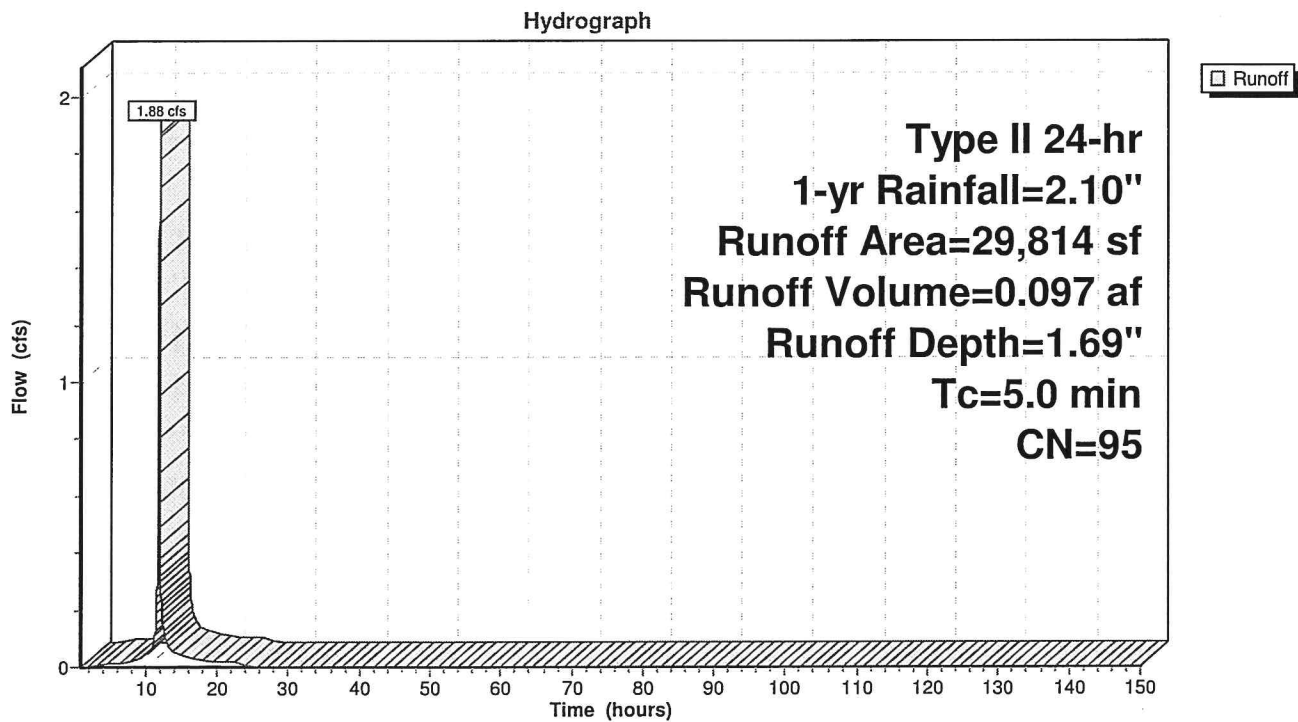
Runoff = 1.88 cfs @ 11.96 hrs, Volume= 0.097 af, Depth= 1.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr 1-yr Rainfall=2.10"

|   | Area (sf) | CN | Description                   |
|---|-----------|----|-------------------------------|
| * | 25,509    | 98 | Paved parking and roof        |
|   | 4,305     | 80 | >75% Grass cover, Good, HSG D |
|   | 29,814    | 95 | Weighted Average              |
|   | 4,305     |    | 14.44% Pervious Area          |
|   | 25,509    |    | 85.56% Impervious Area        |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description   |
|-------------|------------------|------------------|----------------------|-------------------|---------------|
| 5.0         |                  |                  |                      |                   | Direct Entry, |

### Subcatchment 3: Site Area to forebay





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Type II 24-hr 1-yr Rainfall=2.10"

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**Summary for Subcatchment 4: Directly to main cell**

Runoff = 0.55 cfs @ 11.91 hrs, Volume= 0.024 af, Depth= 1.03"

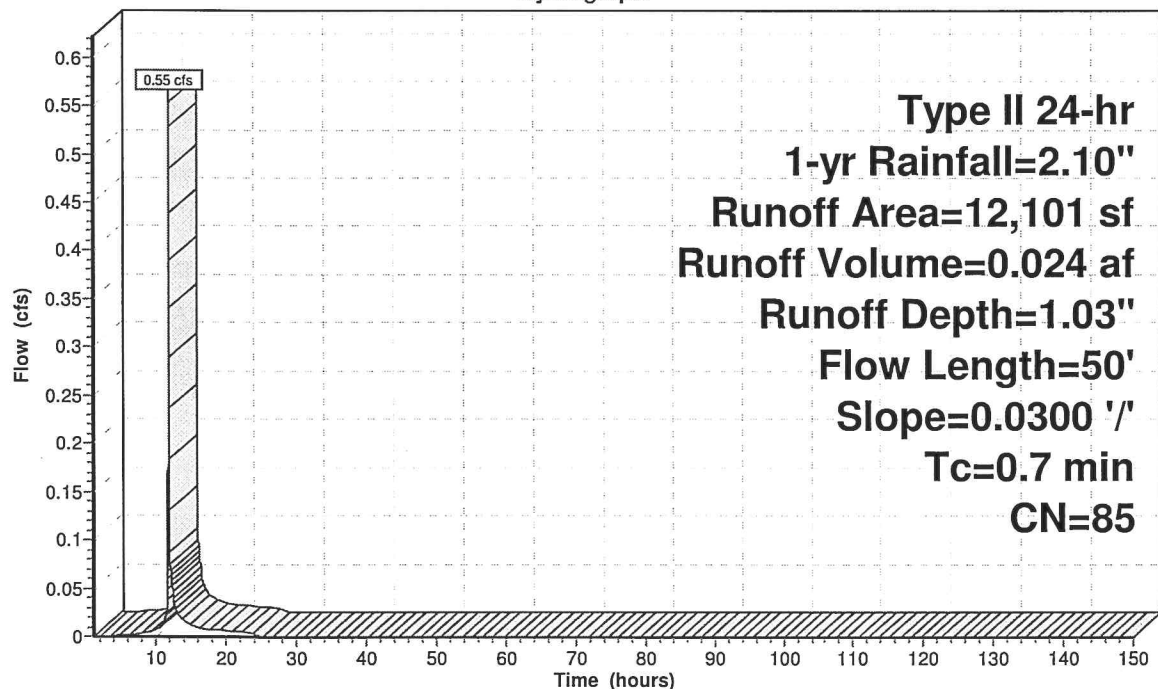
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr 1-yr Rainfall=2.10"

|   | Area (sf) | CN | Description                   |
|---|-----------|----|-------------------------------|
| * | 4,267     | 98 | Paved and Roof                |
|   | 3,742     | 80 | >75% Grass cover, Good, HSG D |
|   | 2,046     | 80 | >75% Grass cover, Good, HSG D |
|   | 2,046     | 74 | >75% Grass cover, Good, HSG C |
|   | 12,101    | 85 | Weighted Average              |
|   | 7,834     |    | 64.74% Pervious Area          |
|   | 4,267     |    | 35.26% Impervious Area        |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                       |
|-------------|------------------|------------------|----------------------|-------------------|---------------------------------------------------|
| 0.7         | 50               | 0.0300           | 1.19                 |                   | Sheet Flow,<br>Smooth surfaces n= 0.011 P2= 2.30" |

**Subcatchment 4: Directly to main cell**

Hydrograph



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Type II 24-hr 1-yr Rainfall=2.10"

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**Summary for Subcatchment 6: On-Site Area to south culvert**

Runoff = 0.10 cfs @ 12.50 hrs, Volume= 0.016 af, Depth= 1.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr 1-yr Rainfall=2.10"

| Area (sf) | CN | Description                   |
|-----------|----|-------------------------------|
| 2,040     | 74 | >75% Grass cover, Good, HSG C |
| 2,040     | 80 | >75% Grass cover, Good, HSG D |
| 1,250     | 80 | >75% Grass cover, Good, HSG D |
| 2,801     | 98 | Paved parking, HSG D          |
| 8,131     | 85 | Weighted Average              |
| 5,330     |    | 65.55% Pervious Area          |
| 2,801     |    | 34.45% Impervious Area        |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                            |
|----------|---------------|---------------|-------------------|----------------|------------------------------------------------------------------------|
| 37.6     | 150           | 0.0670        | 0.07              |                | <b>Sheet Flow,</b><br>Woods: Dense underbrush n= 0.800 P2= 2.30"       |
| 3.9      | 140           | 0.0570        | 0.60              |                | <b>Shallow Concentrated Flow,</b><br>Forest w/Heavy Litter Kv= 2.5 fps |
| 10.1     | 630           | 0.0220        | 1.04              |                | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps   |
| 0.7      | 101           | 0.0200        | 2.28              |                | <b>Shallow Concentrated Flow,</b><br>Unpaved Kv= 16.1 fps              |
| 52.3     | 1,021         | Total         |                   |                |                                                                        |

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Rhino Food

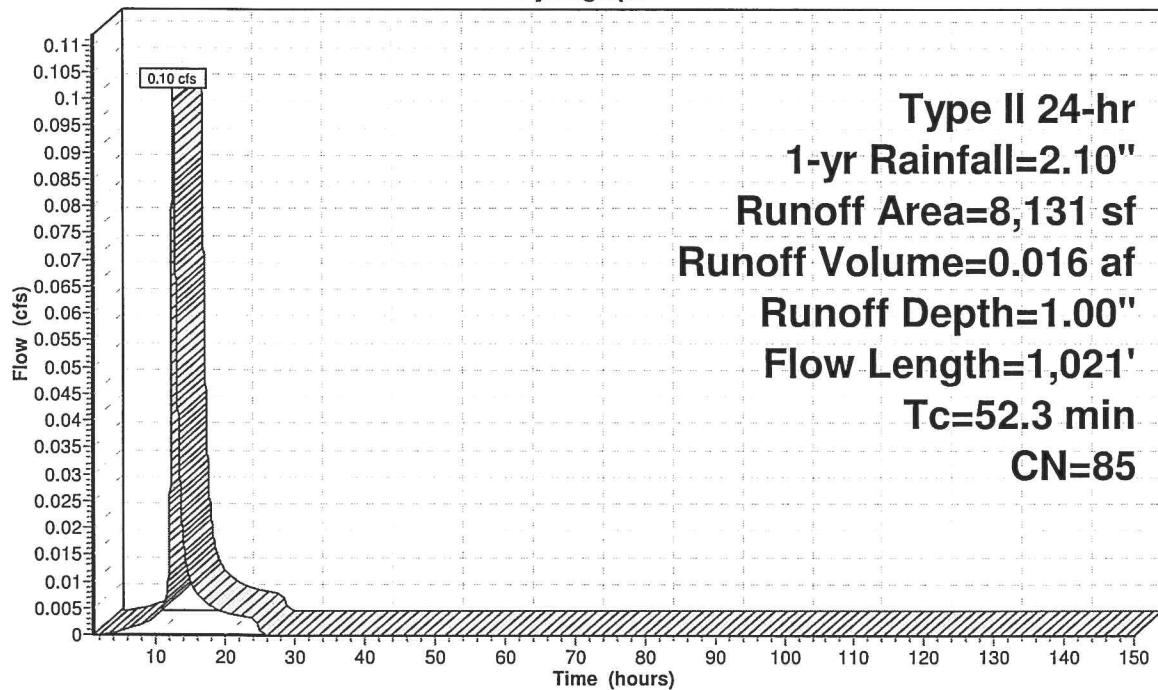
Type II 24-hr 1-yr Rainfall=2.10

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### Subcatchment 6: On-Site Area to south culvert

Hydrograph



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Rhino Foods

Type II 24-hr 1-yr Rainfall=2.10"

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**Summary for Subcatchment 7: Off-Site Area to south culvert**

Runoff = 4.46 cfs @ 12.55 hrs, Volume= 0.718 af, Depth= 0.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr 1-yr Rainfall=2.10"

| Area (sf) | CN | Description                   |
|-----------|----|-------------------------------|
| 143,594   | 77 | Woods, Good, HSG D            |
| 0         | 70 | Woods, Good, HSG C            |
| 103,187   | 74 | >75% Grass cover, Good, HSG C |
| 103,187   | 80 | >75% Grass cover, Good, HSG D |
| 125,044   | 80 | >75% Grass cover, Good, HSG D |
| * 63,788  | 98 | Paved or roof                 |
| 538,800   | 80 | Weighted Average              |
| 475,012   |    | 88.16% Pervious Area          |
| 63,788    |    | 11.84% Impervious Area        |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                            |
|----------|---------------|---------------|-------------------|----------------|------------------------------------------------------------------------|
| 37.6     | 150           | 0.0670        | 0.07              |                | <b>Sheet Flow,</b><br>Woods: Dense underbrush n= 0.800 P2= 2.30"       |
| 3.9      | 140           | 0.0570        | 0.60              |                | <b>Shallow Concentrated Flow,</b><br>Forest w/Heavy Litter Kv= 2.5 fps |
| 10.1     | 630           | 0.0220        | 1.04              |                | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps   |
| 0.7      | 101           | 0.0200        | 2.28              |                | <b>Shallow Concentrated Flow,</b><br>Unpaved Kv= 16.1 fps              |
| 52.3     | 1,021         | Total         |                   |                |                                                                        |

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Rhino Food

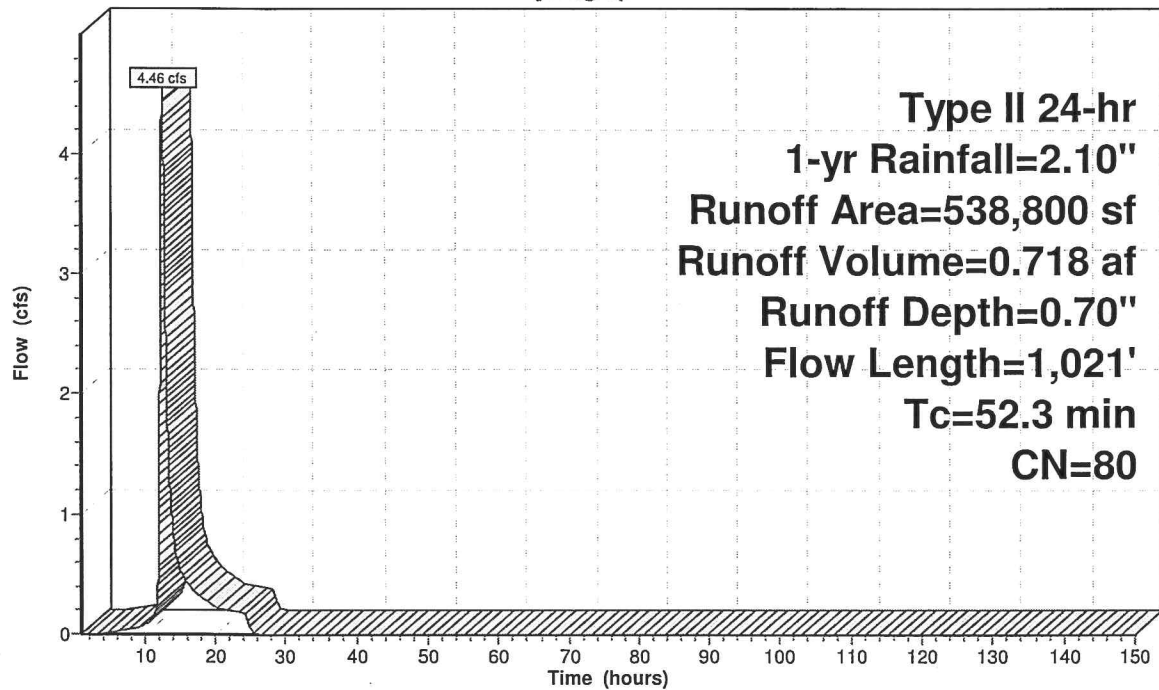
Type II 24-hr 1-yr Rainfall=2.10

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### Subcatchment 7: Off-Site Area to south culvert

Hydrograph



Runoff

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Rhino Foods  
Type II 24-hr 1-yr Rainfall=2.10"

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### Summary for Subcatchment 9: Site Area to north culvert

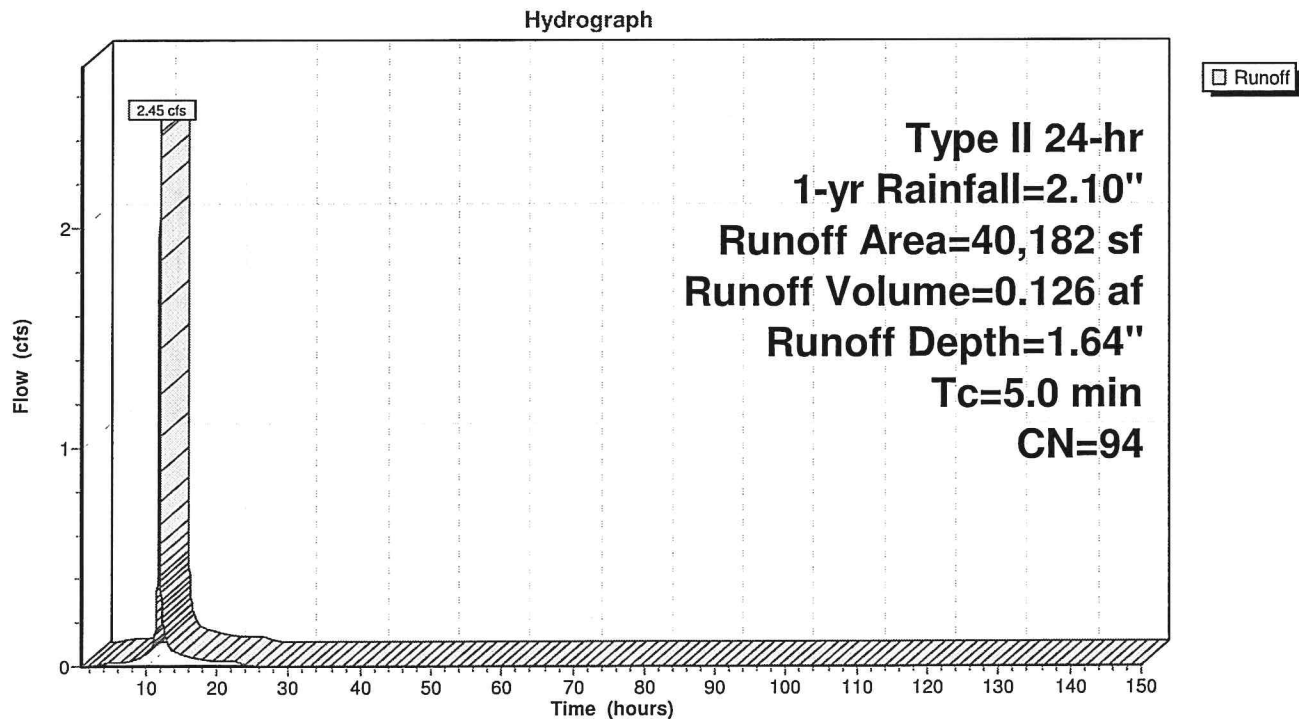
Runoff = 2.45 cfs @ 11.96 hrs, Volume= 0.126 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr 1-yr Rainfall=2.10"

|   | Area (sf) | CN | Description                   |
|---|-----------|----|-------------------------------|
| * | 33,171    | 98 | Impervious                    |
|   | 3,033     | 80 | >75% Grass cover, Good, HSG D |
|   | 3,033     | 74 | >75% Grass cover, Good, HSG C |
|   | 945       | 80 | >75% Grass cover, Good, HSG D |
|   | 40,182    | 94 | Weighted Average              |
|   | 7,011     |    | 17.45% Pervious Area          |
|   | 33,171    |    | 82.55% Impervious Area        |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description   |
|-------------|------------------|------------------|----------------------|-------------------|---------------|
| 5.0         |                  |                  |                      |                   | Direct Entry, |

### Subcatchment 9: Site Area to north culvert





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Type II 24-hr 1-yr Rainfall=2.10

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### Summary for Subcatchment 10: Off-Site Area to north culvert

Runoff = 1.68 cfs @ 11.96 hrs, Volume= 0.085 af, Depth= 1.22"

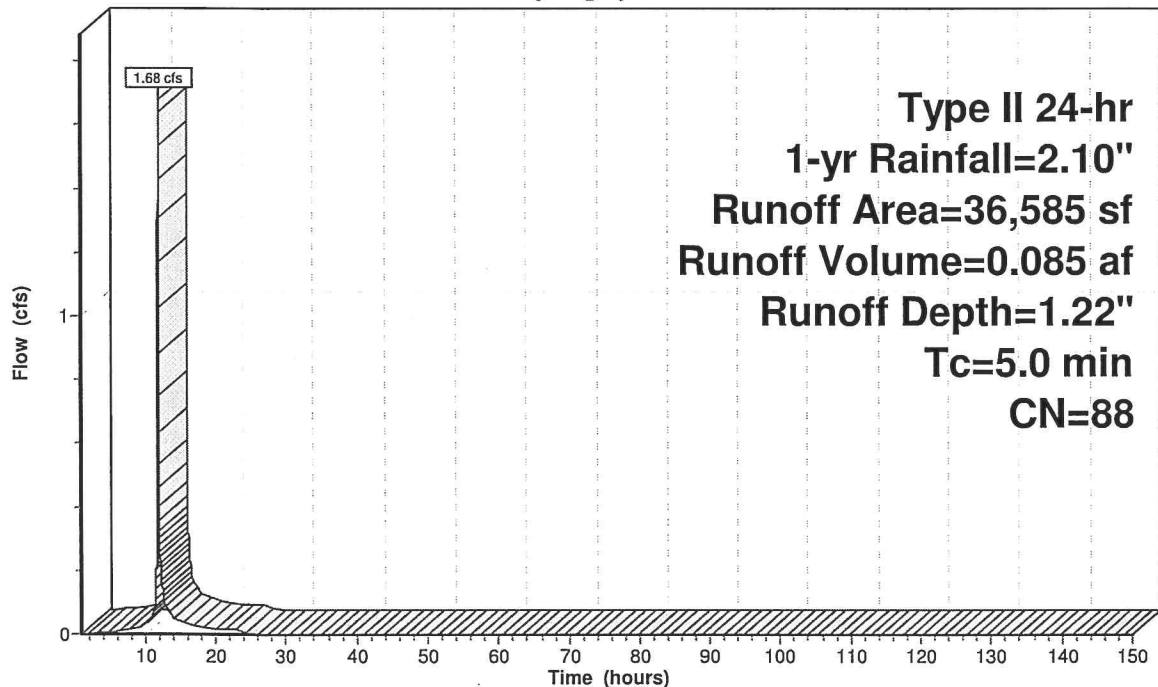
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr 1-yr Rainfall=2.10"

| Area (sf) | CN | Description                   |
|-----------|----|-------------------------------|
| 6,327     | 74 | >75% Grass cover, Good, HSG C |
| 11,732    | 80 | >75% Grass cover, Good, HSG D |
| * 18,526  | 98 | Paved or roof                 |
| 36,585    | 88 | Weighted Average              |
| 18,059    |    | 49.36% Pervious Area          |
| 18,526    |    | 50.64% Impervious Area        |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description   |
|----------|---------------|---------------|-------------------|----------------|---------------|
| 5.0      |               |               |                   |                | Direct Entry, |

### Subcatchment 10: Off-Site Area to north culvert

Hydrograph



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Type II 24-hr 1-yr Rainfall=2.10"

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### Summary for Reach 2b: Treatment Swale #1-1yr

Inflow Area = 2.320 ac, 38.60% Impervious, Inflow Depth = 1.03" for 1-yr event  
Inflow = 1.84 cfs @ 12.26 hrs, Volume= 0.200 af  
Outflow = 1.41 cfs @ 12.72 hrs, Volume= 0.200 af, Atten= 24%, Lag= 27.8 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs

Max. Velocity= 0.55 fps, Min. Travel Time= 17.3 min

Avg. Velocity = 0.13 fps, Avg. Travel Time= 73.4 min

Peak Storage= 1,461 cf @ 12.43 hrs

Average Depth at Peak Storage= 0.55'

Bank-Full Depth= 1.25' Flow Area= 8.4 sf, Capacity= 7.34 cfs

3.00' x 1.25' deep channel, n= 0.113

Side Slope Z-value= 3.0 '/' Top Width= 10.50'

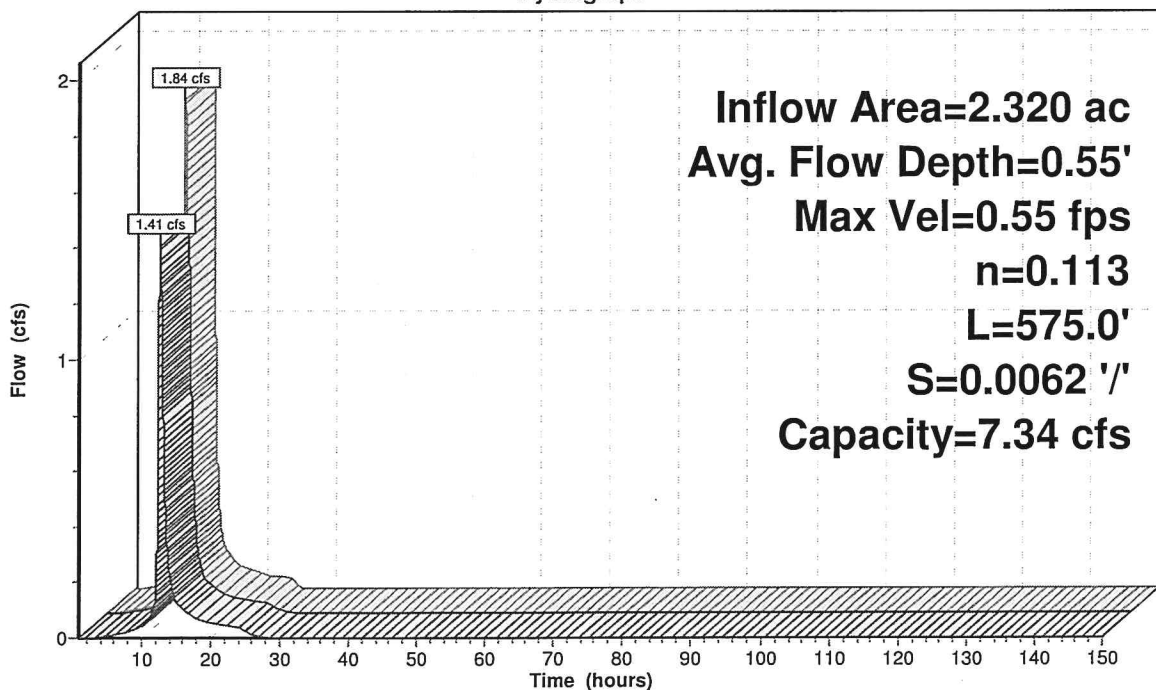
Length= 575.0' Slope= 0.0062 '/'

Inlet Invert= 170.46', Outlet Invert= 166.92'



### Reach 2b: Treatment Swale #1-1yr

Hydrograph



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Type II 24-hr 1-yr Rainfall=2.16

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**Summary for Pond 5: Forebay and Main Cell**

Inflow Area = 3.282 ac, 48.11% Impervious, Inflow Depth = 1.17" for 1-yr event  
 Inflow = 2.38 cfs @ 11.94 hrs, Volume= 0.320 af  
 Outflow = 0.08 cfs @ 20.11 hrs, Volume= 0.320 af, Atten= 97%, Lag= 489.8 min  
 Primary = 0.08 cfs @ 20.11 hrs, Volume= 0.320 af

Routing by Stor-Ind method, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs

Starting Elev= 164.17' Surf.Area= 4,526 sf Storage= 6,663 cf

Peak Elev= 165.99' @ 20.11 hrs Surf.Area= 6,796 sf Storage= 16,930 cf (10,268 cf above start)

Flood Elev= 166.80' Surf.Area= 7,871 sf Storage= 22,889 cf (16,226 cf above start)

Plug-Flow detention time= 2,686.5 min calculated for 0.167 af (52% of inflow)

Center-of-Mass det. time= 1,594.1 min ( 2,427.6 - 833.5 )

| Volume | Invert  | Avail.Storage | Storage Description                                        |
|--------|---------|---------------|------------------------------------------------------------|
| #1     | 160.17' | 22,889 cf     | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |

| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 160.17              | 66                   | 0                         | 0                         |
| 161.00              | 196                  | 109                       | 109                       |
| 162.00              | 383                  | 290                       | 398                       |
| 162.80              | 2,872                | 1,302                     | 1,700                     |
| 163.80              | 3,926                | 3,399                     | 5,099                     |
| 164.17              | 4,526                | 1,564                     | 6,663                     |
| 165.00              | 5,539                | 4,177                     | 10,840                    |
| 166.00              | 6,812                | 6,176                     | 17,015                    |
| 166.80              | 7,871                | 5,873                     | 22,889                    |

| Device | Routing  | Invert  | Outlet Devices                                                                                                                                                                                                   |
|--------|----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary  | 164.17' | <b>24.0" Round Culvert</b><br>L= 28.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 164.17' / 164.03' S= 0.0050 ' / ' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |
| #2     | Device 1 | 164.17' | <b>1.5" Vert. Orifice/Grate</b> C= 0.600                                                                                                                                                                         |
| #3     | Device 1 | 166.00' | <b>6.0' long x 0.25' rise Sharp-Crested Rectangular Weir</b><br>2 End Contraction(s)                                                                                                                             |

**Primary OutFlow** Max=0.08 cfs @ 20.11 hrs HW=165.99' (Free Discharge)

1=Culvert (Passes 0.08 cfs of 10.57 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.08 cfs @ 6.38 fps)

3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)

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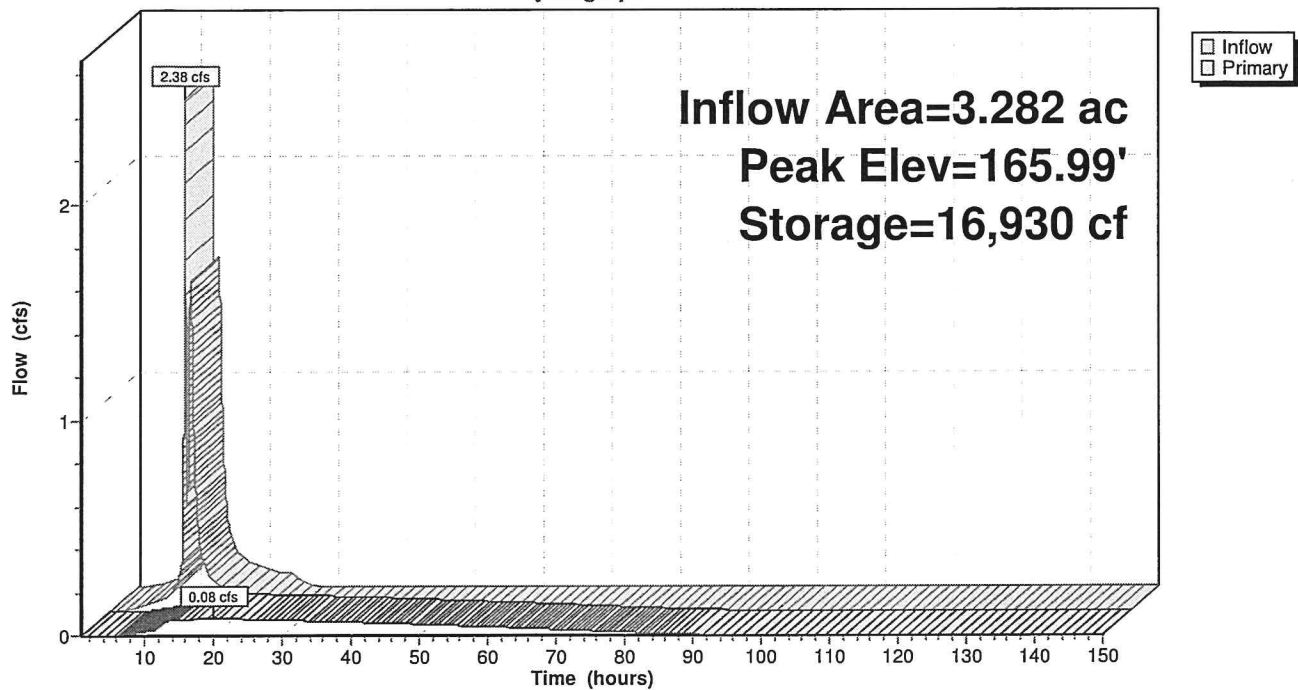
Rhino Foods  
Type II 24-hr 1-yr Rainfall=2.10"

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### Pond 5: Forebay and Main Cell

Hydrograph



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Type II 24-hr 1-yr Rainfall=2.1

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**Summary for Pond 8: roadside ditch and south culvert**

Inflow Area = 15.838 ac, 19.62% Impervious, Inflow Depth = 0.80" for 1-yr event  
 Inflow = 4.61 cfs @ 12.55 hrs, Volume= 1.053 af  
 Outflow = 4.61 cfs @ 12.57 hrs, Volume= 1.053 af, Atten= 0%, Lag= 0.8 min  
 Primary = 4.61 cfs @ 12.57 hrs, Volume= 1.053 af

Routing by Stor-Ind method, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
 Peak Elev= 164.92' @ 12.57 hrs Surf.Area= 294 sf Storage= 138 cf  
 Flood Elev= 166.40' Surf.Area= 2,150 sf Storage= 2,252 cf

Plug-Flow detention time= 0.2 min calculated for 1.053 af (100% of inflow)  
 Center-of-Mass det. time= 0.2 min ( 1,349.8 - 1,349.6 )

| Volume | Invert  | Avail.Storage | Storage Description                                        |
|--------|---------|---------------|------------------------------------------------------------|
| #1     | 163.75' | 2,273 cf      | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |

| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 163.75              | 1                    | 0                         | 0                         |
| 164.00              | 5                    | 1                         | 1                         |
| 165.00              | 320                  | 163                       | 163                       |
| 166.00              | 2,141                | 1,231                     | 1,394                     |
| 166.41              | 2,150                | 880                       | 2,273                     |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                              |
|--------|---------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 163.60' | <b>24.0" Round Culvert</b><br>L= 68.0' CMP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 163.60' / 163.55' S= 0.0007 ' S= 0.0007 ' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |

**Primary OutFlow** Max=4.61 cfs @ 12.57 hrs HW=164.92' (Free Discharge)  
 1=Culvert (Barrel Controls 4.61 cfs @ 2.98 fps)

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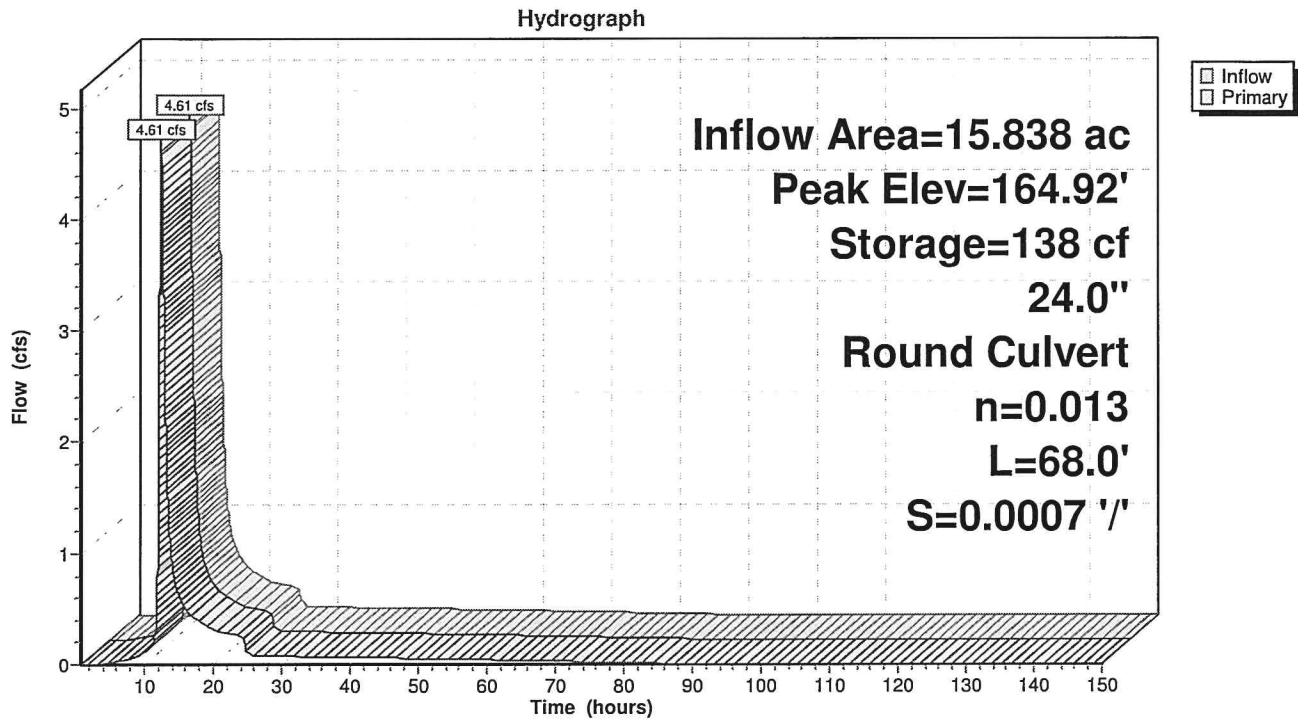
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Type II 24-hr 1-yr Rainfall=2.10"

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**Pond 8: roadside ditch and south culvert**





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Type II 24-hr 1-yr Rainfall=2.1

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**Summary for Pond 11: roadside ditch and north culvert**

Inflow Area = 17.600 ac, 24.40% Impervious, Inflow Depth = 0.86" for 1-yr event  
 Inflow = 4.89 cfs @ 12.55 hrs, Volume= 1.264 af  
 Outflow = 4.89 cfs @ 12.56 hrs, Volume= 1.264 af, Atten= 0%, Lag= 0.3 min  
 Primary = 4.89 cfs @ 12.56 hrs, Volume= 1.264 af

Routing by Stor-Ind method, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
 Peak Elev= 162.06' @ 12.56 hrs Surf.Area= 231 sf Storage= 122 cf

Plug-Flow detention time= 0.5 min calculated for 1.264 af (100% of inflow)  
 Center-of-Mass det. time= 0.5 min ( 1,254.3 - 1,253.8 )

| Volume | Invert  | Avail.Storage | Storage Description                                        |
|--------|---------|---------------|------------------------------------------------------------|
| #1     | 161.00' | 557 cf        | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |

| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 161.00              | 12                   | 0                         | 0                         |
| 162.00              | 207                  | 110                       | 110                       |
| 162.38              | 367                  | 109                       | 219                       |
| 163.00              | 726                  | 339                       | 557                       |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                  |
|--------|---------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 161.00' | <b>24.0" Round Culvert</b><br>L= 215.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 161.00' / 159.93' S= 0.0050 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |

**Primary OutFlow** Max=4.89 cfs @ 12.56 hrs HW=162.06' (Free Discharge)  
 1=Culvert (Barrel Controls 4.89 cfs @ 4.22 fps)

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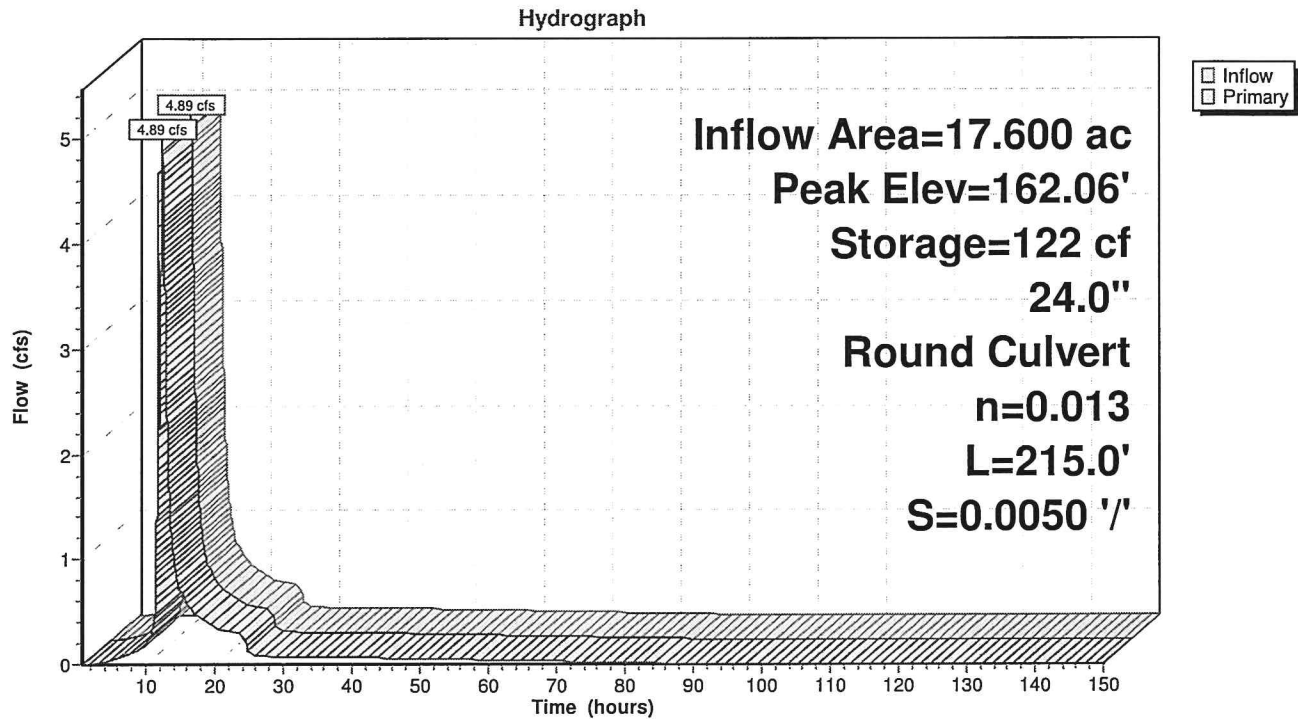
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**Pond 11: roadside ditch and north culvert**



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Type II 24-hr 1-yr Rainfall=2.1

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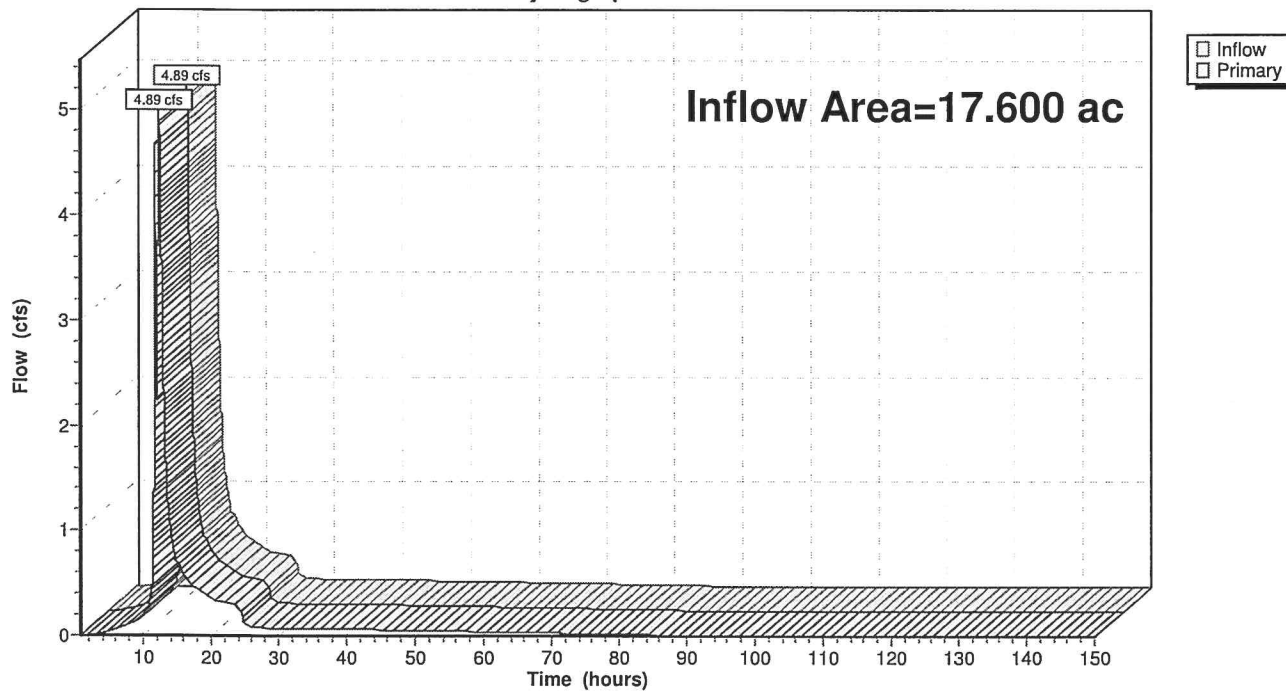
### Summary for Link 12: POI1

Inflow Area = 17.600 ac, 24.40% Impervious, Inflow Depth = 0.86" for 1-yr event  
Inflow = 4.89 cfs @ 12.56 hrs, Volume= 1.264 af  
Primary = 4.89 cfs @ 12.56 hrs, Volume= 1.264 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs

### Link 12: POI1

Hydrograph



# **10-Year Storm**

Pre-Development and Post Development

**Pre-Development**

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Type II 24-hr 10-yr Rainfall=3.20"

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**Summary for Subcatchment 25S: Watershed to corner of site**

Runoff = 15.30 cfs @ 12.52 hrs, Volume= 2.276 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-72.00 hrs, dt= 0.05 hrs  
Type II 24-hr 10-yr Rainfall=3.20"

| Area (sf) | CN | Description                   |
|-----------|----|-------------------------------|
| 159,343   | 77 | Woods, Good, HSG D            |
| * 7,453   | 77 | Woods, Good, HSG D            |
| 7,453     | 70 | Woods, Good, HSG C            |
| 183,487   | 80 | >75% Grass cover, Good, HSG D |
| 130,908   | 80 | >75% Grass cover, Good, HSG D |
| 130,908   | 74 | >75% Grass cover, Good, HSG C |
| 48,102    | 96 | Gravel surface, HSG D         |
| 91,908    | 98 | Paved parking, HSG D          |
| 759,562   | 81 | Weighted Average              |
| 667,654   |    | 87.90% Pervious Area          |
| 91,908    |    | 12.10% Impervious Area        |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                            |
|----------|---------------|---------------|-------------------|----------------|------------------------------------------------------------------------|
| 37.6     | 150           | 0.0670        | 0.07              |                | <b>Sheet Flow,</b><br>Woods: Dense underbrush n= 0.800 P2= 2.30"       |
| 3.9      | 140           | 0.0570        | 0.60              |                | <b>Shallow Concentrated Flow,</b><br>Forest w/Heavy Litter Kv= 2.5 fps |
| 10.1     | 630           | 0.0220        | 1.04              |                | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps   |
| 0.7      | 101           | 0.0200        | 2.28              |                | <b>Shallow Concentrated Flow,</b><br>Unpaved Kv= 16.1 fps              |
| 52.3     | 1,021         | Total         |                   |                |                                                                        |

**Pre-Development**

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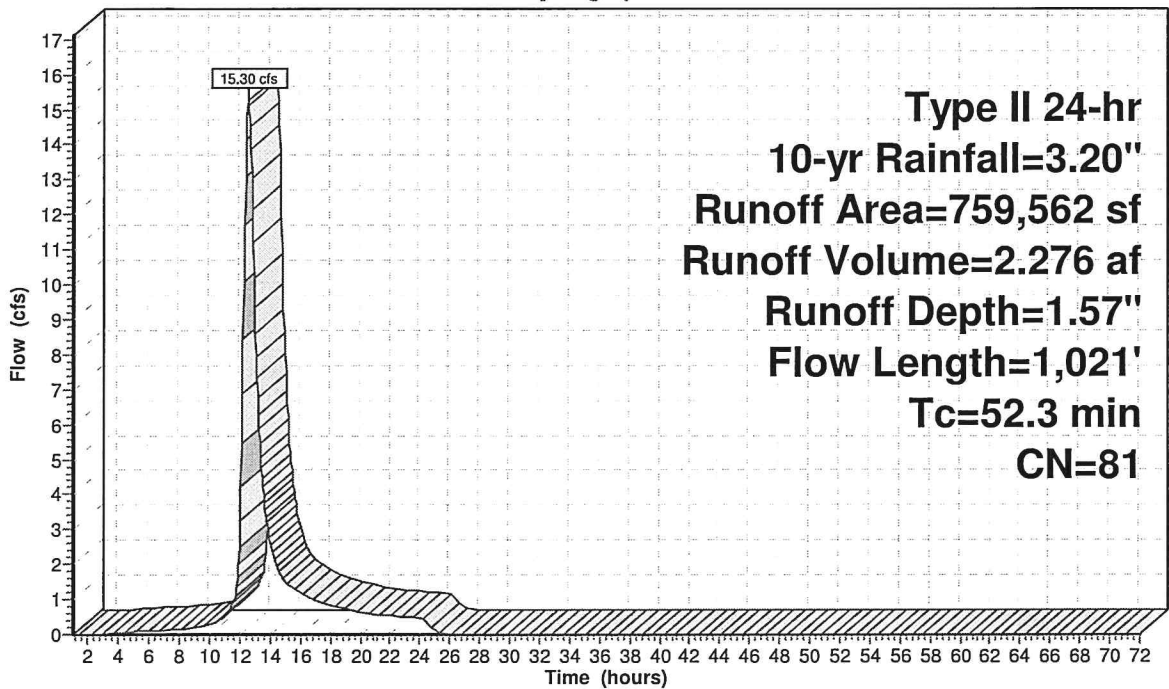
Rhino Foods  
Type II 24-hr 10-yr Rainfall=3.20"

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**Subcatchment 25S: Watershed to corner of site**

Hydrograph



## Pre-Development

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Rhino Food  
Type II 24-hr 10-yr Rainfall=3.2

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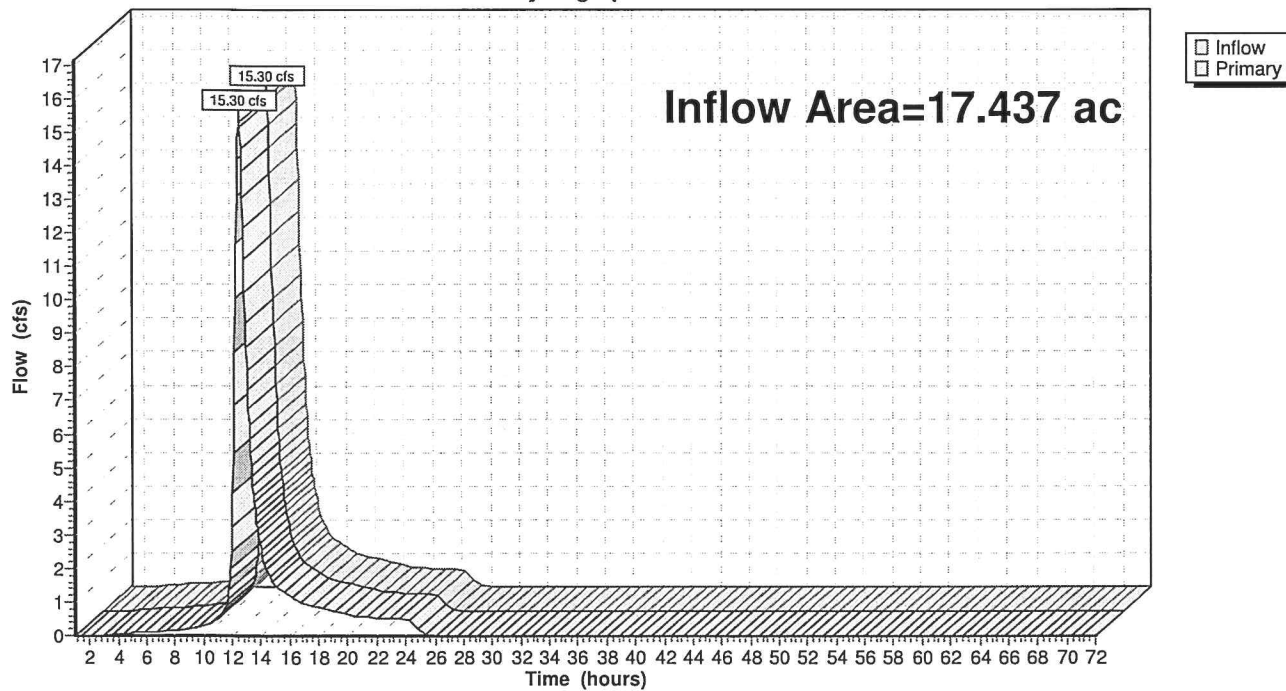
### Summary for Link 26L: POI 1

Inflow Area = 17.437 ac, 12.10% Impervious, Inflow Depth = 1.57" for 10-yr event  
Inflow = 15.30 cfs @ 12.52 hrs, Volume= 2.276 af  
Primary = 15.30 cfs @ 12.52 hrs, Volume= 2.276 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.05 hrs

### Link 26L: POI 1

Hydrograph





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Type II 24-hr 10-yr Rainfall=3.20"

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**Summary for Subcatchment 1b: To TS#1-1,10,25**

Runoff = 3.47 cfs @ 12.26 hrs, Volume= 0.365 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr 10-yr Rainfall=3.20"

|   | Area (sf) | CN | Description                            |
|---|-----------|----|----------------------------------------|
| * | 2,200     | 98 | EXTRA IMPERVIOUS                       |
| * | 27,016    | 98 | Pavement                               |
|   | 13,842    | 80 | >75% Grass cover, Good, HSG D          |
|   | 7,883     | 74 | >75% Grass cover, Good, HSG C          |
|   | 7,883     | 80 | >75% Grass cover, Good, HSG D          |
| * | 5,380     | 98 | Off-site Roof                          |
| * | 4,407     | 98 | off-site roof                          |
| * | 23,203    | 77 | off-site Woods, Good, HSG D            |
|   | 7,452     | 70 | off-site Woods, Good, HSG C            |
|   | 887       | 80 | off-site >75% Grass cover, Good, HSG D |
|   | 888       | 74 | off-site >75% Grass cover, Good, HSG C |
|   | 101,041   | 85 | Weighted Average                       |
|   | 62,038    |    | 61.40% Pervious Area                   |
|   | 39,003    |    | 38.60% Impervious Area                 |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                            |
|-------------|------------------|------------------|----------------------|-------------------|------------------------------------------------------------------------|
| 23.2        | 100              | 0.1000           | 0.07                 |                   | <b>Sheet Flow,</b><br>Woods: Dense underbrush n= 0.800 P2= 2.30"       |
| 4.4         | 120              | 0.0333           | 0.46                 |                   | <b>Shallow Concentrated Flow,</b><br>Forest w/Heavy Litter Kv= 2.5 fps |
| 3.3         | 300              | 0.0100           | 1.50                 |                   | <b>Shallow Concentrated Flow,</b><br>Grassed Waterway Kv= 15.0 fps     |
| 30.9        | 520              | Total            |                      |                   |                                                                        |

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Rhino Food

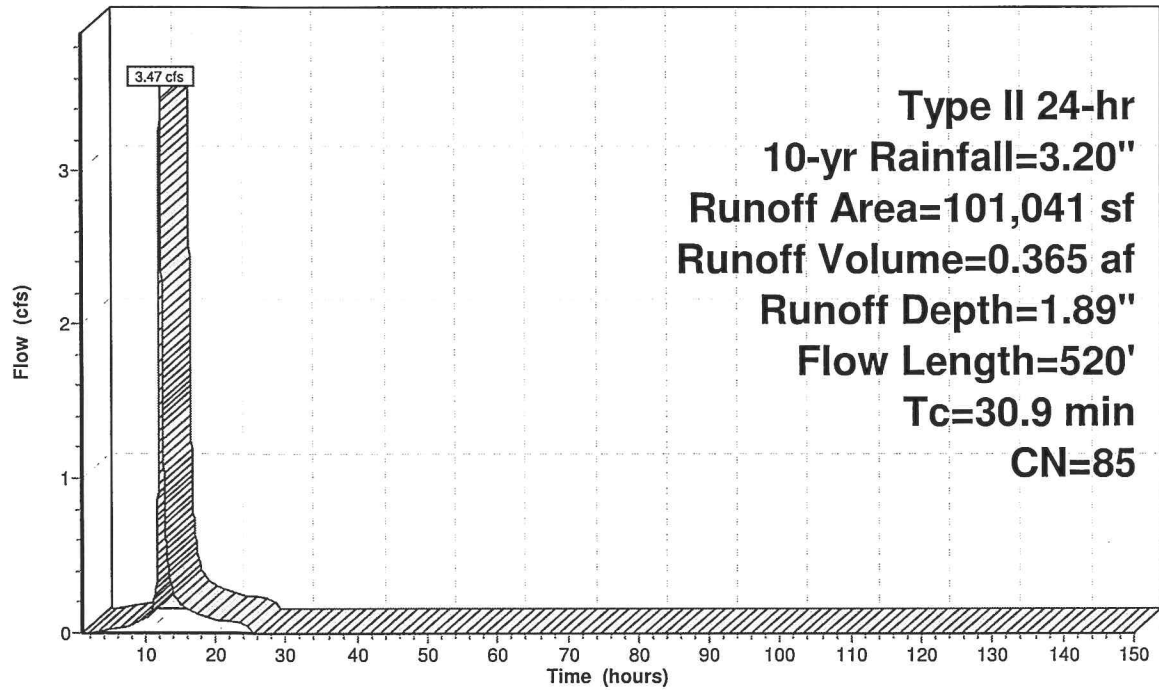
Type II 24-hr 10-yr Rainfall=3.20"

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Subcatchment 1b: To TS#1-1,10,25

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.20"

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### Summary for Subcatchment 3: Site Area to forebay

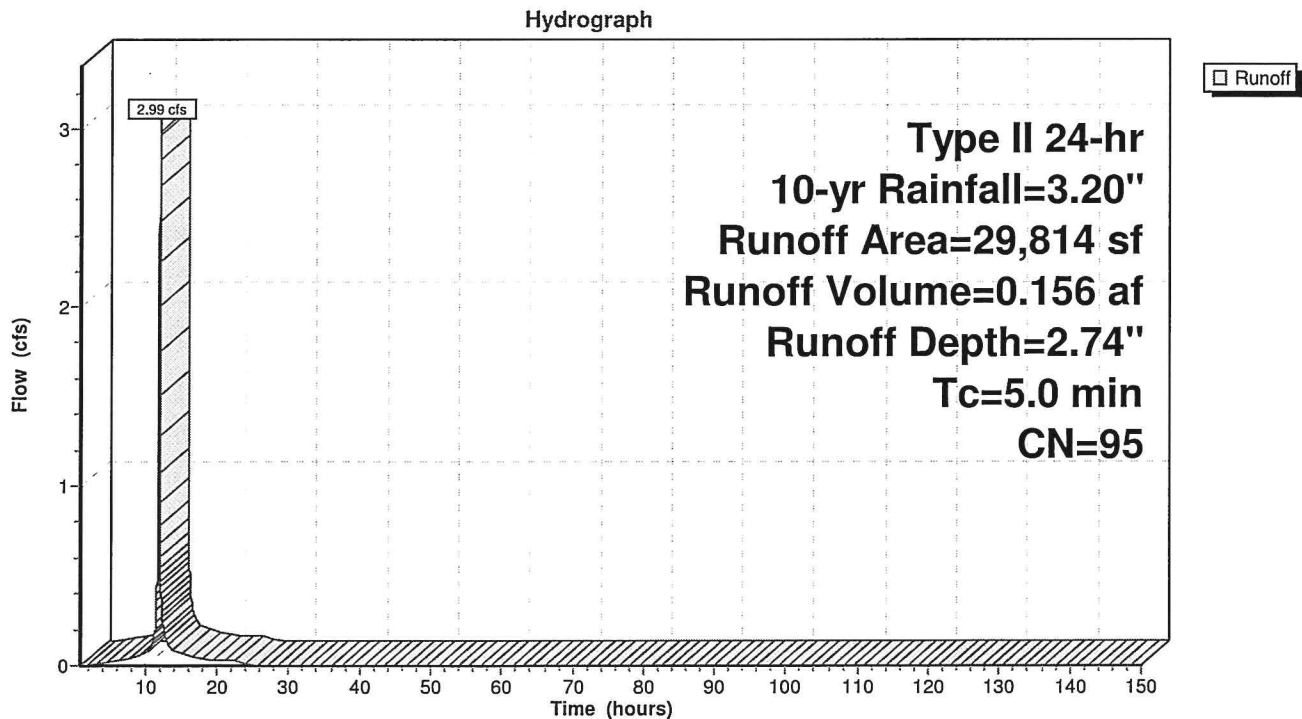
Runoff = 2.99 cfs @ 11.96 hrs, Volume= 0.156 af, Depth= 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr 10-yr Rainfall=3.20"

|   | Area (sf) | CN | Description                   |
|---|-----------|----|-------------------------------|
| * | 25,509    | 98 | Paved parking and roof        |
|   | 4,305     | 80 | >75% Grass cover, Good, HSG D |
|   | 29,814    | 95 | Weighted Average              |
|   | 4,305     |    | 14.44% Pervious Area          |
|   | 25,509    |    | 85.56% Impervious Area        |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description   |
|-------------|------------------|------------------|----------------------|-------------------|---------------|
| 5.0         |                  |                  |                      |                   | Direct Entry, |

### Subcatchment 3: Site Area to forebay



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Rhino Food  
Type II 24-hr 10-yr Rainfall=3.20"

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**Summary for Subcatchment 4: Directly to main cell**

Runoff = 1.03 cfs @ 11.91 hrs, Volume= 0.044 af, Depth= 1.89"

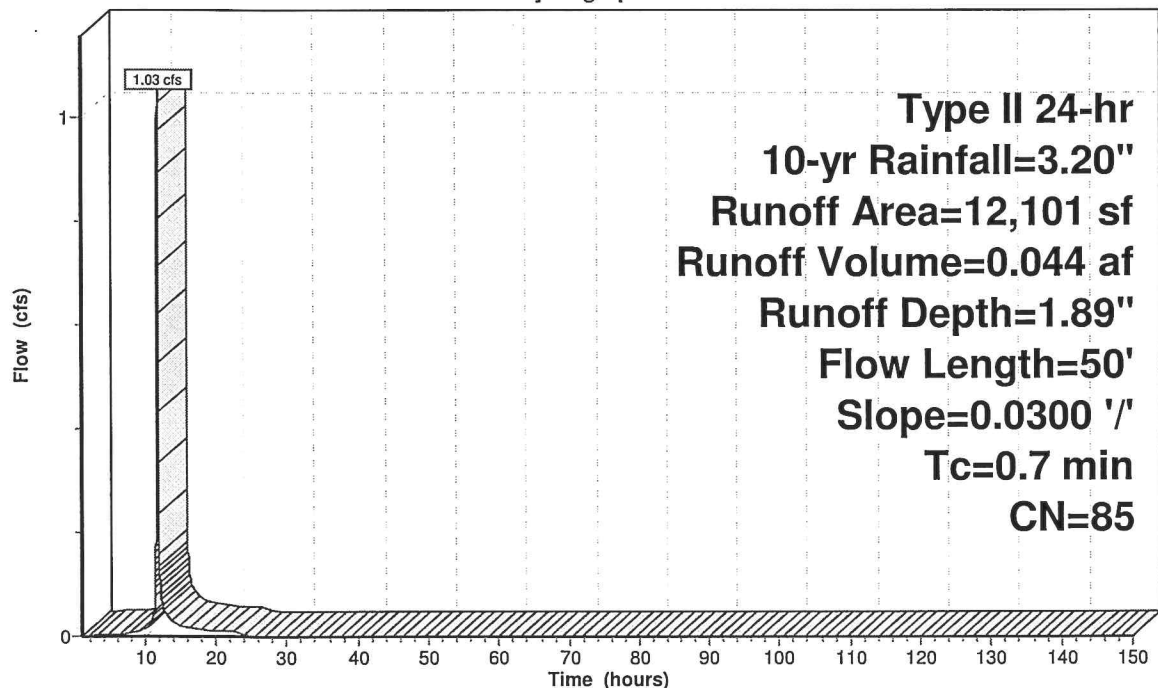
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr 10-yr Rainfall=3.20"

| Area (sf) | CN | Description                   |
|-----------|----|-------------------------------|
| * 4,267   | 98 | Paved and Roof                |
| 3,742     | 80 | >75% Grass cover, Good, HSG D |
| 2,046     | 80 | >75% Grass cover, Good, HSG D |
| 2,046     | 74 | >75% Grass cover, Good, HSG C |
| 12,101    | 85 | Weighted Average              |
| 7,834     |    | 64.74% Pervious Area          |
| 4,267     |    | 35.26% Impervious Area        |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                       |
|----------|---------------|---------------|-------------------|----------------|---------------------------------------------------|
| 0.7      | 50            | 0.0300        | 1.19              |                | Sheet Flow,<br>Smooth surfaces n= 0.011 P2= 2.30" |

**Subcatchment 4: Directly to main cell**

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.20"

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**Summary for Subcatchment 6: On-Site Area to south culvert**

Runoff = 0.19 cfs @ 12.50 hrs, Volume= 0.029 af, Depth= 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr 10-yr Rainfall=3.20"

| Area (sf) | CN | Description                   |
|-----------|----|-------------------------------|
| 2,040     | 74 | >75% Grass cover, Good, HSG C |
| 2,040     | 80 | >75% Grass cover, Good, HSG D |
| 1,250     | 80 | >75% Grass cover, Good, HSG D |
| 2,801     | 98 | Paved parking, HSG D          |
| 8,131     | 85 | Weighted Average              |
| 5,330     |    | 65.55% Pervious Area          |
| 2,801     |    | 34.45% Impervious Area        |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                            |
|----------|---------------|---------------|-------------------|----------------|------------------------------------------------------------------------|
| 37.6     | 150           | 0.0670        | 0.07              |                | <b>Sheet Flow,</b><br>Woods: Dense underbrush n= 0.800 P2= 2.30"       |
| 3.9      | 140           | 0.0570        | 0.60              |                | <b>Shallow Concentrated Flow,</b><br>Forest w/Heavy Litter Kv= 2.5 fps |
| 10.1     | 630           | 0.0220        | 1.04              |                | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps   |
| 0.7      | 101           | 0.0200        | 2.28              |                | <b>Shallow Concentrated Flow,</b><br>Unpaved Kv= 16.1 fps              |
| 52.3     | 1,021         | Total         |                   |                |                                                                        |

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Rhino Foot

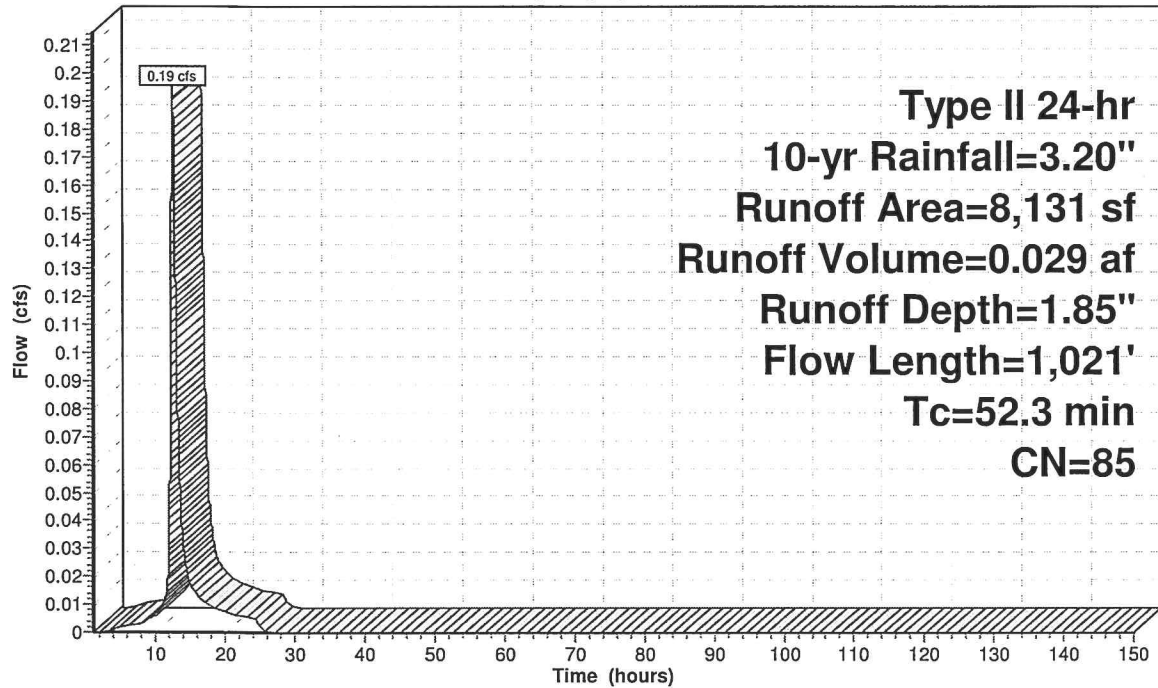
Type II 24-hr 10-yr Rainfall=3.20"

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### Subcatchment 6: On-Site Area to south culvert

Hydrograph



Runoff

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Rhino Foods  
Type II 24-hr 10-yr Rainfall=3.20"

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**Summary for Subcatchment 7: Off-Site Area to south culvert**

Runoff = 10.15 cfs @ 12.54 hrs, Volume= 1.512 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr 10-yr Rainfall=3.20"

| Area (sf) | CN | Description                   |
|-----------|----|-------------------------------|
| 143,594   | 77 | Woods, Good, HSG D            |
| 0         | 70 | Woods, Good, HSG C            |
| 103,187   | 74 | >75% Grass cover, Good, HSG C |
| 103,187   | 80 | >75% Grass cover, Good, HSG D |
| 125,044   | 80 | >75% Grass cover, Good, HSG D |
| * 63,788  | 98 | Paved or roof                 |
| 538,800   | 80 | Weighted Average              |
| 475,012   |    | 88.16% Pervious Area          |
| 63,788    |    | 11.84% Impervious Area        |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                            |
|----------|---------------|---------------|-------------------|----------------|------------------------------------------------------------------------|
| 37.6     | 150           | 0.0670        | 0.07              |                | <b>Sheet Flow,</b><br>Woods: Dense underbrush n= 0.800 P2= 2.30"       |
| 3.9      | 140           | 0.0570        | 0.60              |                | <b>Shallow Concentrated Flow,</b><br>Forest w/Heavy Litter Kv= 2.5 fps |
| 10.1     | 630           | 0.0220        | 1.04              |                | <b>Shallow Concentrated Flow,</b><br>Short Grass Pasture Kv= 7.0 fps   |
| 0.7      | 101           | 0.0200        | 2.28              |                | <b>Shallow Concentrated Flow,</b><br>Unpaved Kv= 16.1 fps              |
| 52.3     | 1,021         | Total         |                   |                |                                                                        |



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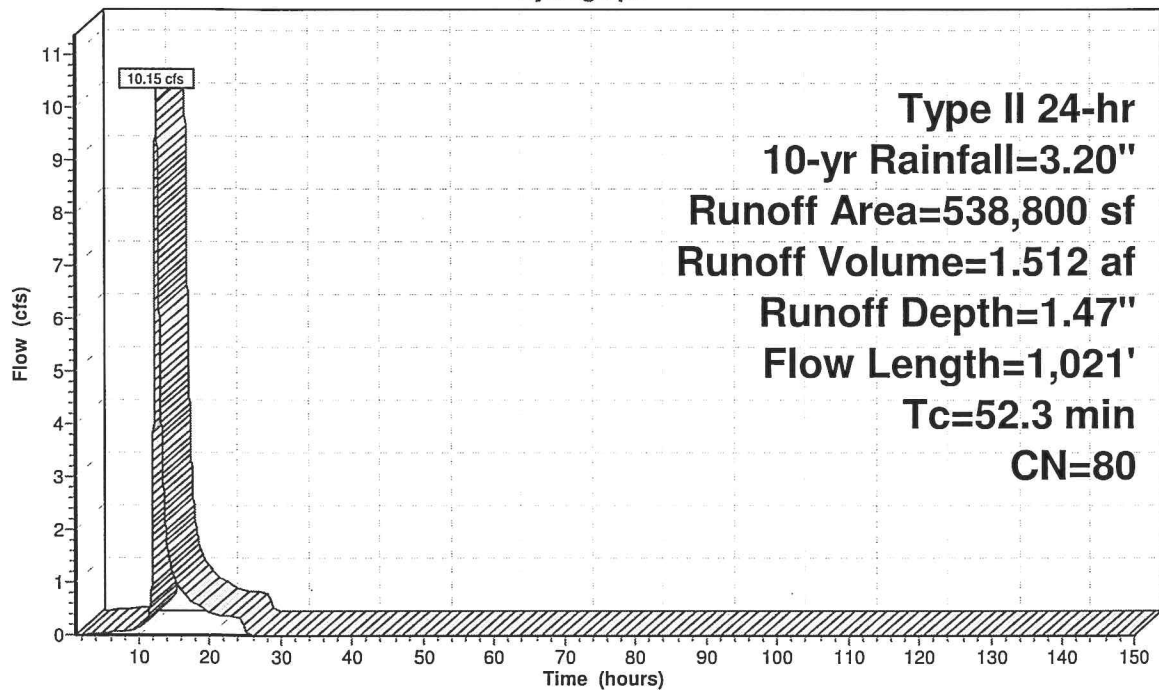
Rhino Foot  
Type II 24-hr 10-yr Rainfall=3.20

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### Subcatchment 7: Off-Site Area to south culvert

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.20"

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### Summary for Subcatchment 9: Site Area to north culvert

Runoff = 3.92 cfs @ 11.96 hrs, Volume= 0.205 af, Depth= 2.67"

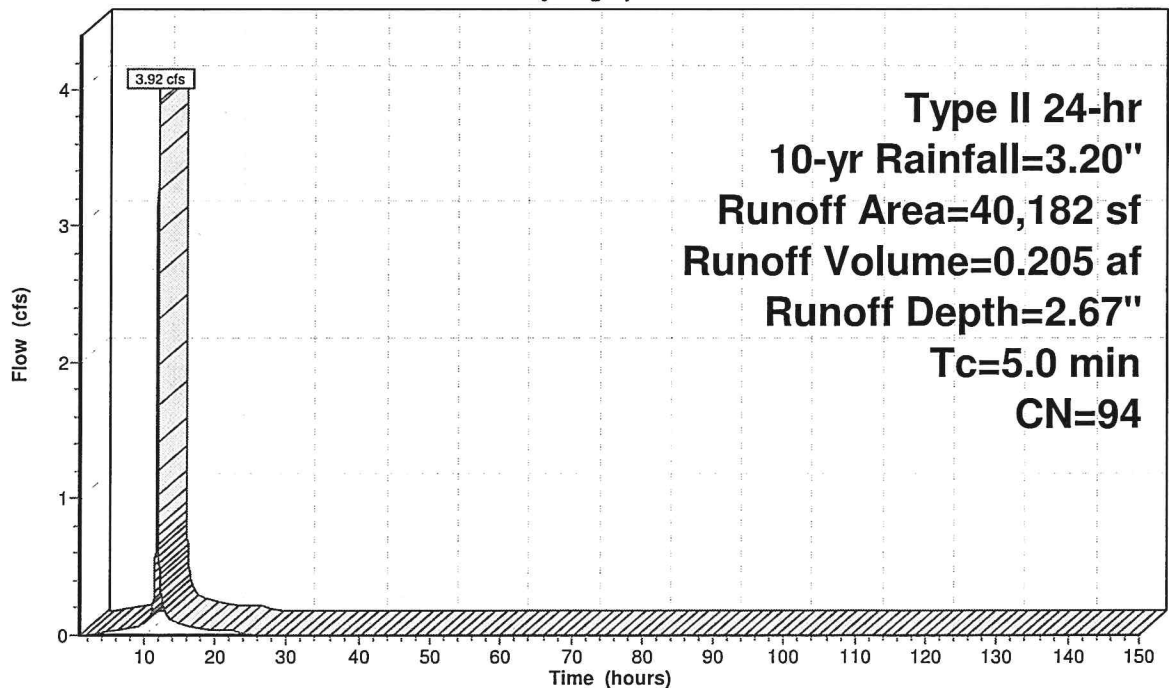
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr 10-yr Rainfall=3.20"

|   | Area (sf) | CN | Description                   |
|---|-----------|----|-------------------------------|
| * | 33,171    | 98 | Impervious                    |
|   | 3,033     | 80 | >75% Grass cover, Good, HSG D |
|   | 3,033     | 74 | >75% Grass cover, Good, HSG C |
|   | 945       | 80 | >75% Grass cover, Good, HSG D |
|   | 40,182    | 94 | Weighted Average              |
|   | 7,011     |    | 17.45% Pervious Area          |
|   | 33,171    |    | 82.55% Impervious Area        |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description   |
|-------------|------------------|------------------|----------------------|-------------------|---------------|
| 5.0         |                  |                  |                      |                   | Direct Entry, |

### Subcatchment 9: Site Area to north culvert

Hydrograph



Runoff

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Type II 24-hr 10-yr Rainfall=3.20"

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Page 1

**Summary for Subcatchment 10: Off-Site Area to north culvert**

Runoff = 2.96 cfs @ 11.96 hrs, Volume= 0.149 af, Depth= 2.13"

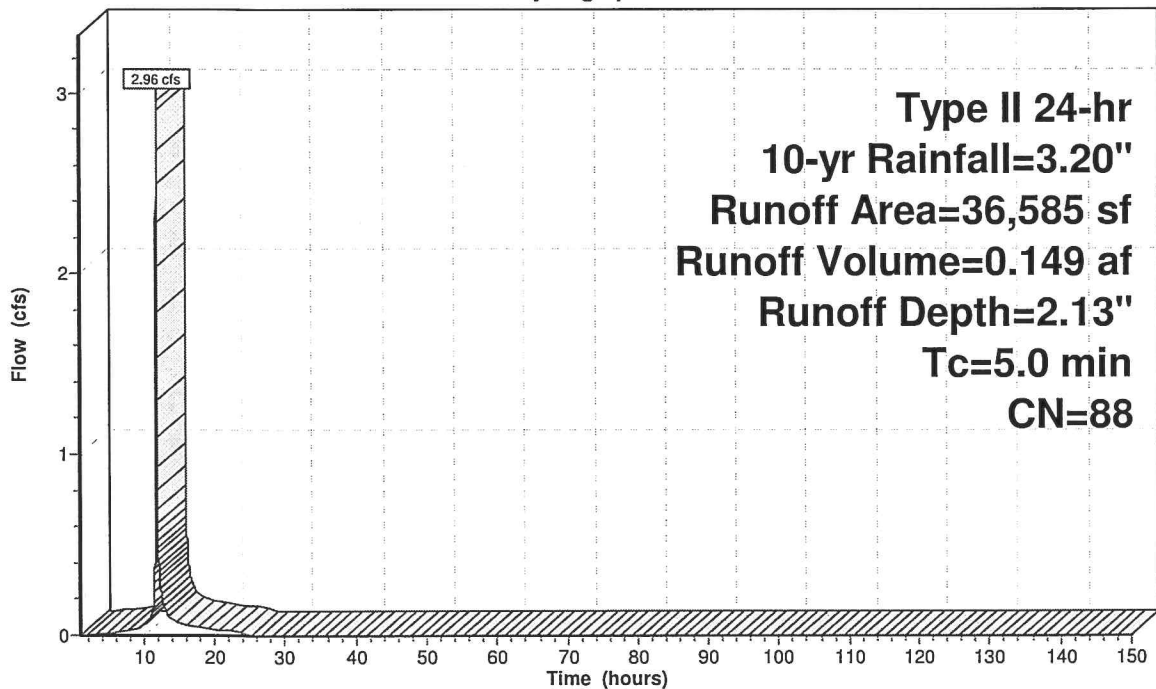
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
Type II 24-hr 10-yr Rainfall=3.20"

| Area (sf) | CN | Description                   |
|-----------|----|-------------------------------|
| 6,327     | 74 | >75% Grass cover, Good, HSG C |
| 11,732    | 80 | >75% Grass cover, Good, HSG D |
| * 18,526  | 98 | Paved or roof                 |
| 36,585    | 88 | Weighted Average              |
| 18,059    |    | 49.36% Pervious Area          |
| 18,526    |    | 50.64% Impervious Area        |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description   |
|----------|---------------|---------------|-------------------|----------------|---------------|
| 5.0      |               |               |                   |                | Direct Entry, |

**Subcatchment 10: Off-Site Area to north culvert**

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.20"

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### Summary for Reach 2c: Treatment Swale #1-10 yr

Inflow Area = 2.320 ac, 38.60% Impervious, Inflow Depth = 1.89" for 10-yr event  
Inflow = 3.47 cfs @ 12.26 hrs, Volume= 0.365 af  
Outflow = 2.95 cfs @ 12.58 hrs, Volume= 0.365 af, Atten= 15%, Lag= 19.2 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs

Max. Velocity= 0.83 fps, Min. Travel Time= 11.5 min

Avg. Velocity = 0.20 fps, Avg. Travel Time= 47.9 min

Peak Storage= 2,042 cf @ 12.38 hrs

Average Depth at Peak Storage= 0.70'

Bank-Full Depth= 1.25' Flow Area= 8.4 sf, Capacity= 9.64 cfs

3.00' x 1.25' deep channel, n= 0.086

Side Slope Z-value= 3.0 '/' Top Width= 10.50'

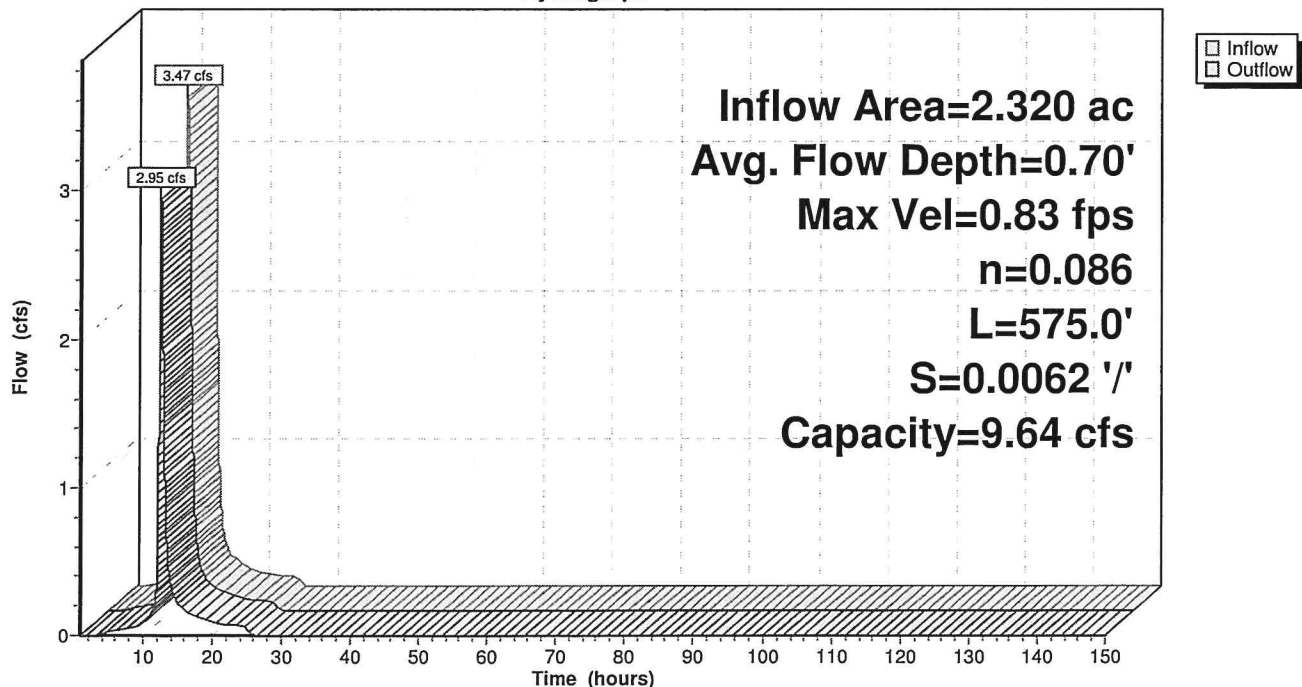
Length= 575.0' Slope= 0.0062 '/'

Inlet Invert= 170.46', Outlet Invert= 166.92'



### Reach 2c: Treatment Swale #1-10 yr

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.2

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**Summary for Pond 5: Forebay and Main Cell**

Inflow Area = 3.282 ac, 48.11% Impervious, Inflow Depth = 2.07" for 10-yr event  
 Inflow = 3.99 cfs @ 11.94 hrs, Volume= 0.565 af  
 Outflow = 2.00 cfs @ 12.90 hrs, Volume= 0.565 af, Atten= 50%, Lag= 57.7 min  
 Primary = 2.00 cfs @ 12.90 hrs, Volume= 0.565 af

Routing by Stor-Ind method, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs

Starting Elev= 164.17' Surf.Area= 4,526 sf Storage= 6,663 cf

Peak Elev= 166.21' @ 12.90 hrs Surf.Area= 7,094 sf Storage= 18,498 cf (11,835 cf above start)

Flood Elev= 166.80' Surf.Area= 7,871 sf Storage= 22,889 cf (16,226 cf above start)

Plug-Flow detention time= 1,458.3 min calculated for 0.412 af (73% of inflow)

Center-of-Mass det. time= 975.0 min ( 1,793.0 - 818.0 )

| Volume | Invert  | Avail.Storage | Storage Description                                        |
|--------|---------|---------------|------------------------------------------------------------|
| #1     | 160.17' | 22,889 cf     | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |

| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 160.17              | 66                   | 0                         | 0                         |
| 161.00              | 196                  | 109                       | 109                       |
| 162.00              | 383                  | 290                       | 398                       |
| 162.80              | 2,872                | 1,302                     | 1,700                     |
| 163.80              | 3,926                | 3,399                     | 5,099                     |
| 164.17              | 4,526                | 1,564                     | 6,663                     |
| 165.00              | 5,539                | 4,177                     | 10,840                    |
| 166.00              | 6,812                | 6,176                     | 17,015                    |
| 166.80              | 7,871                | 5,873                     | 22,889                    |

| Device | Routing  | Invert  | Outlet Devices                                                                                                                                                                                                   |
|--------|----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary  | 164.17' | <b>24.0" Round Culvert</b><br>L= 28.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 164.17' / 164.03' S= 0.0050 ' / ' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |
| #2     | Device 1 | 164.17' | <b>1.5" Vert. Orifice/Grate</b> C= 0.600                                                                                                                                                                         |
| #3     | Device 1 | 166.00' | <b>6.0' long x 0.25' rise Sharp-Crested Rectangular Weir</b><br>2 End Contraction(s)                                                                                                                             |

**Primary OutFlow** Max=2.00 cfs @ 12.90 hrs HW=166.21' (Free Discharge)

1=Culvert (Passes 2.00 cfs of 12.57 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.08 cfs @ 6.78 fps)

3=Sharp-Crested Rectangular Weir (Weir Controls 1.92 cfs @ 1.51 fps)

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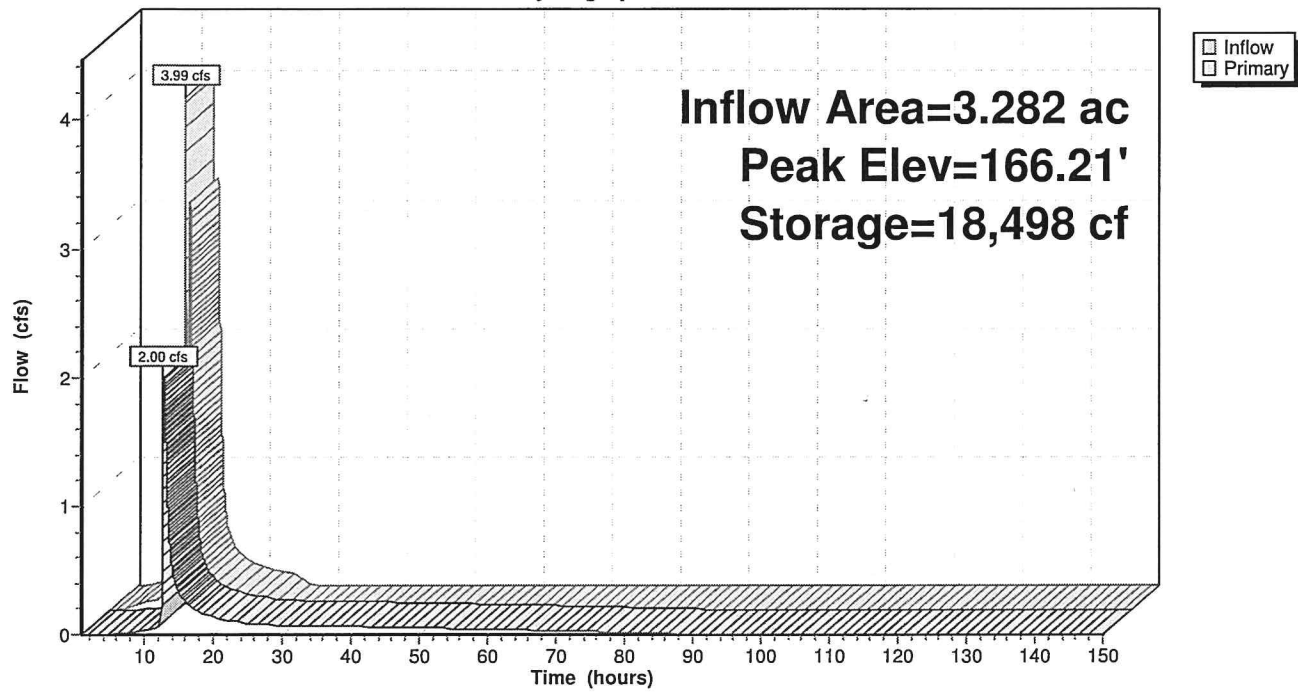
Rhino Foods  
Type II 24-hr 10-yr Rainfall=3.20'

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### Pond 5: Forebay and Main Cell

Hydrograph



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**Summary for Pond 8: roadside ditch and south culvert**

Inflow Area = 15.838 ac, 19.62% Impervious, Inflow Depth = 1.60" for 10-yr event  
 Inflow = 10.57 cfs @ 12.71 hrs, Volume= 2.106 af  
 Outflow = 10.50 cfs @ 12.74 hrs, Volume= 2.106 af, Atten= 1%, Lag= 1.7 min  
 Primary = 10.50 cfs @ 12.74 hrs, Volume= 2.106 af

Routing by Stor-Ind method, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
 Peak Elev= 165.76' @ 12.74 hrs Surf.Area= 1,698 sf Storage= 927 cf  
 Flood Elev= 166.40' Surf.Area= 2,150 sf Storage= 2,252 cf

Plug-Flow detention time= 0.5 min calculated for 2.106 af (100% of inflow)  
 Center-of-Mass det. time= 0.5 min ( 1,115.0 - 1,114.5 )

| Volume | Invert  | Avail.Storage | Storage Description                                        |
|--------|---------|---------------|------------------------------------------------------------|
| #1     | 163.75' | 2,273 cf      | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |

| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 163.75              | 1                    | 0                         | 0                         |
| 164.00              | 5                    | 1                         | 1                         |
| 165.00              | 320                  | 163                       | 163                       |
| 166.00              | 2,141                | 1,231                     | 1,394                     |
| 166.41              | 2,150                | 880                       | 2,273                     |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                              |
|--------|---------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 163.60' | <b>24.0" Round Culvert</b><br>L= 68.0' CMP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 163.60' / 163.55' S= 0.0007 ' S= 0.0007 ' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |

**Primary OutFlow** Max=10.50 cfs @ 12.74 hrs HW=165.76' (Free Discharge)

1=Culvert (Barrel Controls 10.50 cfs @ 3.86 fps)



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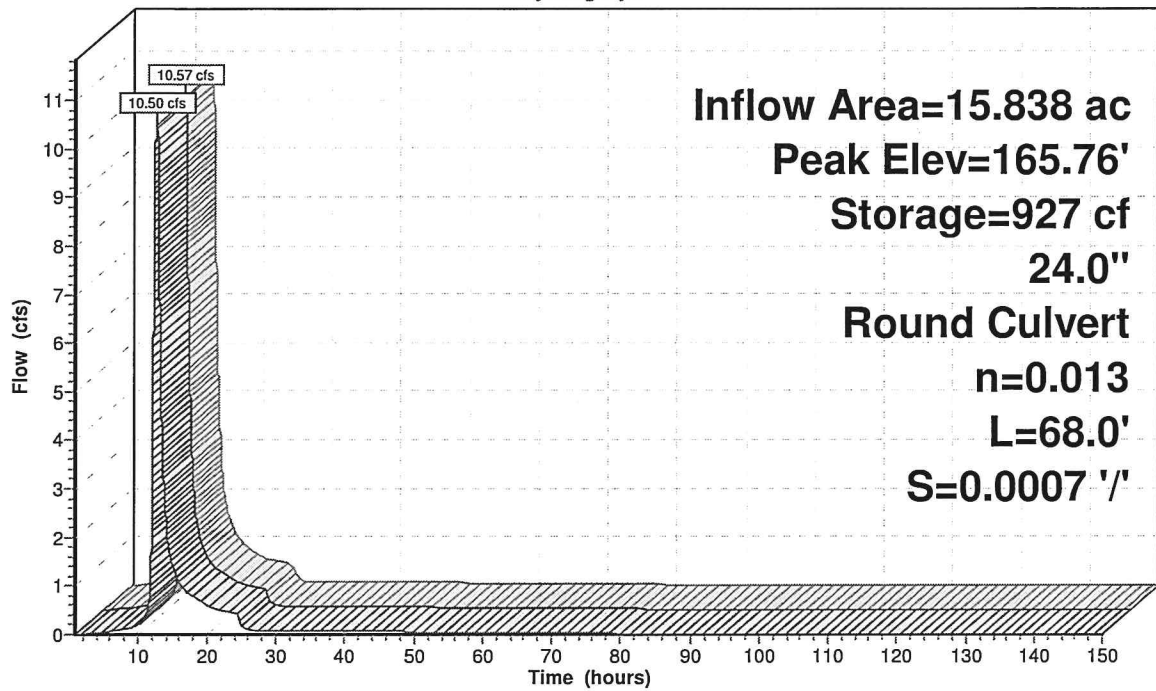
Rhino Foods  
Type II 24-hr 10-yr Rainfall=3.20"

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**Pond 8: roadside ditch and south culvert**

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.2

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**Summary for Pond 11: roadside ditch and north culvert**

Inflow Area = 17.600 ac, 24.40% Impervious, Inflow Depth = 1.68" for 10-yr event  
 Inflow = 10.89 cfs @ 12.74 hrs, Volume= 2.460 af  
 Outflow = 10.88 cfs @ 12.75 hrs, Volume= 2.460 af, Atten= 0%, Lag= 0.8 min  
 Primary = 10.88 cfs @ 12.75 hrs, Volume= 2.460 af

Routing by Stor-Ind method, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs  
 Peak Elev= 162.72' @ 12.75 hrs Surf.Area= 562 sf Storage= 375 cf

Plug-Flow detention time= 0.5 min calculated for 2.460 af (100% of inflow)  
 Center-of-Mass det. time= 0.5 min ( 1,065.5 - 1,065.0 )

| Volume | Invert  | Avail.Storage | Storage Description                                        |
|--------|---------|---------------|------------------------------------------------------------|
| #1     | 161.00' | 557 cf        | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |

| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 161.00              | 12                   | 0                         | 0                         |
| 162.00              | 207                  | 110                       | 110                       |
| 162.38              | 367                  | 109                       | 219                       |
| 163.00              | 726                  | 339                       | 557                       |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                                  |
|--------|---------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 161.00' | <b>24.0" Round Culvert</b><br>L= 215.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 161.00' / 159.93' S= 0.0050 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |

**Primary OutFlow** Max=10.88 cfs @ 12.75 hrs HW=162.72' (Free Discharge)

**1=Culvert** (Barrel Controls 10.88 cfs @ 5.09 fps)

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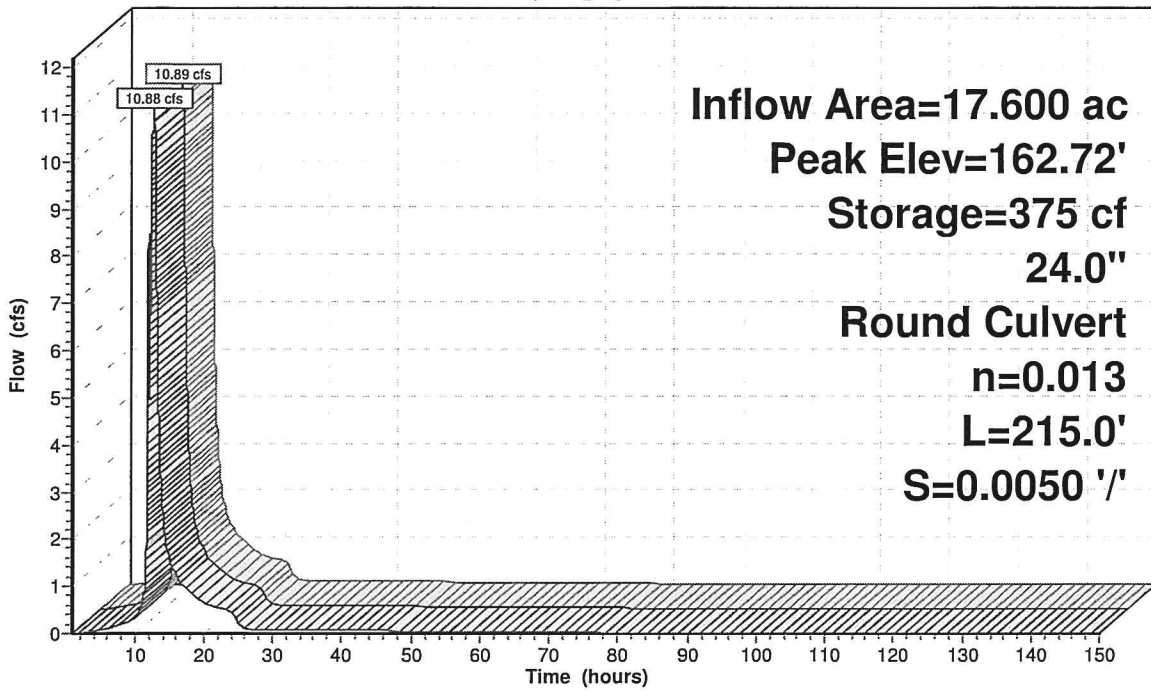
Rhino Foods  
Type II 24-hr 10-yr Rainfall=3.20"

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### Pond 11: roadside ditch and north culvert

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.2

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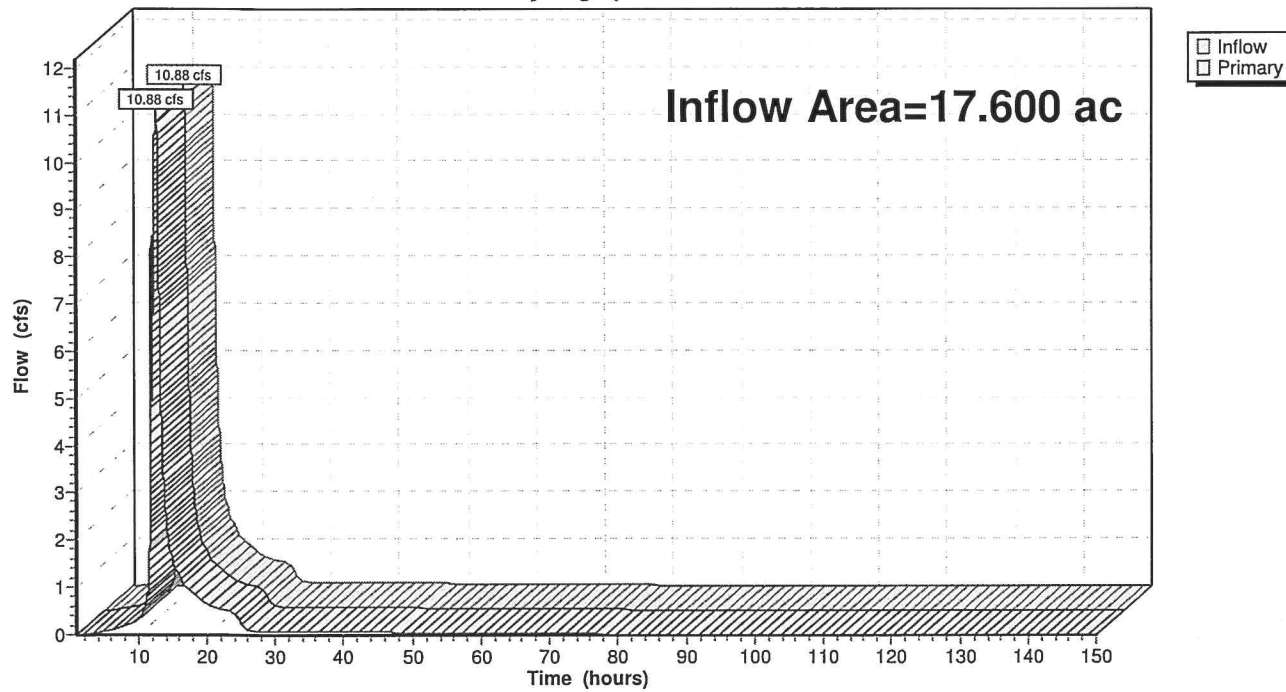
### Summary for Link 12: POI1

Inflow Area = 17.600 ac, 24.40% Impervious, Inflow Depth = 1.68" for 10-yr event  
Inflow = 10.88 cfs @ 12.75 hrs, Volume= 2.460 af  
Primary = 10.88 cfs @ 12.75 hrs, Volume= 2.460 af, Atten= 0%, Lag= 0.0 min

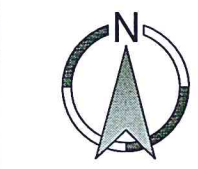
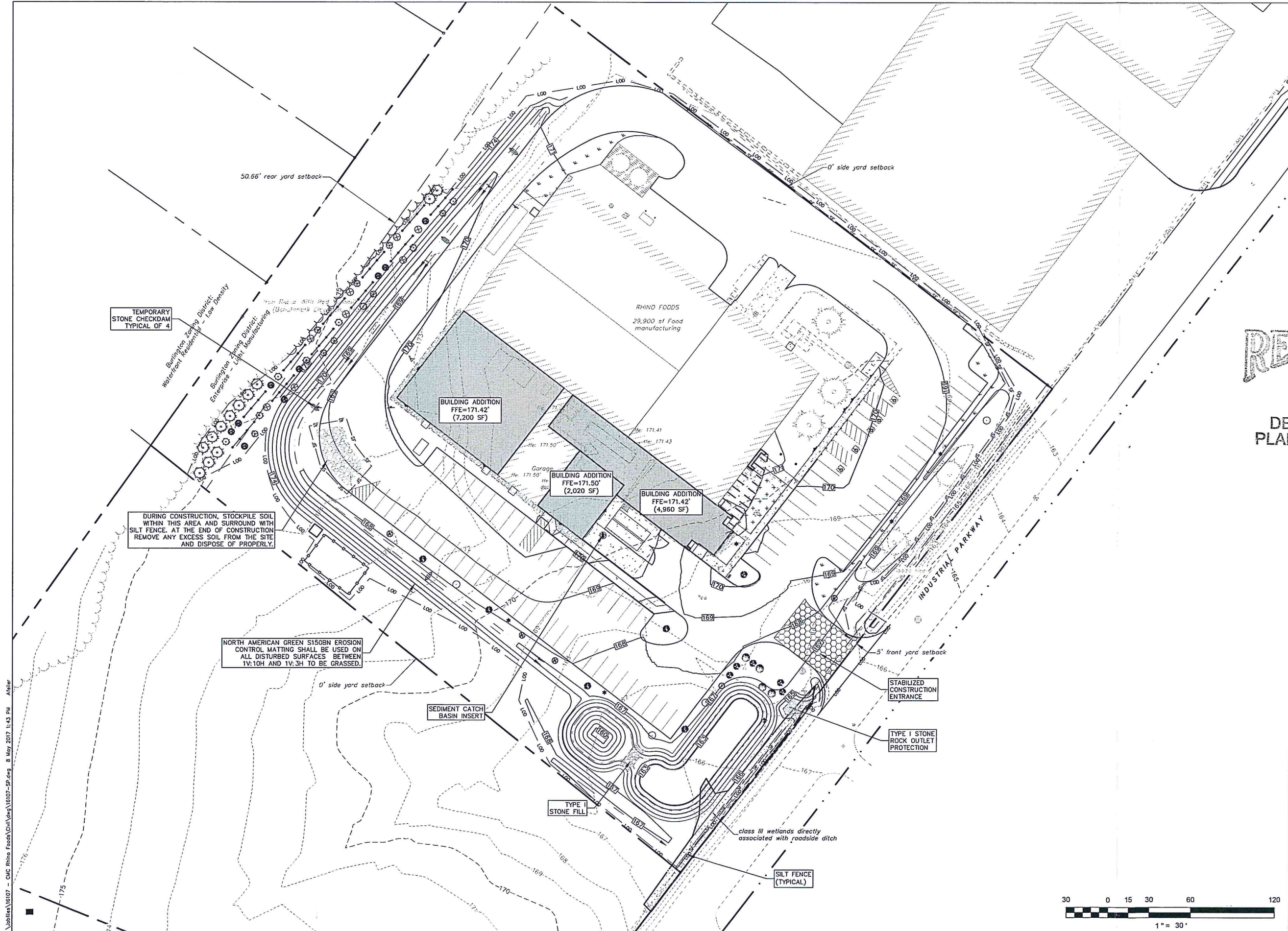
Primary outflow = Inflow, Time Span= 1.00-150.00 hrs, dt= 0.01 hrs

### Link 12: POI1

Hydrograph







Civil & Structural Engineers  
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PHONE: 802.255.1234 FAX: 802.255.1235

| no. | date | revision |
|-----|------|----------|
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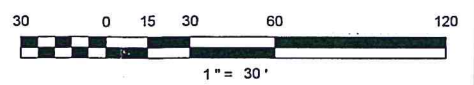
project name:  
**RHINO FOODS  
BUILDING ADDITION**  
project location:  
79 INDUSTRIAL PARKWAY  
BURLINGTON, VERMONT  
client:  
CMC DESIGN-BUILD, INC.

project number: 16107  
drawn by: AAF  
checked by: JUS  
scale: 1"=30'  
date: 3 MAY 2017  
released for: PERMITTING

sheet description:  
**EROSION  
CONTROL PLAN**

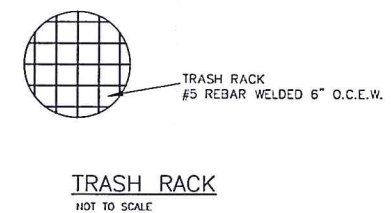
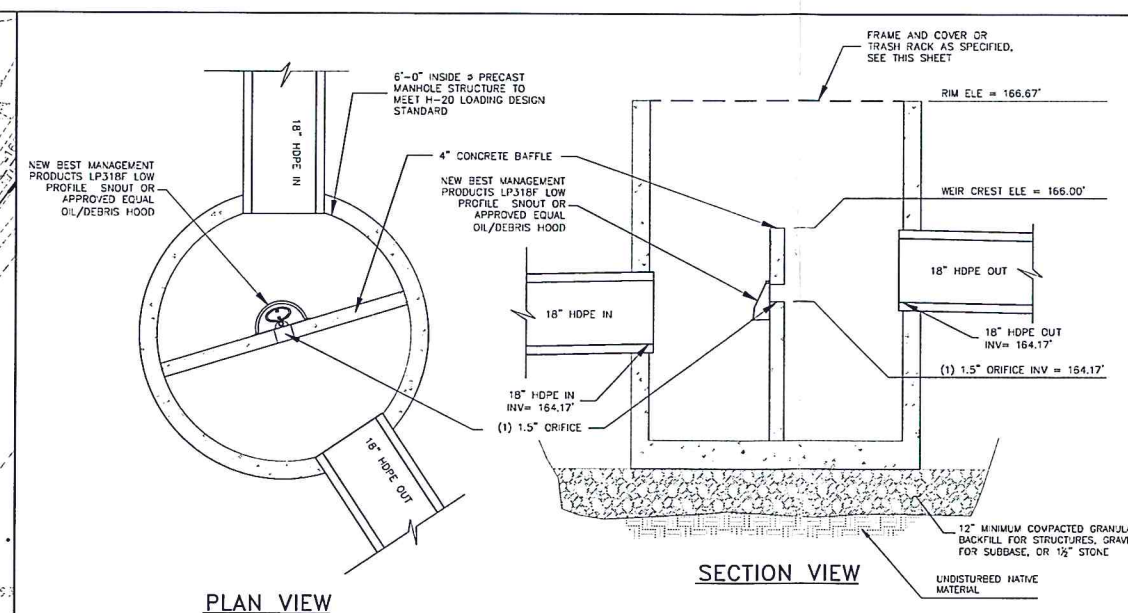
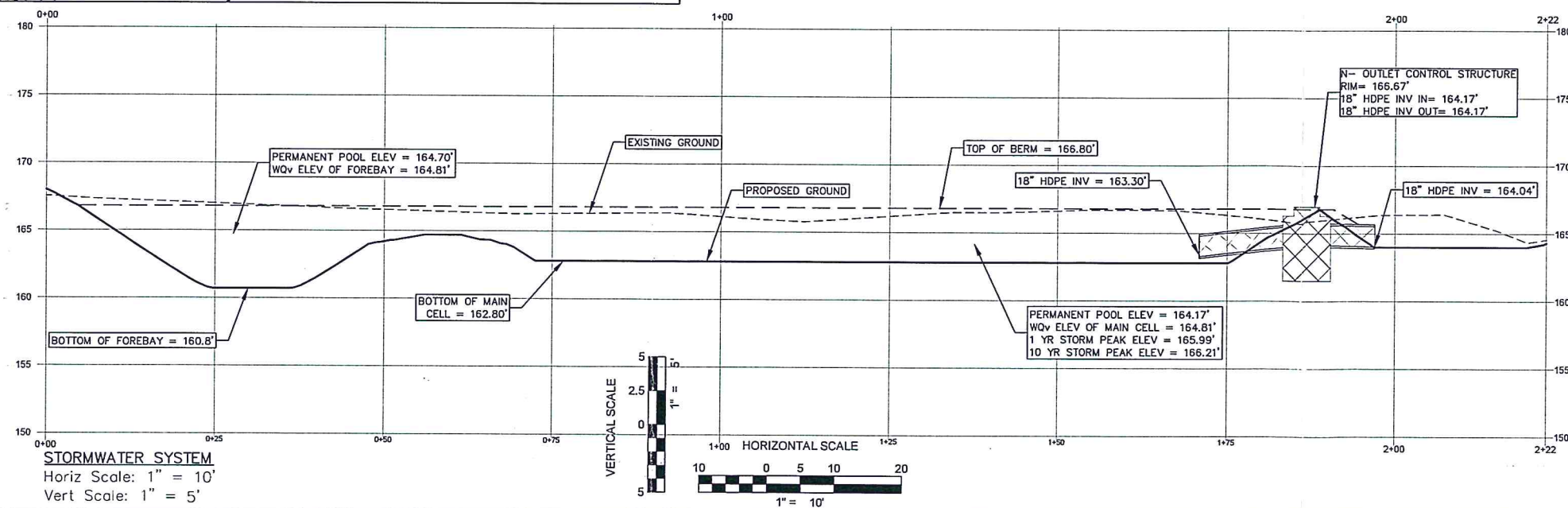
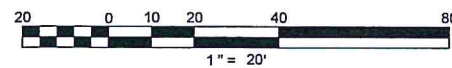
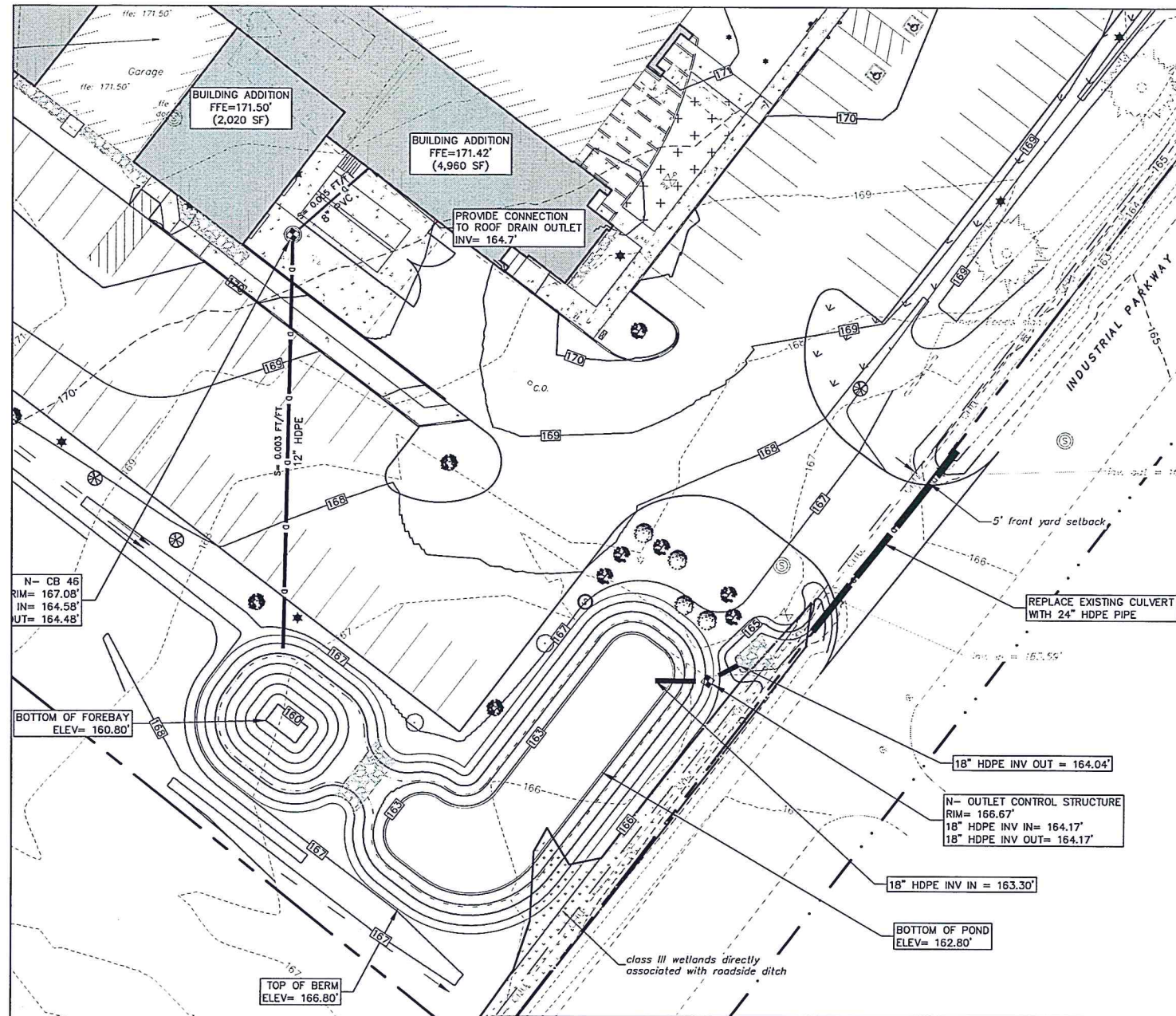
**C1.05**

SHEET 7 OF 12





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| no. | date        | revision |
|-----|-------------|----------|
| 1   | MAY 09 2017 |          |

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project name:  
**RHINO FOODS  
BUILDING ADDITION**

project location:  
**79 INDUSTRIAL PARKWAY  
BURLINGTON, VERMONT**

client:  
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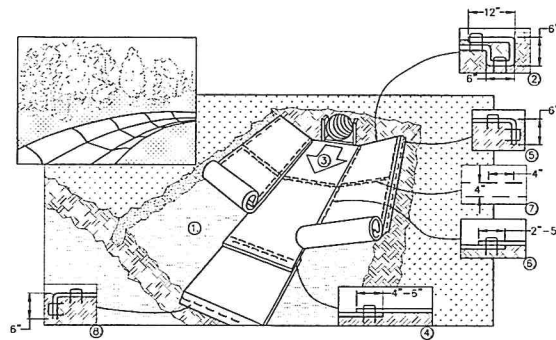
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| drawn by:       | AAF        |
| checked by:     | JUS        |
| scale:          | AS SHOWN   |
| date:           | 3 MAY 2017 |
| released for:   | PERMITTING |

sheet description:  
**STORMWATER  
SYSTEM PLAN**

**C2.01**

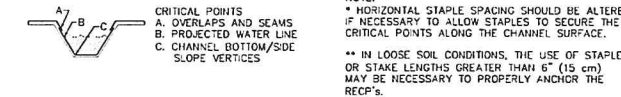
SHEET 8 OF 12





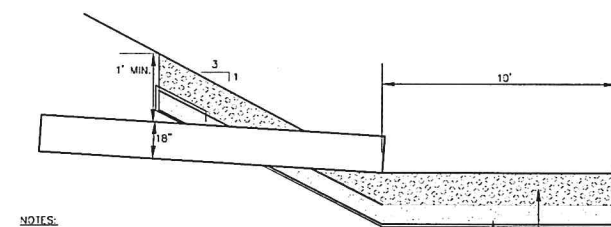
1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE RECP's IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECP'S EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF RECP'S BACK OVER SEED AND COMPACTED SOIL. SECURE RECP'S OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" ACROSS THE WIDTH OF THE RECP'S.
3. ROLL CENTER RECP'S IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. RECP'S WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP'S MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. PLACE CONSECUTIVE RECP'S END OVER END (SHINGLE STYLE) WITH A 4" - 6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE RECP'S.
5. FULL LENGTH EDGE OF RECP'S AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT RECP'S MUST BE OVERLAPPED APPROXIMATELY 2" - 5" (DEPENDENT ON RECP'S TYPE) AND STAPLED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE RECP'S MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY ANCHOR THE RECP'S.



### CHANNEL INSTALLATION ROLLED EROSION CONTROL MATTING

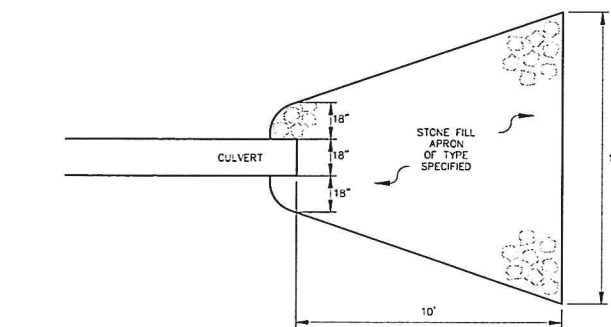
NOT TO SCALE



#### NOTES:

1. TOP OF STONE LAYER SHALL MATCH GRADE.
2. APRON TO BE CONSTRUCTED LEVEL.
3. THICKNESS OF STONE BLANKET SHALL AS INDICATED BELOW

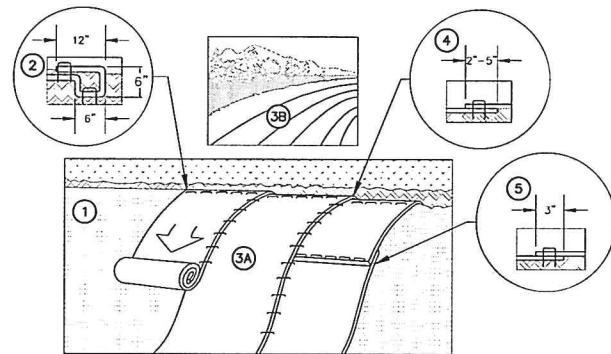
| TYPE | THICKNESS (IN) |
|------|----------------|
| 1    | 18"            |



NOTE: TOP OF STONE LAYER SHALL MATCH GRADE.

### ROCK OUTLET PROTECTION

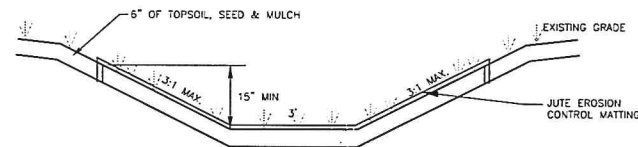
NOT TO SCALE



1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECP'S EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF RECP'S BACK OVER SEED AND COMPACTED SOIL. SECURE RECP'S OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE RECP'S.
3. ROLL THE RECP'S (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP'S WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP'S MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP'S MUST BE STAPLED WITH APPROXIMATELY 2" TO 5" OVERLAP DEPENDING ON RECP'S TYPE.
5. CONSECUTIVE RECP'S SPICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE RECP'S WIDTH. NOTE: \*IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE RECP'S.

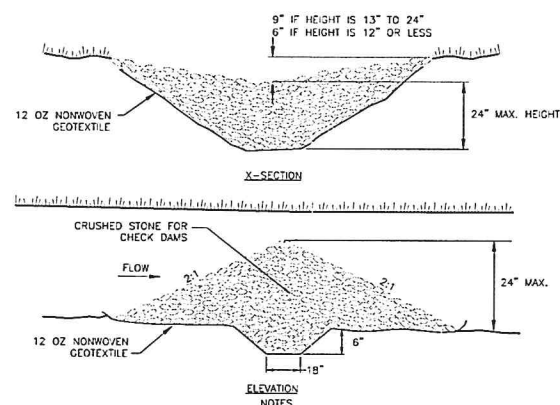
### SLOPE INSTALLATION ROLLED EROSION CONTROL MATTING

NOT TO SCALE



### TYPICAL GRASS LINED TREATMENT/CONVEYANCE CHANNEL

NOT TO SCALE

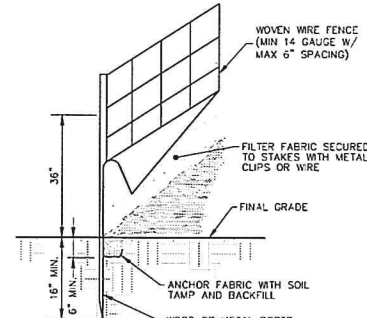


#### NOTES

1. STONE CHECK DAMS WILL BE PLACED AS SHOWN ON THE PLANS.
2. EXTEND STONE A MAXIMUM OF 1.5 FEET BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
3. PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR TURF REINFORCEMENT MATTING AS APPROPRIATE.
4. ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE BY DISPLACED STONE.

### STONE CHECK DAM

NOT TO SCALE



#### INSTALLATION NOTES:

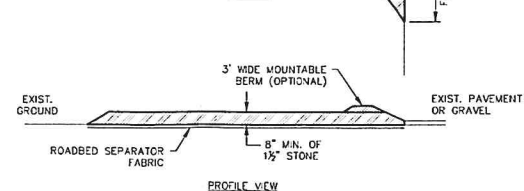
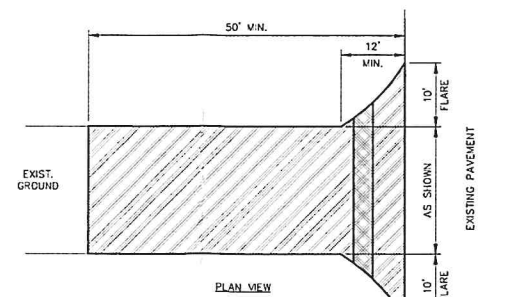
1. DRIVE POSTS A MINIMUM OF 16" INTO THE GROUND.
2. EMBED GEOTEXTILE PLACED IN A 8"x8" TRENCH.
3. POST SPACING SHALL BE AS FOLLOWS:
  - 3.1. FOR WIRE MESH BACKED FENCE, SPACING SHALL NOT EXCEED 10'-0".
  - 3.2. WITHOUT WIRE MESH AND FABRIC ELONGATION IS GREATER THAN OR EQUAL TO 50%, POST SPACING SHALL NOT EXCEED 4'-0".
  - 3.3. WITHOUT WIRE MESH AND FABRIC ELONGATION IS LESS THAN 50%, STAKE SPACING SHALL NOT EXCEED 6'-0".
4. MAINTAIN A 10'-0" BORDER BETWEEN THE SILT FENCE AND CONSTRUCTION ACTIVITY.
5. INSTALL SILT FENCE PARALLEL TO CONTOUR LINES, I.E. THE GROUND ELEVATION AT THE BASE OF THE FENCE SHALL BE AT CONSTANT ELEVATION OR LEVEL.
6. USE A CONTINUOUS SHEET OF GEOTEXTILE TO PREVENT FAILURE AT JOINTS.
7. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES. WIRE FENCE REINFORCEMENT REQUIRED WITHIN 100 FT UPSLOPE OF RECEIVING WATERS.
8. GEOTEXTILE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH WIRE TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6" MAXIMUM MESH OPENING.
9. WHEN TWO SECTIONS OF FILTER CLOTH ADJON EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED TOGETHER.
10. PREFABRICATED UNITS SHALL BE GEOFAB, ENVROFENCE, OR APPROVED EQUIVALENT.

#### MAINTENANCE NOTE:

1. CHECK AFTER EVERY RAINFALL EVENT AND WEEKLY.
2. REMOVE SEDIMENT WHEN IT REACHES 1/2 OF FENCE HEIGHT.
3. PATCH TORN FENCES, OR REPLACE THE ENTIRE FENCE SECTION WHEN TEARS OCCUR.
4. IF WATER IS BREAKING THROUGH SILT FENCE THEN IT MUST BE REINFORCED W/STONE.

### SILT FENCE

NOT TO SCALE

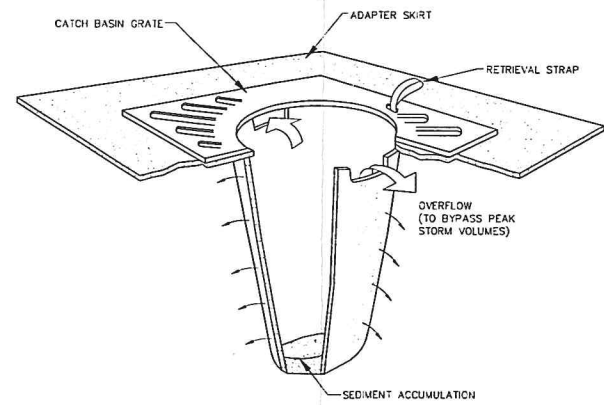


#### NOTES:

1. THE PURPOSE IS TO REMOVE MUD FROM TIRES OF CONSTRUCTION VEHICLES.
2. WHEN STONE BECOMES CLOGGED AND INEFFECTIVE, TOPDRESS WITH 3" OF NEW STONE OR REPLACE ENTIRE PAD.
3. IF TIRE WASHING IS REQUIRED, WASH WATER SHALL DRAIN INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
4. STONE SIZE- USE 1-4 INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
5. SURFACE WATER- ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
6. MAINTENANCE- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY USING CLOSED-BROOM EQUIPMENT.
7. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED ACCORDING TO PERMIT REQUIREMENTS

### STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE



#### NOTES

1. ACCEPTABLE PRODUCTS INCLUDE "SILTSACK" AND "STREAM GUARD" MANUFACTURED BY GEO-SYNTHETICS INC. OR PARKER SYSTEMS, INC., RESPECTIVELY.
2. INSERT TO BE EMPTIED WHEN IT IS 1/2 FULL OF SEDIMENT.
3. INSPECT INSERT AFTER ANY RAINFALL EVENT AND REPAIR AND MAINTAIN AS REQUIRED.

### SEDIMENT CATCH BASIN INSERT

NOT TO SCALE

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no. date revision

1

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PLANNING & ZONING

project name: **RHINO FOODS  
BUILDING ADDITION**  
project location: **79 INDUSTRIAL PARKWAY  
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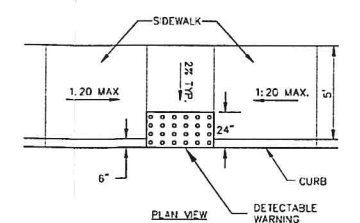
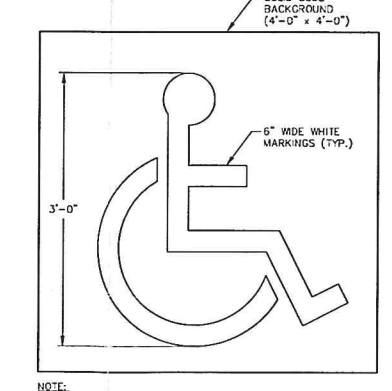
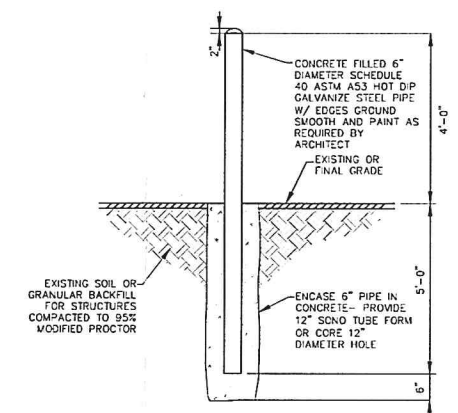
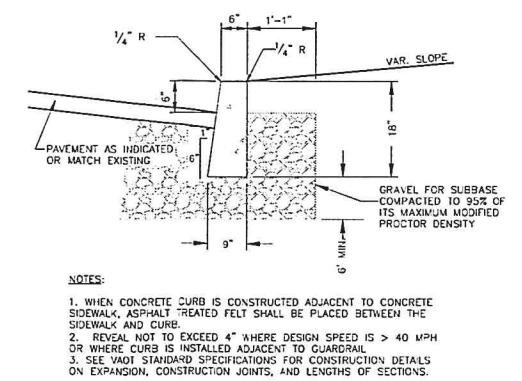
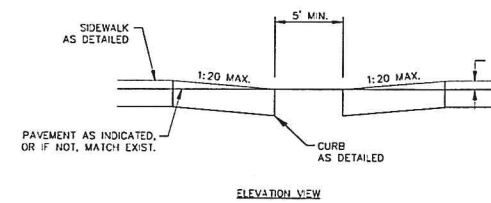
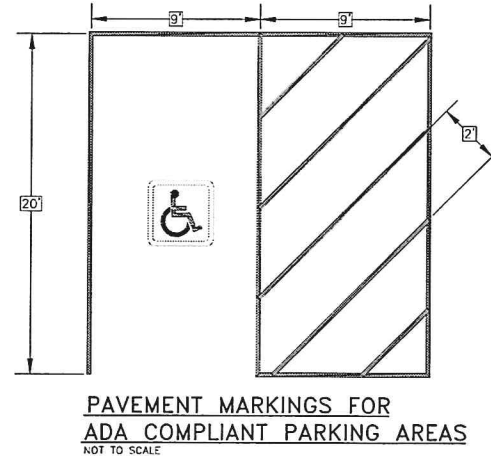
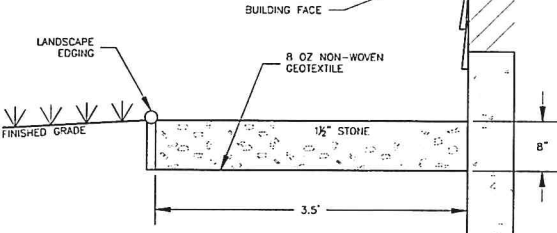
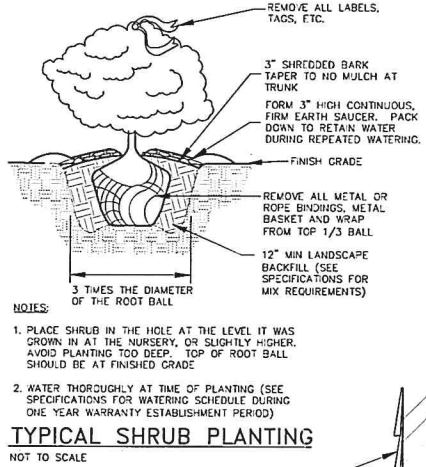
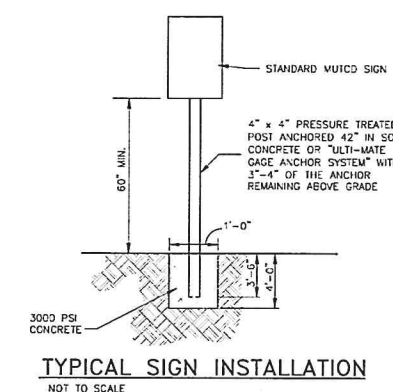
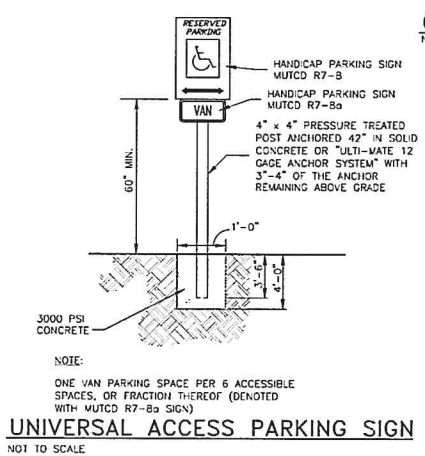
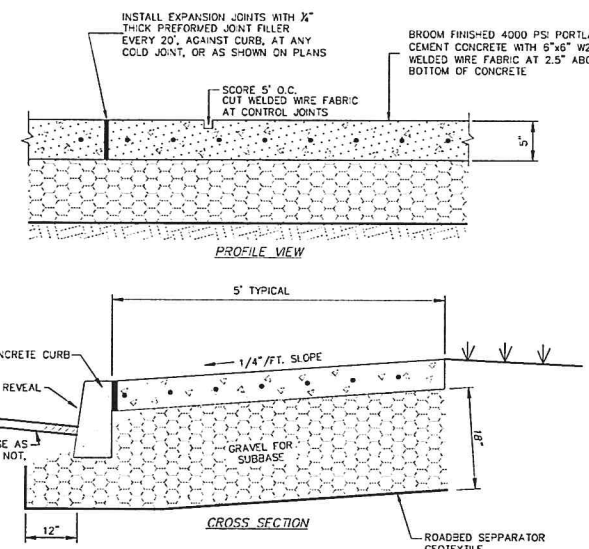
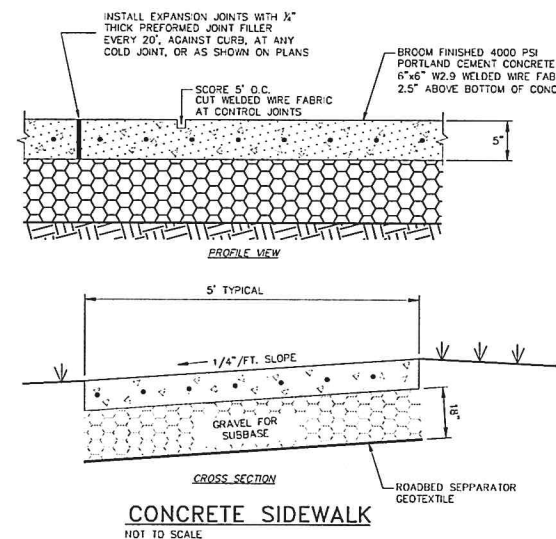
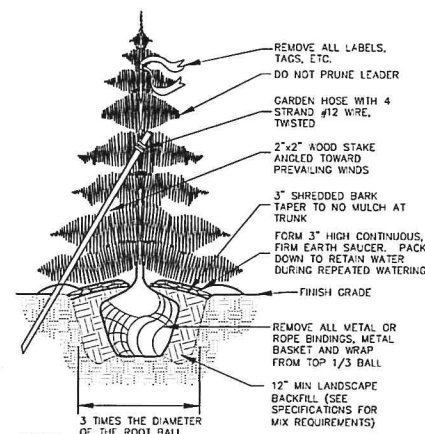
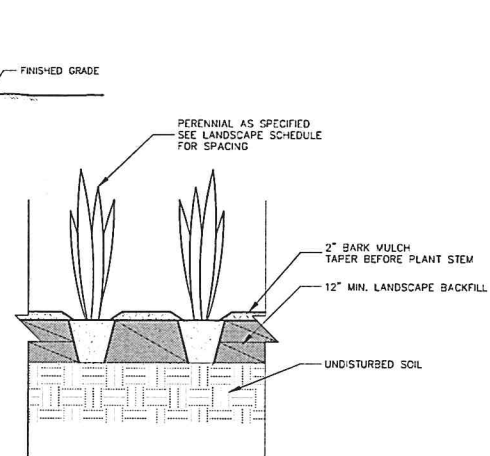
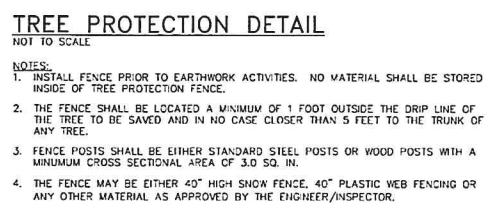
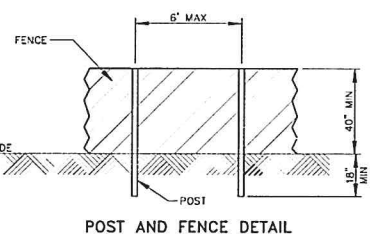
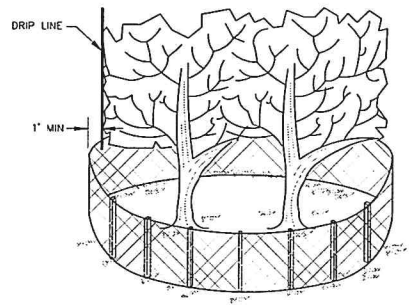
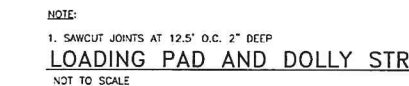
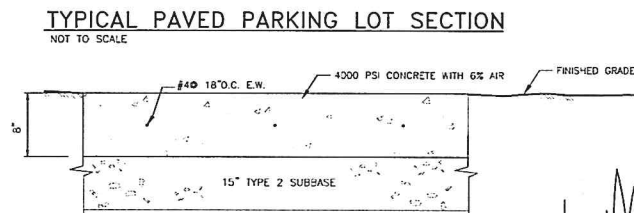
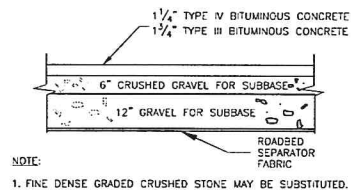
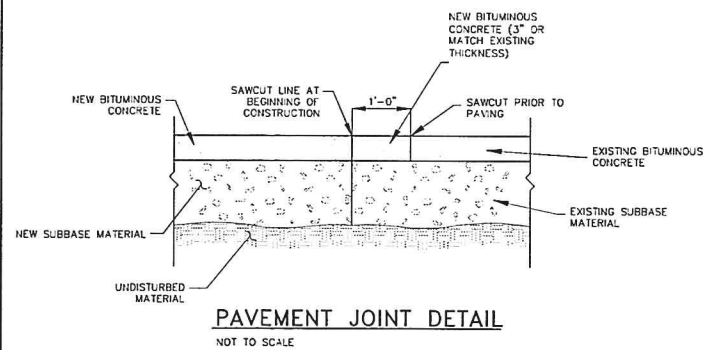
sheet description:  
**CONSTRUCTION  
DETAILS**

**C5.01**

SHEET 9 OF 12



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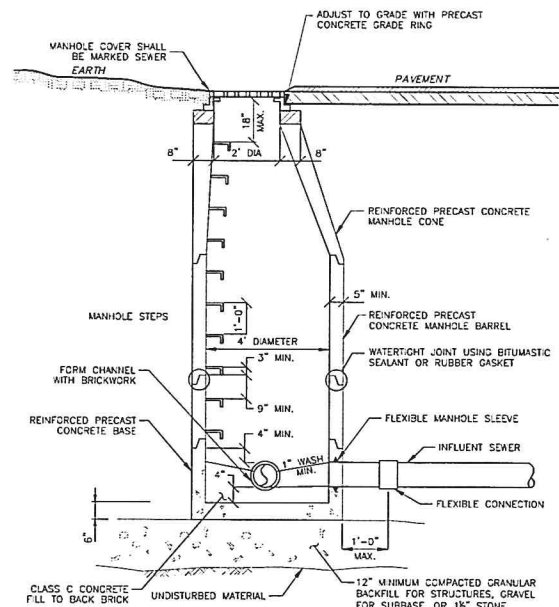


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no. date revision  
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project name: RHINO FOODS BUILDING ADDITION  
project location: 79 INDUSTRIAL PARKWAY BURLINGTON, VERMONT  
client: CMC DESIGN/BUILD, INC.

project number: 16107  
drawn by: AAF  
checked by: JJS  
scale: AS SHOWN  
date: 3 MAY 2017  
released for: PERMITTING  
sheet description: CONSTRUCTION DETAILS  
**C5.02**  
SHEET 10 OF 12

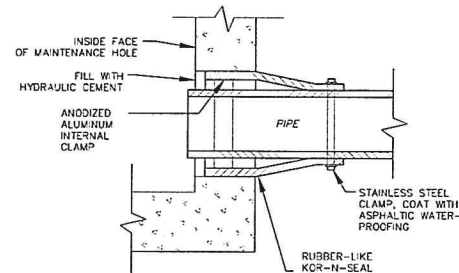


#### NOTES:

1. WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A FLAT REINFORCED CONCRETE COVER WITH AN ECCENTRIC OPENING AND CAPABLE OF H-20 WHEEL LOADS MAY BE USED.
2. ALL MANHOLES SHALL BE DESIGNED FOR H-20 WHEEL LOADS.

#### SEWER MANHOLE DETAIL

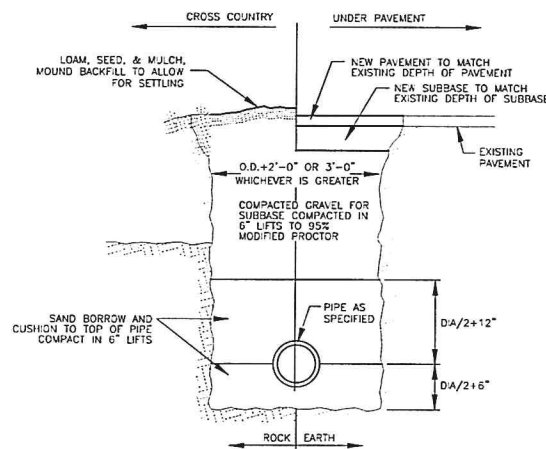
NOT TO SCALE



#### KOR-N-SEAL FLEXIBLE MAINTENANCE HOLE SEAL

(FOR EXISTING AND NEW MAINTENANCE HOLES)

NOT TO SCALE

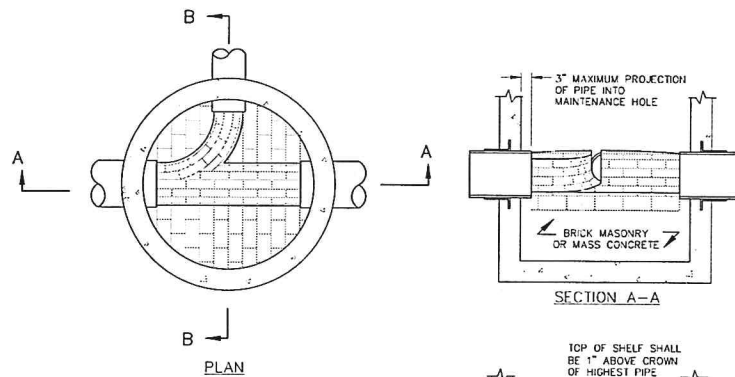


#### NOTE:

1. BRACING AND SHEETING OR OTHER TRENCH PROTECTION TO BE PROVIDED TO MEET APPLICABLE STATE AND D.S.H.A. SAFETY STANDARDS. ALL SUCH TRENCH PROTECTION TO BE RESPONSIBILITY OF THE CONTRACTOR.

#### TYPICAL TRENCH LIMITS AND BEDDING DETAIL

NOT TO SCALE

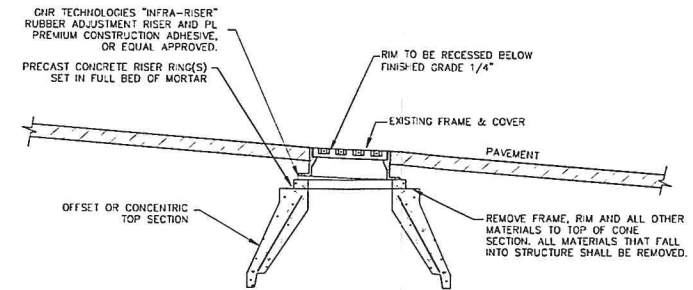


#### NOTES:

1. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. INVERT BRICKS SHALL BE LAID ON EDGE.
2. INVERT AND SHELVE TO BE PLACED AFTER LEAKAGE TEST.

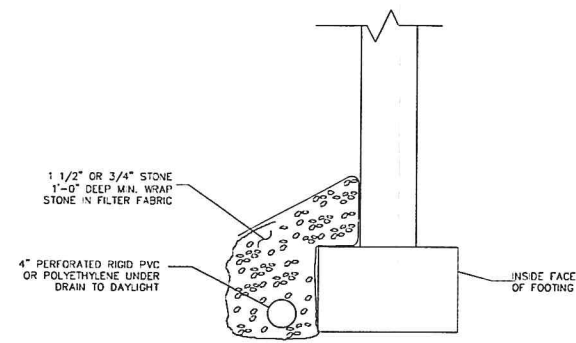
#### TYPICAL SEWER MANHOLE INVERT

NOT TO SCALE



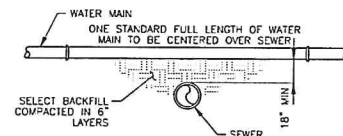
#### EXISTING FRAME & COVER ADJUSTMENT DETAIL

NOT TO SCALE

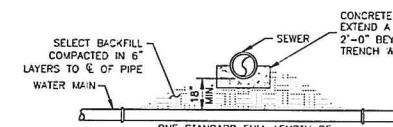


#### FOOTING DRAIN DETAIL

NOT TO SCALE

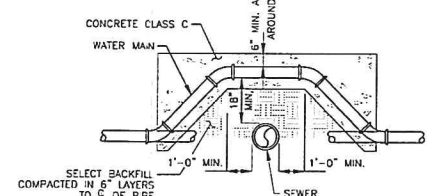


#### DETAIL NO.1 (PREFERRED) NEW WATER MAIN - ABOVE SEWER

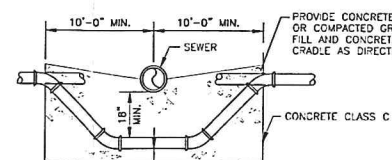


\* NOT A RECOMMENDED METHOD

#### DETAIL NO.3 WATER MAIN - BELOW SEWER\*



#### DETAIL NO.2 NEW WATER MAIN OR RECONSTRUCTION



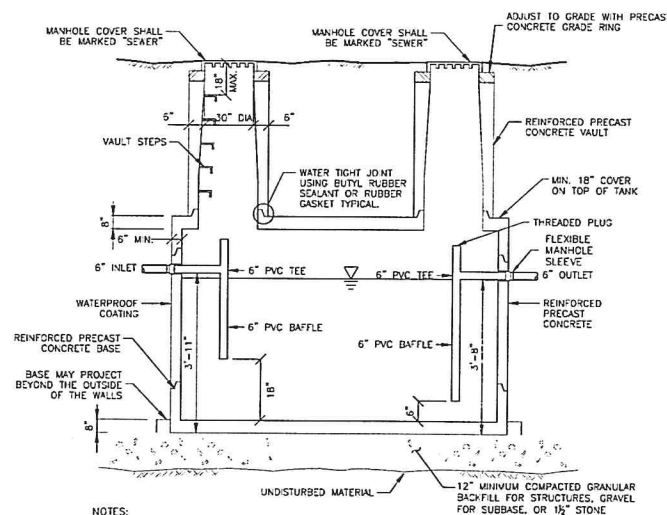
#### DETAIL NO.4 WATER MAIN RELOCATION - BELOW SEWER\*

#### NOTES:

1. DETAILS NO.1 & NO.2 ALLOWABLE WATER PIPE DEFLECTIONS MAY BE USED TO ACCOMPLISH THE RELOCATIONS IN LIEU OF ELBOWS AND FITTINGS.
2. DETAILS NO.2, NO.3, & NO.4 THE SEWER PIPE SHALL BE CONSTRUCTED OR RECONSTRUCTED TO MEET WATER MAIN STANDARDS. OF DUCTILE IRON PIPE WITH PUSH ON OR MECHANICAL JOINTS A MINIMUM OF 20 FEET EITHER SIDE OF THE WATER LINE. THE ENTIRE SECTION CONSTRUCTED TO MEET WATERLINE STANDARDS MUST BE PRESSURE TESTED TO MAINTAIN 50 PSI FOR 15 MINUTES WITHOUT LEAKAGE PRIOR TO BACKFILLING BEYOND ONE FOOT ABOVE THE PIPE TO ASSURE WATER TIGHTNESS.
3. DETAILS NO.3 & NO.4 UNDER NO CIRCUMSTANCES SHALL THE SEWER BE LESS THAN 18\"/>

#### WATER/SEWER CROSSING DETAILS

NOT TO SCALE



#### NOTES:

1. WHEN VAULT DEPTH IS LESS THAN 5 FEET, A FLAT REINFORCED CONCRETE COVER WITH AN ECCENTRIC OPENING AND CAPABLE OF HS-20 WHEEL LOADS MAY BE USED.
2. ALL PORTIONS OF THIS STRUCTURE SHALL BE DESIGNED FOR HS-20 WHEEL LOADS.
3. VAULT TO BE 1000 GAL; 5'(W) x 10'(L) x 3'-8\"/>

#### 1000 GALLON OIL/GREASE INTERCEPTOR

NOT TO SCALE

Civil & Structural Engineers  
**DeWolfe**  
ENGINEERING ASSOCIATES  
PAVEMENT SPECIAL CORPORATION  
1000 STATE STREET, SUITE 100  
BURLINGTON, VERMONT 05401-1000

no. date revision



RECEIVED  
MAY 09 2017

DEPARTMENT OF  
PLANNING & ZONING

project name: **RHINO FOODS BUILDING ADDITION**

project location: **79 INDUSTRIAL PARKWAY BURLINGTON, VERMONT**

client: **CNC DESIGN/BUILD, INC.**

project number: 16107  
drawn by: AAF  
checked by: JJS  
scale: AS SHOWN  
date: 3 MAY 2017  
released for: PERMITTING

CONSTRUCTION  
DETAILS

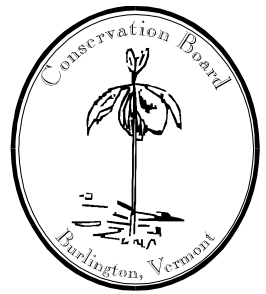
**C5.03**

SHEET 11 OF 12

## Burlington Conservation Board

149 Church Street  
Burlington, VT 05401  
<http://www.ci.burlington.vt.us/planning/>  
Telephone: (802) 865-7191  
(802) 865-7195 (FAX)

Matt Moore, Chair  
Will Flender, Vice Chair  
Don Meals  
Scott Mapes  
Jeff Severson  
Miles Waite  
Damon Lane  
Zoe Richards  
Stephanie Young



## Annual Report of the Burlington Conservation Board

Fiscal Year 2017: June 30, 2016 – July 1, 2017

The Burlington Conservation Board (BCB) acts as the primary entity within the City for comprehensive environmental planning and review. Conservation Board members provide volunteer services in their areas of environmental expertise, which include wetland biology, engineering, water quality, stormwater management, energy efficiency, transportation planning, land conservation and management, and the law. The Board provides thoughtful comment and guidance on all major impact development projects and on those affecting significant natural areas. The Board also conducts field observations when appropriate. Board members make a practice to recuse from project review if he/she has consulted for an applicant in the past, even if not involved in the current application. We strive to develop and sustain effective communication with the Planning Commission, Development Review Board, and other City departments. The BCB has partnered with the Department of Parks and Recreation on open space management and planning through the Conservation Legacy Program. The BCB has also worked with personnel from the Department of Public Works on stormwater management matters in the city. The work of the Conservation Board relies upon the support of the Department of Planning and Zoning, which provides staffing, development review coordination, and planning expertise crucial to Board function.

As in past years, the Board has continued to focus on three primary areas: (1) development review, (2) implementation of Chapter 26: Wastewater, Stormwater, & Pollution Control, and (3) open space planning. Some of our achievements during the last year are described below.

### **FOCUS AREAS:**

#### **1) DEVELOPMENT REVIEW**

The BCB reviewed 9 projects this year as opposed to 8 last year. Two of the projects, 329-375 North Ave and 75 Cherry Street, required multiple meetings due to their scope and complexity. In FY 2017, the BCB evaluated the following development proposals and gave advice and specific recommendations to the Development Review Board, Department of Planning and Zoning, and the Department of Public Works:

- **316 Flynn Ave** Review of new mixed use 30-apartment unit / commercial building
- **702 Lake St** Review of winter snow storage for the city
- **80 Colchester Ave** Review of 75-unit residential building
- **329-375 North Ave** Review of 733-unit, 45K sf commercial space mixed use project
- **75 Cherry St** Review of mixed use redevelopment of downtown mall
- **29 Starr Farm Bc** Review of new stone seawall
- **400 Pine St** Review of project to construct new mixed use building

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For accessibility information call 865-7188 (865-7142 TTY).

- **234 Penny Ln** Review of new marina on downtown waterfront
- **85 North Ave** Review of 43-unit apartment building

In review of these projects, the BCB made specific recommendations pertaining to stormwater management and maintenance and to the minimization of wetland and lakeshore buffer impacts.

## **2) IMPLEMENTATION OF CHAPTER 26**

Chapter 26: Wastewater, Stormwater, & Pollution Control contains the city's stormwater standards and ties into zoning via the Comprehensive Development Ordinance. The Conservation Board continues to work with project applicants and the city's Stormwater Program staff in implementing the stormwater management provisions of this ordinance. The Board has encouraged innovative design and incorporation of functional green spaces into project designs for stormwater retention and infiltration. Particular attention has been paid to unique site sensitivities, receiving waters and city systems, and feasibility within the context of particular development proposals. There has been a consistent push to improve stormwater management practices, particularly on redevelopment sites. In particular, the Board has sought to require developers' stormwater engineers to conduct field testing (test pits, infiltration test) prior to putting together the stormwater design.

Outside of project review, the Board has discussed with Public Works the opportunity for integration of standard stormwater recommendations with approvals issued by Public Works' stormwater program. The Board also commends the progressive stormwater management standards now in place within the recently established Downtown Mixed Use Core overlay.

## **3) OPEN SPACE PLANNING**

The Board played an active role in the conservation of 12 acres of the former Burlington College lands on North Avenue. This conservation was formalized following approval of the related mixed use development on the adjacent acreage. On other matters, the Board worked with the Winooski Valley Park District and the Lake Champlain Land Trust for several smaller conservation efforts within the city. The Board has more recently engaged with Parks & Recreation in a sustained effort targeted at the city's recreational trails network. The effort is intended to bring stakeholders together, to improve trails connectivity, and to better inform the public of their location and accessibility.

## **OTHER ACTIVITIES:**

### **CONNECTIONS**

In the course of these activities, the BCB has maintained and developed important connections with other city departments and organizations during the past year, including:

- Development Review Board (review of individual development proposals)
- Parks & Recreation Department (Conservation Legacy Program, land acquisition, trails initiative, open space planning, urban reserve)
- Planning Commission (Riverside Ave rezone request)
- Long Range Planning Committee (comprehensive planning)
- Department of Public Works (stormwater management)
- Winooski Valley Park District conservation efforts
- Lake Champlain Land Trust conservation efforts

## **FUTURE PRIORITIES**

The Burlington Conservation Board will continue to provide the City and developers with timely review of proposals that have potentially significant environmental impacts. We will continue to work with the DRB on development review issues. Stormwater management will continue to be a high priority, and the BCB will work with Stormwater Program staff to develop stormwater performance standards for future development. The BCB will also work with Parks & Recreation to improve our city's trails system and public awareness and use of it.

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Matt Moore, Chair

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Will Flender, Vice ChairDon Meals

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Scott Mapes

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Jeff Severson

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Damon Lane

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Miles Waite

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Zoe Richards

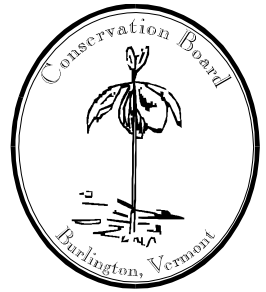
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Stephanie Young

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## Conservation Board Meeting Minutes

Monday, June 5, 2017 – 5:30 pm

Planning & Zoning Conference Room – City Hall Lower Level  
149 Church Street

### Attendance

- **Board Members:** Zoe Richards (ZR), Jeff Severson (JS), Stephanie Young (SY), Miles Waite (MW), Scott Mapes (SM), Don Meals (DM), Damon Lane (DL)
- **Absent:** Will Flender (WF), Matt Moore (MM)
- **Public:** John Svagzdys, Gene Seinfeld, Elisa Nelson, Sophie Mazowita, R Paul Smith, and Charles Goodnight (79 Industrial Parkway)
- **Staff:** Scott Gustin (Planning & Zoning)

JS, Acting Chair, called the meeting to order at 5:30 p.m.

### Minutes

May 1, 2017

A MOTION made by SM and SECONDED by MW:

Accept the minutes of May 1, 2017 as written.

Vote: 5-0-2

### Board Comment

DM said he's redoing his driveway with permeable pavers. He has encountered the city's ambiguous permit process. He got the zoning permit and then went to get a building permit. He was told by DPW that no building permit is needed. A building permit folder was created in order to close out the permit. He thinks the city needs to straighten this out. He said he also applied for subsidy via DPW for his driveway project. He was eventually told that the city has no funding for this program. His request was forwarded to the Lake Champlain Sea Grant. He's now getting questions from the city's stormwater program about project parameters. The permit process is not easy. He's also getting 0 lot coverage credit for the project. SM noted the bonus provision associated with the pervious pavement. DM said he thinks there should be lot coverage credit. There's no stormwater fee credit. There's really no incentive for a homeowner to do this.

MM appeared at 5:35 PM.

ZR said she has a gravel driveway and does not think it is pervious at all. SM said that gravel is basically impervious, like asphalt. SM said that a pervious paver system can be designed to easily accept the 1-year storm event.

JS made a suggestion for a future BCB agenda item. The ongoing bike path reconstruction included rare plant protection measures as discussed by the BCB during project review. Jesse Bridges noted that the consultants were charged by PRW with protection of these rare plants. Maybe we could ask Dan Cahill for an update as to how that work has gone so far. The recap might be able to help guide us when doing

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future reviews. SM, ask for the rare plant protection measures (site evaluation of where things are and what was done to protect them).

DM noticed some fresh erosion control fabric at the Champlain School. Is it tied to remediation of knot weed? ZR said that she's not aware of any remediation work.

SG noted paper CDO availability.

MM said he got a note from VT Association of Conservation Commissions asking to renew our membership. The fee is \$50. JS said that there's no direct benefit, but it was useful when the Burlington Conservation Board was originally established. DM, they do support the creation of new conservation boards. JS said that they offer small grants for local conservation boards. MM asked that SG look into renewing membership.

MM also mentioned that several board members' terms are expiring this summer. SM said he's reapplied. DL said that he's up too but did not reapply. MM is up too but has not reapplied yet. SM suggested contacting Lori Olberg directly.

#### **Public comment**

None.

#### **Open Space Subcommittee**

No meeting today.

ZR noted the proposed resolution formalizing the conservation trails effort on the City Council's agenda tonight.

#### **Project Review**

##### **1. 17-1097CA/MA; 79 Industrial Pkwy (Ward 5S, ELM) Rhino Foods, Inc.**

Construct 2 building additions, 14,200 sf of building footprint, paving of an existing parking lot, construction of a new parking lot, access drive, and stormwater system, and associated site grading.

John Svagzdys and Gene Seinfeld appeared on behalf of the application.

MW recused himself. He's advised Rhino Foods as to an environmental site assessment on a neighboring property.

John Svagzdys overviewed the existing conditions on the site plan. He pointed out the proposed work consisting of new additions, parking, and site access. He went on to address stormwater management. A grass swale will capture runoff and direct it to an onsite stormwater pond. The project is subject to a state stormwater permit.

SM asked about the extent of the wetlands. Mr. Svagzdys said it's just the class 3 within the roadside channel.

JS, will you show the limits of woods? Mr. Svagzdys noted the location on the site plan. He indicated that the corridor of woodland will remain. A small area jutting out will be removed.

Sophie Mazowita said she's looked at wildlife corridors in this area. There is a lot of movement in this area of various species. This is mostly edge habitat linking larger habitat areas together. She'd like to see tree clearing limited. She'd like to see the woodland corridor stay intact. She recommends vertical slat fencing and/or lifting the fence off the ground.

Mr. Svagzdys pointed out new plantings. DM asked what kinds they are, whether shrubs or trees. Mr. Svagzdys said they are mostly shrubs with some trees mixed in.



MM asked for key points relative to stormwater management. SM asked about the state stormwater permit. Where is discharge ultimately headed to? Mr. Svagzdys said it ends up in a roadside ditch. The ditch eventually ends up in Englesby Brook. SM asked if the state is applying standards specifically for discharge into Englesby. Mr. Svagzdys said he was not sure. SM said he suspects that the state is requiring an individual permit due to Englesby. MM pointed out that the packet info shows an individual state permit.

DM, how does the grass swale get cleaned of accumulated sand? Mr. Svagzdys said that the maintenance plan calls for cleaning out once sand reaches a set level.

Elisa Nelson said that most of the back line of trees – about 30' – 40' in depth was cleared. She was told that the clearing was done to protect the building. She said that many of the trees were limbed up. There are just trunks at the ground level.

SM asked about the tree cutting that's been done. SG said that it was reviewed and approved by the DRB. SM asked if there's any provision to allow growth of underbrush. Gene Seinfeld said the plan does not specifically address this, but there's no problem with allowing the regrowth at this point.

ZR, given the present conditions, is natural regeneration sufficient or will additional new plantings be installed? Ms. Mazowita said that the new plantings will be beneficial. DM said that the understory of the forest will regenerate on its own.

Ms. Mazowita asked why the fence line is the way that it is. Ms. Nelson said that she requested that the fence be extended, in part, to screen the large nitrogen tanks. She also requested that more evergreen trees be included in the plan. Ms. Mazowita said the fence itself is not necessarily bad. The more vegetation, the better for wildlife movement. Mr. Svagzdys asked Ms. Mazowita what she thinks about the staggered fence line. Ms. Mazowita replied that she's not opposed to extending the fence line.

Ms. Nelson mentioned the rooftop mechanical units. Mr. Seinfeld said they will be screened. Ms. Nelson mentioned some that are out of repair. Mr. Seinfeld said that they will be taken care of.

Ms. Nelson said that noise has been a persistent problem.

JS said the fence and plantings have a potential benefit for wildlife. He said that thickening of the canopy with something like cedars would create additional benefit.

Ms. Nelson asked about the height at which tree caliper is measured. SG mentioned that caliper measurement is specified in the CDO. It's basically equivalent to DBH.

Ms. Nelson mentioned that the stormwater ditches along Industrial Parkway frequently flood during storm events. She hopes this project helps. DM suspects that this project won't help with the ditch flooding. If the pond is constructed correctly, it will mitigate peak flows into the ditch. Mr. Svagzdys said that discharge will be reduced for the 1 and 10 year storm event.

JS said that he thinks the wetland delineation is pretty generous. More than half appears to be the ditch. It does not look to be something that would have functions and values. The permit application notes that it will be addressed. He does not see any issues.

A MOTION was made by JS and SECONDED by DM:

We support the project as designed and make the following recommendations:

- New plantings, including additional evergreens such as arborvitae, should be added along the northern property boundary in a staggered configuration.
- To the northwest of that line, the area should be left unmanaged to allow understory growth providing for wildlife habitat in this corridor.

- If the fence is to be extended, it should be staggered as well. The fence should be installed in such a way as to avoid additional tree clearing. Tree clearing should be limited to the triangular spot shown on the site plan.

Vote: 6-0-1, motion carried.

## **Update & Discussion**

### **1. Conservation trails initiative**

ZR said there's a bunch of interesting stuff happening with the lands behind the high school. There are a number of stakeholders involved. There's been a good bit of progress in gaining control of the property and in dealing with the trail networks.

MW asked if there's a vernal pool behind the Alliance Church. JS said there's more than one.

### **2. FY '17 Annual Report**

No additional comments were received from Board members. The document was signed by all present.

## **Adjournment**

The meeting adjourned at 7:15 PM.