238A.A-1

2005-0225
2006-0178
2006-0131

41 Hutchins Drive

Bld. Addition and Amendment

Cadcam
Eric Cianchette
Woodard + Curran

CITY OF PORTLAND, MAINE
DEVELOPMENT REVIEW APPLICATION
PLANNING DEPARTMENT PROCESSING FORM
DRC Copy

2006-0178
Application I. D. Number

9/18/2006
Application Date

Cadcam Associates
Applicant

41 Hutchins Dr, Portland, ME 04102
Applicant's Mailing Address

Amendment to Plan - Woodard & Curra
Project Name/Description

Consultant/Agent

41 - 41 Hutchins Dr, Portland, Maine
Address of Proposed Site

Applicant Ph: (207) 774-2112 **Agent Fax:**
Applicant or Agent Daytime Telephone, Fax

238A A001001
Assessor's Reference: Chart-Block-Lot

Proposed Development (check all that apply): ☐ New Building ☐ Building Addition ☐ Change Of Use ☐ Residential ☐ Office ☐ Retail ☐ Manufacturing ☐ Warehouse/Distribution ☐ Parking Lot ☑ Other (specify) **Amendment to Plan**

Proposed Building square Feet or # of Units

289674
Acreage of Site

IM
Zoning

Check Review Required:

☑ Site Plan (major/minor)
☐ Subdivision # of lots ______
☐ PAD Review
☐ 14-403 Streets Review
☐ Flood Hazard
☐ Shoreland
☐ HistoricPreservation
☐ DEP Local Certification
☐ Zoning Conditional Use (ZBA/PB)
☐ Zoning Variance
☐ Other ______

Fees Paid: Site Pla ______ Subdivision ______ Engineer Review ______ Date ______

DRC Approval Status:

Reviewer ______

☐ **Approved**
☐ **Approved w/Conditions** See Attached
☐ **Denied**

Approval Date ______ Approval Expiration ______ Extension to ______ ☐ Additional Sheets Attached

☐ Condition Compliance ______ signature ______ date ______

Performance Guarantee ☐ **Required*** ☐ **Not Required**

* No building permit may be issued until a performance guarantee has been submitted as indicated below

☐ Performance Guarantee Accepted ______ date ______ amount ______ expiration date

☐ Inspection Fee Paid ______ date ______ amount

☐ Building Permit Issue ______ date

☐ Performance Guarantee Reduced ______ date ______ remaining balance ______ signature

☐ Temporary Certificate of Occupancy ______ date ☐ Conditions (See Attached) ______ expiration date

☐ Final Inspection ______ date ______ signature

☐ Certificate Of Occupancy ______ date

☐ Performance Guarantee Released ______ date ______ signature

☐ Defect Guarantee Submitted ______ submitted date ______ amount ______ expiration date

☐ Defect Guarantee Released ______ date ______ signature

CITY OF PORTLAND, MAINE
DEVELOPMENT REVIEW APPLICATION
PLANNING DEPARTMENT PROCESSING FORM
Planning Copy

2006-0178
Application I. D. Number

9/18/2006
Application Date

Cadcam Associates
Applicant

41 Hutchins Dr, Portland, ME 04102
Applicant's Mailing Address

Amendment to Plan - Woodard & Curra
Project Name/Description

Consultant/Agent

41 - 41 Hutchins Dr, Portland, Maine
Address of Proposed Site

Applicant Ph: (207) 774-2112 **Agent Fax:**
Applicant or Agent Daytime Telephone, Fax

238A A001001
Assessor's Reference: Chart-Block-Lot

Proposed Development (check all that apply): ☐ New Building ☐ Building Addition ☐ Change Of Use ☐ Residential ☐ Office ☐ Retail
☐ Manufacturing ☐ Warehouse/Distribution ☐ Parking Lot ☑ Other (specify) **Amendment to Plan**

Proposed Building square Feet or # of Units

289674
Acreage of Site

IM
Zoning

Check Review Required:

☑ Site Plan (major/minor)
☐ Subdivision # of lots ______
☐ PAD Review
☐ 14-403 Streets Review
☐ Flood Hazard
☐ Shoreland
☐ HistoricPreservation
☐ DEP Local Certification
☐ Zoning Conditional Use (ZBA/PB)
☐ Zoning Variance
☐ Other ______

Fees Paid: Site Pla ______ Subdivision ______ Engineer Review ______ Date ______

Planning Approval Status:

Reviewer ______

☐ **Approved**
☐ **Approved w/Conditions** See Attached
☐ **Denied**

Approval Date ______ Approval Expiration ______ Extension to ______ ☐ Additional Sheets Attached

☐ OK to Issue Building Permit ______ signature ______ date ______

Performance Guarantee ☐ **Required*** ☐ **Not Required**

* No building permit may be issued until a performance guarantee has been submitted as indicated below

☐ Performance Guarantee Accepted ______ date ______ amount ______ expiration date

☐ Inspection Fee Paid ______ date ______ amount

☐ Building Permit Issue ______ date

☐ Performance Guarantee Reduced ______ date ______ remaining balance ______ signature

☐ Temporary Certificate of Occupancy ______ date ☐ Conditions (See Attached) ______ expiration date

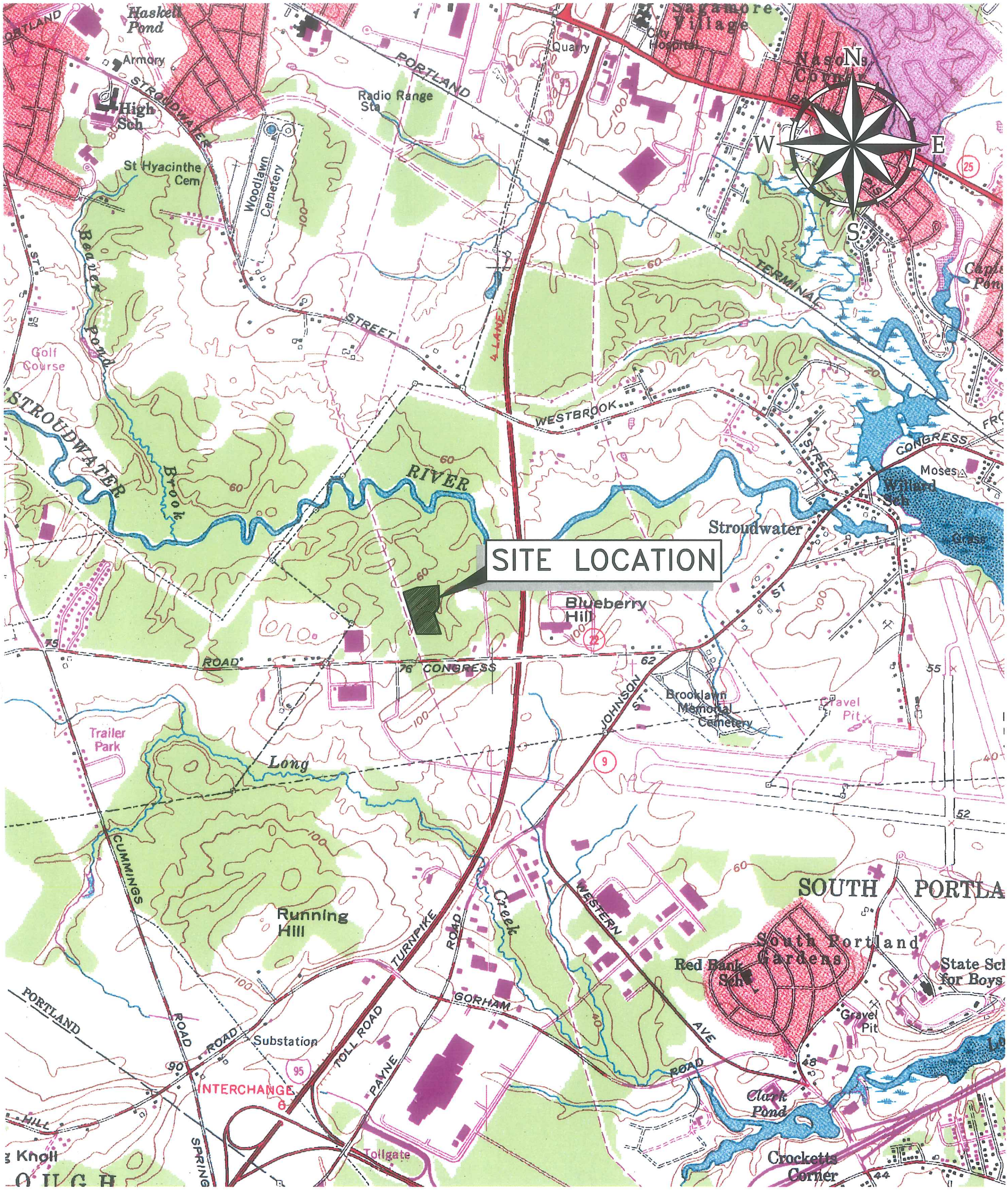
☐ Final Inspection ______ date ______ signature

☐ Certificate Of Occupancy ______ date

☐ Performance Guarantee Released ______ date ______ signature

☐ Defect Guarantee Submitted ______ submitted date ______ amount ______ expiration date

☐ Defect Guarantee Released ______ date ______ signature



NOTE:

TOPO QUADS OBTAINED FROM MAINE OFFICE OF GEOGRAPHIC INFORMATION SYSTEMS.

2000' 0 2000' 4000'

WOODARD & CURRAN Engineering · Science · Operations	USGS TOPOGRAPHIC MAP	CAD–CAM ASSOCIATES PORTLAND, MAINE	JOB NO: 203834.03 DATE: SEPTEMBER 2005 SCALE: 1" = 2000'
PORTLAND, MAINE 800-426-4262	DESIGNED BY: JBC CHECKED BY: BSS DRAWN BY: JBC 20383401-U001.1.dwg	WOODARD & CURRAN INC. OFFICE EXPANSION 41 HUTCHINS DRIVE, PORTLAND, ME	Figure 1.1

CITY OF PORTLAND, MAINE
DEVELOPMENT REVIEW APPLICATION
PLANNING DEPARTMENT PROCESSING FORM
Planning Copy

2005-0225
Application I. D. Number

9/23/2005
Application Date

Cad-Cam Associates
Applicant

41 Hutchins Drive, Portland, ME 04103
Applicant's Mailing Address

Building Addition
Project Name/Description

Consultant/Agent

41 - 41 Hutchins Drive, Portland, Maine
Address of Proposed Site

Applicant Ph: (207) 774-2112 **Agent Fax:**
Applicant or Agent Daytime Telephone, Fax

238A A001
Assessor's Reference: Chart-Block-Lot

Proposed Development (check all that apply): ☐ New Building ☑ Building Addition ☐ Change Of Use ☐ Residential ☐ Office ☐ Retail
☐ Manufacturing ☐ Warehouse/Distribution ☑ Parking Lot ☐ Other (specify) ____

28,450 s.f.
Proposed Building square Feet or # of Units

Acreage of Site

IM
Zoning

Check Review Required:

☑ Site Plan (major/minor)
☐ Subdivision # of lots ____
☐ PAD Review
☐ 14-403 Streets Review
☐ Flood Hazard
☐ Shoreland
☐ HistoricPreservation
☐ DEP Local Certification
☐ Zoning Conditional Use (ZBA/PB)
☐ Zoning Variance
☐ Other ____

Fees Paid: Site Pla **$500.00** Subdivision ____ Engineer Review ____ Date **9/23/2005**

Planning Approval Status:

Reviewer ____

☐ **Approved**
☐ **Approved w/Conditions** See Attached
☐ **Denied**

Approval Date ____ Approval Expiration ____ Extension to ____ ☐ Additional Sheets Attached

☐ OK to Issue Building Permit ____ signature ____ date ____

Performance Guarantee ☐ **Required*** ☐ **Not Required**

* No building permit may be issued until a performance guarantee has been submitted as indicated below

☐ Performance Guarantee Accepted ____ date ____ amount ____ expiration date

☐ Inspection Fee Paid ____ date ____ amount

☐ Building Permit Issue ____ date

☐ Performance Guarantee Reduced ____ date ____ remaining balance ____ signature

☐ Temporary Certificate of Occupancy ____ date ☐ Conditions (See Attached) ____ expiration date

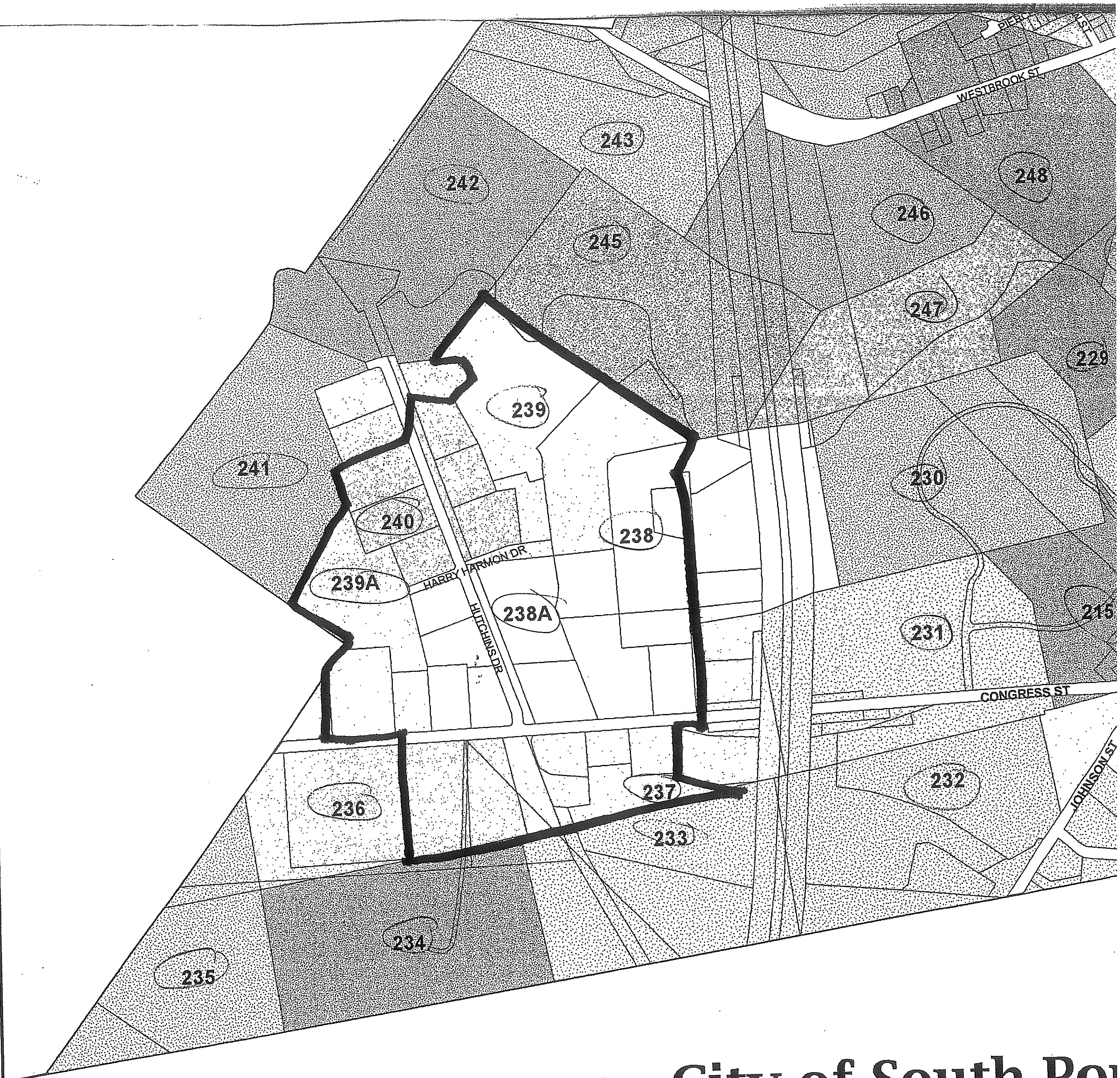
☐ Final Inspection ____ date ____ signature

☐ Certificate Of Occupancy ____ date

☐ Performance Guarantee Released ____ date ____ signature

☐ Defect Guarantee Submitted ____ submitted date ____ amount ____ expiration date

☐ Defect Guarantee Released ____ date ____ signature



City of South Por

41 Hutchins Dr.
#2005-0225
receipt of Appl. notice
Sent to 1000'
major SP – IM Zone

1000 0 1000 2000

Map produced by the City of Po
and the GIS Workgroup

Robin Lamb

From: Robin Lamb
Sent: Wednesday, August 29, 2007 9:54 AM
To: 'John Brockington'; 'Philip DiPierro '
Subject: 41 HUTCHINS DRIVE - EASEMENTS GRANTED TO PORTLAND WATER DISTRICT

GENTLEMEN - I AM PUTTING IN THE MAIL A COPY OF THE SIGNED BLOWOFF EASEMENT AND A SIGNED SIDEWALK EASEMENT GIVEN TO PWD BACK IN SEPT. 2006 FOR EACH OF YOUR RECORDS AT JOHN B'S REQUEST. AM MAILING SO YOUR COPIES WILL BE EASILY READ.

PHIL - WOULD YOU BE KIND ENOUGH TO MAKE SURE THAT I GET A COPY OF THE CITY'S LETTER REDUCING THE LOC THAT IS BEING SENT TO BANGOR SAVINGS? APPRECIATE IT !

ADDENDUM NO. 1 TO:

6. STORMWATER MANAGEMENT

The following information should be added to Section 6 Stormwater Management, as submitted to the City of Portland and to the Maine Department of Environmental Protection, on February 23, 2006.

6.4 MAINTENANCE OF STORMWATER SYSTEMS

The following maintenance procedures will be followed for vegetated swales and the subsurface detention structure:

6.4.4 Vegetated Swales

Vegetated swales will be inspected semi-annually in spring and fall. Additionally, vegetated swales will be inspected following major storms. These inspections will ensure that there is no erosion in the swale and that sediment does not build up.

Each vegetated swale will be mowed to a minimum mow height of six inches. Cut vegetation will be removed to prevent the decaying material from adding pollutants to stormwater runoff. Sediment will be removed annually. Any eroding areas will be repaired immediately. Whenever sediment removal or repairs due to erosion are required, the Facilities Manager would likely hire a local contractor to perform this work.

6.4.5 Subsurface Detention Structure

The subsurface detention structure will be inspected semi-annually, in spring and fall, and following major storms through the maintenance port. These inspections will ensure that runoff does not become trapped in the structure and sediment does not build up.

Should runoff become trapped within the structure, attempts will be made to remove blockage from the outlet by either snaking or high pressure water. If these efforts are unsuccessful, a portion of the structure will need to be excavated to remove the blockage within the structure itself. If sediment builds up in the structure, the sediment will be resuspended using high pressure water through the maintenance port. The Facilities Manager would hire a local contractor to perform this work.

6.6 ATTACHMENTS

The following additional attachments have been included with this addendum:

Catch Basin Semi-Annual Visual Monitoring Record

Parking Lot Annual Visual Monitoring Record

Filter Basin Semi-Annual Visual Monitoring Record

Dry Swale Semi-Annual Visual Monitoring Record

Vegetated Swale Semi-Annual Visual Monitoring Record

Subsurface Detention Structure Semi-Annual Visual Monitoring Record

41 HUTCHINS DRIVE
CATCH BASIN
SEMI-ANNUAL VISUAL MONITORING RECORD

CB#: _______ Date:_______________ Time:_____________

Last Date and Approximate rainfall amount:____
Estimated depth of water in sump____

Characteristics of Catch Basin:

Grate Condition____

Outlet Condition____

Sediment Present____

Floatables or Oil Sheen ____

Other Observances ____

____

____

Observations of surrounding drainage area during visual monitoring: ____________________________

____

____

Signature of person conducting visual monitoring:

____ ____________

Name Date

____

Title

41 HUTCHINS DRIVE
PARKING LOT
ANNUAL VISUAL INSPECTION RECORDS

Parking Lot # ______________________________

Date/Time ___________________________________

Weather Conditions ____________________________

Inspector (s) _________________________________

1. Problems observed:

____

____

____

____

____

2. Follow-up actions required following inspection:

____

____

____

____

____

3. Name and title of person(s) notified of inspection results:

_________________________________ ___________

Name Title date

_________________________________ ___________

Name Title date

4. Signature of inspector: ___________________________________

Name Title

____

date

41 HUTCHINS DRIVE
FILTER BASIN
SEMI-ANNUAL VISUAL MONITORING RECORD

Basin location:____________ Date:______________ Time:____________

Last Date and Approximate rainfall amount:____
Estimated depth of Water in basin____

Characteristics of Basin:

Vegetation State____
Sedimentation Present____
Embankment Condition____
Emergency Spillway Condition_____________________________________
Outlet Control Structure Condition__________________________________
Floatables or Oil Sheen ____
Other observances ____
____
____

Observations of basin drainage area during visual monitoring: ______________________
____
____

Signature of person conducting visual monitoring:

____ ___________
Name date

____
Title

41 HUTCHINS DRIVE
DRY SWALE
SEMI-ANNUAL VISUAL MONITORING RECORD

Swale location:____________ Date:____________ Time:____________

Last Date and Approximate rainfall amount:______________________________
Estimated depth of Water in swale____________________________________

Characteristics of Swale:

Vegetation State______________________________
Sedimentation Present______________________________
Embankment Condition______________________________
Emergency Spillway Condition________________________
Outlet Control Structure Condition______________________
Floatables or Oil Sheen ______________________________
Other observances ________________________________

Observations of swale drainage area during visual monitoring: ____________________

Signature of person conducting visual monitoring:

______________________________ ____________
Name date

____
Title

41 HUTCHINS DRIVE
VEGETATED SWALE
SEMI-ANNUAL VISUAL INSPECTION/MAINTENANCE RECORDS

Nearest Unit # ____________________

Date/Time ____________________

Maintenance Person(s) ____________________

1. Type of maintenance required and summary of maintenance activity performed:

____
____
____
____
____
____
____

2. Follow-up actions required as result of maintenance:

____
____
____
____
____
____

3. Name and title of person(s) notified of maintenance activity results:

____________________ ____________
Name Title Date

____________________ ____________
Name Title Date

4. Signature of maintenance person: ____________________
Name Title

____
Date

41 HUTCHINS DRIVE
SUBSURFACE DETENTION STRUCTURE
SEMI-ANNUAL VISUAL MONITORING RECORD

Date:______________ Time:____________

Last Date and Approximate rainfall amount:____

Estimated depth of Water in structure (if any)_____________________________________

Characteristics of Structure:

Sedimentation Present____

Outlet Pipe Condition____

Emergency Outlet Pipe Condition____________________________________

Floatables or Oil Sheen ____

Other observances ____

____

____

Observations of structure drainage area during visual monitoring: ____________________

____

____

Follow-up actions required as result of observations:

____

____

Signature of person conducting visual monitoring:

____ ______________

Name date

____

Title

Blowott

EASEMENT DEED

CIANCHETTE FAMILY, LLC, of Portland, Maine, a Maine limited liability company with a place of business at 42 Market Street, Portland, Maine ("OWNERS") for consideration paid, the receipt whereof is hereby acknowledged, hereby grants to the **PORTLAND WATER DISTRICT**, a public quasi-municipal Maine corporation with a business address of 225 Douglass Street, Portland, Maine ("DISTRICT"), an appurtenant easement on property of the OWNERS in the City of Portland, Cumberland County, Maine, bounded and described as follows:

A strip of land 30 feet wide located easterly of Hutchins Drive in the City of Portland and State of Maine and more particularly described in the attached Exhibit A, incorporated herein by reference.

The DISTRICT shall have the following permanent easement rights in the easement area described above:

1. The right perpetually to install, maintain, replace and remove conduits or pipelines for conveying water, wastewater and/or stormwater, with all necessary fixtures and appurtenances, including electric or other energized control lines through, under and across said property; and

2. The right to flow water from said pipelines from time to time and at such times as the DISTRICT deems necessary to, across and through the 30' private drainage easement on OWNERS property as shown on the proposed site plan done by Woodard and Curran dated January, 2006, on file in the offices of the OWNERS and the DISTRICT.

3. The right to trim, cut down, and/or remove bushes, grass, crops, trees or any other vegetation, to such extent as is necessary for any of the above purposes in the sole judgment of the DISTRICT; and

4. The right to change the existing surface grade of the easement area as is reasonably necessary for any of the above purposes; and

5. The right to enter on the easement area at any and all times for any of the foregoing purposes.

The OWNERS reserve for themselves and their successors and assigns the use and enjoyment of the easement area for any purpose that does not interfere temporarily or otherwise with the use of the easement area by the DISTRICT, its successors and assigns, for its own purposes; provided that none of the following improvements may be made by the OWNERS in the easement area, without the written permission of the DISTRICT:

1. No buildings or any other permanent structures are allowed within the easement area with the exception of pavement and utilities.

EXHIBIT A

A certain strip of land 30 feet in width situated on the easterly sideline of a certain 75 foot wide right of way now of this grantee recorded in the Cumberland County Registry of Deeds in Book 2411 Page 133, said strip being centered 15 feet on each side of a certain centerline, said centerline being described more particularly as follows;

Beginning at a point on the said right of way sideline of at a point 172.4 feet southerly of the southwest corner of Lot 17 as shown on the plan of Stroudwater Estates Phase II recorded in said Registry in Plan Book 153 page 12, said corner being the southwest corner of land now or formerly of Arrow Realty and the northwest corner of land formerly of Cadcam Associates recorded in Book 8170 Page 139 ;

Thence on a bearing S 66°-17' E along the center of a certain blow off pipe as laid for a distance of 21 feet to the end of said blow-off, and continuing on same course beyond the end of said pipe as laid an additional 10 feet to the terminus of the right of way described and conveyed herein.

Portland Water District

225 Douglass Street, PO Box 3553, Portland, ME 04104-3553
(207) 774-5961 x 3057
Fax (207)761-8307
ntwaddel@pwd.org

Fax Transmission

To: Steve Etzel – Cianchette Family LLC - 774-29~~64~~ 46

From: Norman Twaddel

Date: September 13, 2006

Total pages transmitted: 4 (including cover sheet)

Message: Here is an executed copy of the sidewalk easement I delivered yesterday to Penny Littel at the City of Portland. Let me know if you need anything further.

SIDEWALK EASEMENT

In consideration of the payment of One Dollar ($1.00), **PORTLAND WATER DISTRICT**, a quasi-municipal corporation with a mailing address of P.O. Box 3553, Portland, Maine 04104-3553 ("Grantor"), hereby grants to the **CITY OF PORTLAND**, a body politic and corporate with a place of business at 389 Congress Portland, Maine 04101 ("Grantee") a perpetual easement over a strip of land being that portion of a sidewalk (the "Easement Area") along Hutchins Drive in Portland, Maine that extends beyond the street right of way of Hutchins Drive, so-called, on to the Grantor's property. The Easement Area is shown as the cross-hatched area along Hutchins Drive as shown on the Easement Plan made for the City of Portland by Woodard & Curran dated May, 2006 (the "Easement Plan"), a reduced copy of which is attached hereto as Exhibit A. A full-scale copy of the Easement Plan is on file with the City of Portland Planning Department.

The purpose of this easement is for the right to maintain, replace, relocate and repair within the Easement Area a sidewalk up to fifteen (15) feet in width, said sidewalk to be used for pedestrian, bicycle and similar non-motorized (other than wheelchair and emergency vehicles and snow removal equipment which shall be permitted) pedestrian recreational uses by the public, subject, however, to such rules or ordinances which Grantee may adopt from time to time in the interests of public safety.

Grantor further covenants and agrees on behalf of itself, its successors and assigns, that the land which lies within the Easement Area shall, except for the construction, maintenance, repair, relocation and/or replacement of the sidewalk and any appurtenances by Grantee, its successors or assigns shall, as provided and permitted herein, be maintained as a sidewalk for the uses set forth and described herein and Grantor shall not use or permit any use which would be contrary to such condition.

Both Grantor and Grantee acknowledge that this easement is being provided to Grantee for purposes of public pedestrian access and recreation without charge. It is understood that the use herein granted is non-exclusive and that the primary use which Grantor makes of its land (of which the Easement Area is a part) is a private commercial use.

To have and to hold the said Easement and all rights granted hereunder to the said Grantee and its successors and assigns forever.

IN WITNESS WHEREOF, Grantor has caused this easement to be executed by Ronald Miller, General Manager this 12th day of September, 2006.

WITNESS:

PORTLAND WATER DISTRICT

Ronald Miller – General Manager

STATE OF MAINE
County of Cumberland, ss. September 11 , 2006

Personally appeared the above-named Ronald Miller, who acknowledged the foregoing instrument to be his free act and deed and the free act and deed of the Portland Water District..

Before me,

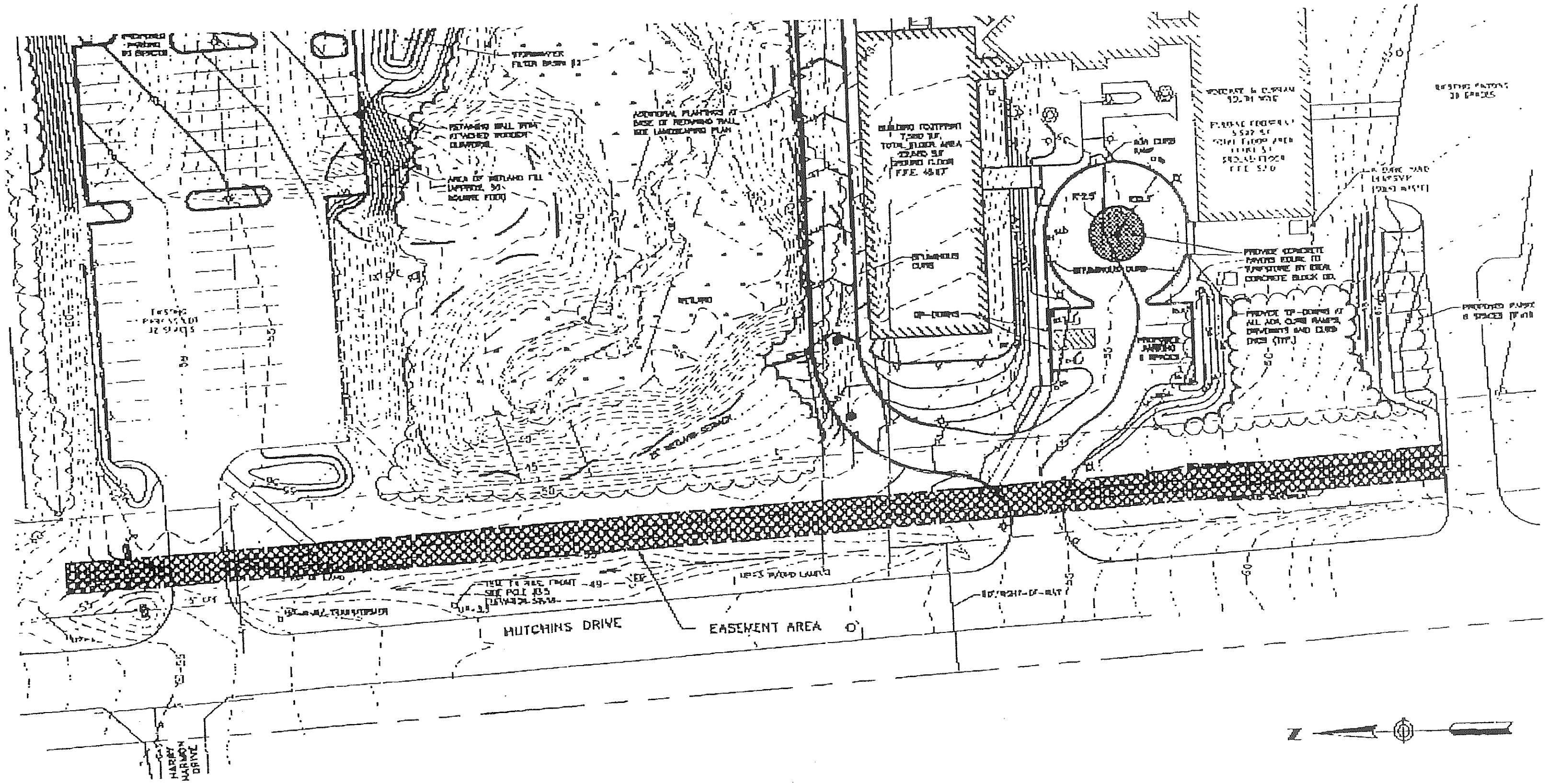
Norman V. Twaddel

Notary Public

Print name:

NORMAN V. TWADDEL
NOTARY PUBLIC, MAINE
MY COMMISSION EXPIRES DECEMBER 17, 2009

EXHIBIT A



NOTE:

THE PROPOSED EASEMENT, TO BE GRANTED BY THE PORTLAND WATER DISTRICT TO THE CITY OF PORTLAND, SHALL BE APPROXIMATELY 623 FEET IN LENGTH AND 15 FEET IN WIDTH. THE EASMENT SHALL FOLLOW THE SIDEWALK (PORTIONS EXISTING AND PORTIONS PROPOSED) LOCATED ALONG THE FRONT OF THE CIANCHETTE FAMILY, LLC PROPERTY. THE EASEMENT SHALL BE CENTERED ON THE SIDEWALK.

50' 0 50' 100'

BAR SCALE
1" = 50'
CHECK GRAPHIC SCALE BEFORE USING

WOODARD & CURRAN
Engineering · Science · Operations

EASEMENT PLAN

CIANCHETTE FAMILY, LLC
PORTLAND, MAINE

WOODARD & CURRAN
OFFICE EXPANSION

JOB NO. 203854.01
DATE: MAY 2006
SCALE: 1"=50'

FIGURE 1

DRAINAGE AND SEWER EASEMENT DEED

KNOW ALL PERSONS BY THESE PRESENTS, that the **CIANCHETTE FAMILY, LLC**, a limited liability company organized under the laws of the State of Maine, for consideration paid, receipt whereof is hereby acknowledged, grants to the **CITY OF PORTLAND**, a body politic and corporate located in Cumberland County, State of Maine, an easement described as follows:

The right perpetually to enter at any and all times upon property situated in Portland, in said County of Cumberland and State of Maine, said property being described in, and as part of Exhibit A, attached hereto and incorporated herein by reference and as further shown on the plan attached as Exhibit B attached hereto and incorporated herein by reference.

> Said easement for the purpose of and conveying the right perpetually to construct and maintain through, under and across said property an access way with all necessary fixtures and appurtenances for installing and maintaining through, under, and across said property, conduits or pipelines with all necessary fixtures and appurtenances for conveying storm water and sewer water and to lay, relay, repair, maintain, clean and remove said storm water and sewer water pipe or pipes upon or under said strips, with all necessary fixtures and appurtenances, together with the right at all times to make connections with said conduits or pipelines to land adjoining said sewer and drainage easement by means of pipes or other services; to trim, cut down and remove trees, bushes, and other vegetation of all kinds, to remove debris and deposits of any kind and to alter and regrade the contours of said easement to such extent as in the sole judgment of the Grantee is necessary or appropriate for any of the above purposes; and to enter upon said easement at any and all times for any of the foregoing purpose, reserving to the Grantor and their successors and assigns the use and enjoyment of said strips and for such purposes only as will in no way interfere temporarily or otherwise with the perpetual use thereof by the Grantee, its successors and assigns for the purpose above mentioned, provided that no building or any kind of permanent structure, including, but not limited to, walls and fences, shall be erected on said strip by the Grantor, their successors or assigns; and that the Grantor, their successors and assigns shall not remove earth from said easement without the written permission of the Grantee, its successors and assigns.

IN WITNESS WHEREOF, THE CIANCHETTE FAMILY, LLC has caused this deed to be signed by Eric Cianchette, its Manager, this 17th day of January, 2007.

WITNESS:

CIANCHETTE FAMILY, LLC

By Eric Cianchette
Its Manager

STATE OF MAINE
CUMBERLAND, ss.

January 17, 2007

Personally appeared the above-named Eric Cianchette as Manager of the Cianchette Family, LLC, and acknowledged the foregoing instrument to be his free act and deed, and the free act and deed of the Company.

Before me,

Notary Public/Attorney-at-Law

Print Name: LORI J. DRESSEL
Notary Public, Maine
My Commission Expires June 11, 2010

SEAL

Exhibit A
Easement Description of Adjusted Location
Cianchette Family, LLC to the City of Portland

A certain parcel of land situated along the northerly sideline of the 30 foot wide easement conveyed from Harry A. Harmon, and George M. Hutchins to the this grantee by deed recorded in the Cumberland County Registry of Deeds in book 3004 page 504, said parcel also situated between stations 14+87.21 and 9+80.91 as shown on a certain plan of the Outer Congress Street Sewage System prepared for the City of Portland Public Works Department by the Hi & E.C. Jordan Company dated May 1967 and revised through June, 1967, said parcel not occupying the entire distance between the above said stations, and being more particularly bounded and described as follows, to wit:

COMMENCING at a point on the northerly sideline of said 30 foot wide right of way, said point being located along the easterly line of a certain 75 foot wide right of way deeded to the Portland Water District recorded in book 2411 page 133, said point on said Water District right of way bearing N 19°-33'-35" W and 312.78' feet northwest of the southwest corner of Lot 15 Phase 2 of Stroudwater Estates as shown on the plan recorded in plan book 153 page 12, and proceeding from the point of Commencement herein
N 75°-31'-40" E 16.30' feet along the northerly line of said 30 foot wide right of way to the **POINT OF BEGINNING**;

THENCE from the **POINT OF BEGINNING** N 62°-45'-55" E 26.90' feet through land of Grantor to a point;

THENCE N 72°-37'-45" E 210.86' feet through land of Grantor to a point;

THENCE S 88°-40'-47" E 75.65' feet through land of Grantor to a point along the northerly line of said 30 foot wide right of way;

THENCE S 76°-26'-47" W 248.45' feet along the northerly line of said 30 foot side right of way to a point at an angle in said right of way and opposite old station 13+29.91 as shown on said Jordan plan;

THENCE S 75°-31'40" W 61.19' feet along the northerly line of said 30 foot side right of way to the **POINT OF BEGINNING**;

Said parcel of land contains three thousand four hundred six square feet (3,406 SF, +/-), more or less.

Bearings referenced herein are Grid North NAD 83(HARN) Maine State Plane West Zone (2 zone system) as determined by a survey plan titled "Plan of Sewer Easement Off Hutchins Drive, Portland, Maine made for Woodard & Curran, Inc. 41 Hutchins Drive, Portland, Maine 04102" dated June 13, 2006, prepared by Royal River Survey Company 43 Marina Road, Yarmouth, Maine to be filed in the City of Portland Public Works Department Engineering Section on record in the DPW Engineering Archives Vault.

Received
Recorded Register of Deeds
Feb 02,2007 03:48:17P
Cumberland County
Pamela E. Lovley

IU - A - e

EROSION AND SEDIMENTATION CONTROL: WOODARD & CURRAN OFFICE EXPANSION

1 PURPOSE

The overall goal of the erosion and sedimentation control plan is to restrict the potential for erosion on the site and the subsequent transfer of sediment to off-site areas and protected resources. Construction of the proposed project has the potential to disturb approximately 2.2 acres of soil, one quarter of which is currently paved areas. This section defines the permanent and temporary measures that will be employed to minimize erosion and sediment removal.

2 OVERVIEW

The construction of the Woodard & Curran Office Expansion will take approximately one year. This document describes the temporary erosion and sedimentation control measures that will be used during construction, and the long-term measures and maintenance procedures that will be used to prevent erosion and sediment removal after construction is complete and the facilities are in use.

3 PROTECTED NATURAL RESOURCE

The protected natural resource associated with the project is the unnamed brook that flows through the middle of the site and into the Stroudwater River. The Stroudwater River is not a water body most at risk from development.

No threatened or endangered species habitat are known to exist at the site; and there are no existing erosion problems.

4 PERMANENT MEASURES

The entire site will be stabilized when the project is complete. Approximately half of the site will be covered with buildings or paved impervious area; the remainder will be graded and landscaped or otherwise revegetated. All swales and slopes will be grassed; further, filtration basin and dry swale spillways, which can be expected to experience higher runoff velocities, will be constructed with soil reinforcement blankets. Pipe outlets will be protected with rip rap aprons or plunge pools. Permanent erosion and sedimentation control measures are indicated on the design Drawings.

The site will be regularly inspected to ensure that surfaces are in good repair and no erosion is occurring. If any area of surface material is damaged and erosion exists, repairs to the surface material will be made immediately to prevent further erosion. After repairs are made, the reason for the damage will be determined and corrected.

The site will be maintained by the property owner. Maintenance will include keeping landscaped areas and stormwater runoff treatment measures functioning as designed, and sweeping paved areas. Storm drain field inlets installed on-site will also be maintained by the property owner.

5 TEMPORARY MEASURES DURING CONSTRUCTION

The area of disturbed soil exposed at any given time during construction will be minimized. The grades are varying and in some cases will change significantly as a result of the project. Erosion and sedimentation control for the site during construction will include the following elements, the locations of which are shown in the design Drawings on Sheet C200 Erosion and Sedimentation Control Plan.

method of filtering the excavation dewatering water will be designed to meet the expected dewatering flow rate, the fabric strength and permeability.

Sediment captured in the dewatering filter measures will be removed at the interval recommended by the manufacturer of the product utilized. Filtered water will be discharged to a stabilized area and will ultimately flow to the storm drain system.

6 SCHEDULING

Scheduling of specific construction activities, including installation of erosion and sedimentation control measures, will be used to minimize both the amount of soil exposed at the site at any given time and the sediment transfer.

The following erosion and sedimentation control measures will be installed prior to commencing earthwork activities:

- Construction entrance,
- Sediment berms and siltation fencing, and
- Catch basin inlet protection.

Proposed stormwater management structures will be installed and put into operation as soon as practical at the beginning of construction. If stormwater runoff from any work area will flow directly into the wetland or brook, a sediment barrier must be installed down-slope of the work area prior to commencement of any excavation in that work area. Inlets to the new storm drain structures must be provided with sediment protection. Installing and using permanent erosion and sedimentation control mechanisms as soon as practicable will minimize the number of temporary sediment barriers.

The primary erosion and sedimentation control measures, such as the construction entrance and the sediment berms and siltation fencing, will be installed prior to winter construction. All vegetated disturbed areas will be seeded, winter mulched or both.

7 MAINTENANCE DURING CONSTRUCTION

The Contractor will be required to perform regular maintenance at the site. Regular inspections of the site and erosion and sedimentation control facilities will be made by a representative of the Owner and the Contractor. Inspections will be made daily. Repairs will be made in a timely manner. At a minimum, the inspections will include the items listed in Table 1 below.

STORMWATER EROSION & SEDIMENTATION CONTROL INSPECTION REPORT FORM

Inspectors:

Date: ___ / ___ / _____
Time:________a.m./p.m.
Temperature:_______°F

________________________ of ________________________ (Project Owner)
________________________ of ________________________ (Contractor)
________________________ of ________________________
________________________ of ________________________

Storm Event? ☐ Yes ☐ No Rainfall Amount _______ Storm Duration _______ hours

Visual Observations of Activity and Site Conditions:

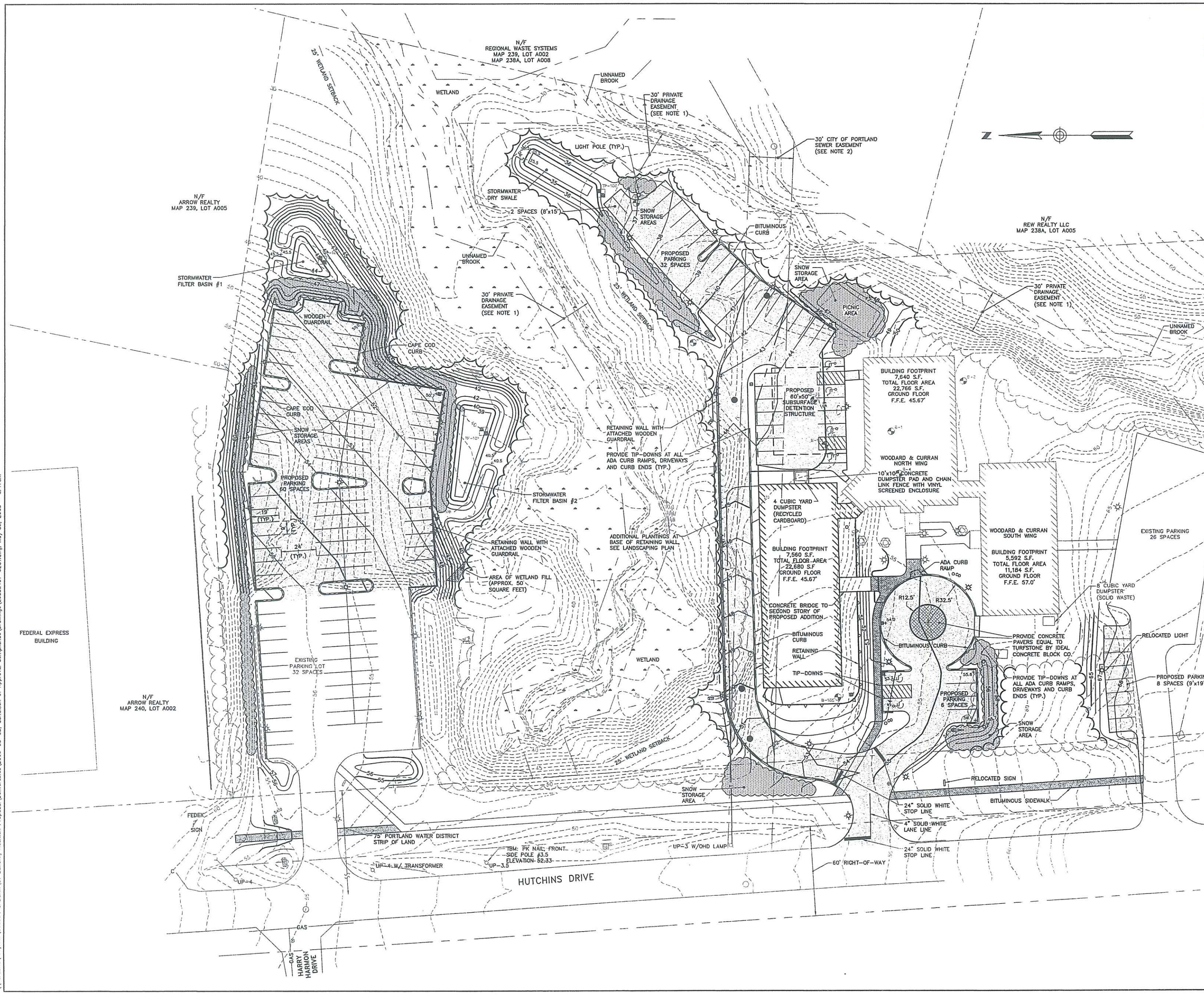
Disturbed Soil Areas: ____
____
____
____
____

Storage Of Soils: ____
____
____
____
____

Sediment & Erosion Control Measures: ____
____
____
____
____

Construction Site Entrance: ____
____
____
____
____
____

Surface Stabilization: ____
____
____
____
____
____



SNOW REMOVAL AND MAINTENANCE:

SNOW REMOVAL FROM THE 20-FOOT WIDE ACCESS DRIVE, FROM HUTCHINS DRIVE TO THE PARKING AREA AT THE REAR OF THE PROPOSED ADDITION, WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER:

- SNOW ON THE EASTBOUND LANE OF THE ACCESS DRIVE WILL BE PLOWED TO THE REAR OF THE ADDITION AND STORED IN THE PICNIC AREA BEHIND THE PARKING LOT.
- SNOW ON THE WESTBOUND LANE OF THE ACCESS DRIVE WILL BE PLOWED TO THE FRONT OF THE ADDITION AND STORED BETWEEN THE ACCESS DRIVE AND THE SIDEWALK.
- NO SNOW WILL BE STORED BETWEEN THE ACCESS DRIVE AND THE BUILDING, ENSURING A 20-FOOT WIDE ACCESS DRIVE DURING ALL SEASONS.

NOTES:

1. PRIVATE DRAINAGE EASEMENTS TO BE TRANSFERRED TO CITY OF PORTLAND.
2. 30' SEWER EASEMENT TO BE RELOCATED TO 15' ON EITHER SIDE OF RELOCATED SEWER MAIN, AS AGREED TO BY LOT OWNER AND CITY OF PORTLAND DEPARTMENT OF PUBLIC WORKS.
3. THE APPLICANT SHALL ADHERE TO THE INSPECTION AND MAINTENANCE PROCEDURES FOR ALL STORMWATER MANAGEMENT DEVICES SET FORTH IN THE STORMWATER MANAGEMENT PLAN AND ADDENDUM, AND TO THE EROSION AND SEDIMENTATION CONTROL PLAN, INCLUDING PLAN C200.
4. THE APPLICANT SHALL ADHERE TO THE GEOTECHNICAL REPORT, AS PREPARED BY S.W. COLE ENGINEERING, INC., AND DATED FEBRUARY 8, 2006, DURING CONSTRUCTION AND WILL INVOLVE THE GEOTECHNICAL ENGINEER AT REGULAR INTERVALS DURING THE CONSTRUCTION OF THE FOUNDATIONS AND RETAINING WALLS. THE FINAL RETAINING WALL DESIGN SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER AND REVIEWED AND APPROVED BY THE CODE ENFORCEMENT OFFICER, THE DEVELOPMENT REVIEW COORDINATOR AND THE GEOTECHNICAL ENGINEER.

30' 0 30' 60'
BAR SCALE
1" = 30'
CHECK GRAPHIC SCALE BEFORE USING

WOODARD & CURRAN
Engineering · Science · Operations
PORTLAND, MAINE 800-426-4262

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STATE OF MAINE
KENNETH R. VOLOCK
11062
REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE
2	CONDITIONS OF APPROVAL COMPLIANCE	5/05/06
1	SUBMITTED FOR PLANNING BOARD APPROVAL	3/08/06
-	SUBMITTED FOR PLANNING BOARD APPROVAL	2/22/06

DESIGNED BY: JBC/KRV CHECKED BY: BSS/KRV
DRAWN BY: JBC 20383401-C201.dwg

PROPOSED SITE PLAN

CAD-CAM ASSOCIATES
PORTLAND, MAINE

WOODARD & CURRAN INC.
OFFICE EXPANSION
41 HUTCHINS DRIVE, PORTLAND, ME

JOB NO.: 203834.01
DATE: MARCH 2006
SCALE: AS NOTED
SHEET: OF -

C201

WOODARD & CURRAN
Engineering • Science • Operations

CORPORATE OFFICES: Maine, Massachusetts,
New Hampshire, New York, Connecticut, Florida
Operational offices throughout the U.S.

May 5, 2006

Jean Fraser, Planner
City of Portland
389 Congress Street
Portland, ME 04101

Re: Woodard & Curran Building Addition
Major Site Plan Review – Condition of Approval Compliance

Dear Jean:

On behalf of the joint applicants, CADCAM Associates and Peggy and Eric Cianchette, we are submitting additional information in support of the Major Site Plan Application for the Woodard & Curran Building Addition, originally submitted September 21, 2005, and approved by the Planning Board on March 14, 2006. The information that follows includes updated plans, a permit approval letter and draft easement language, provided in support of compliance with Conditions of the Planning Board Approval.

The following conditions of approval were set forth in the Planning Board Approval Letter, dated March 28, 2006. Responses have been organized in order of the conditions of approval.

<u>Condition i</u>: That the applicant receives the required permits from the MDEP prior to the issuance of a building permit or any site work alterations.

<u>Response:</u>

MeDEP approval was received on April 3, 2006. A hardcopy of the permit documents has been included with this submission.

<u>Condition ii</u>: That the applicant shall contribute $5,000 to an account that would be used to fund traffic improvements to the intersection at Hutchins Drive/Congress Street. If part or all of the contribution remains unused, or is determined not to be required after ten years, the unexpended portion of the contribution funds shall be returned to the applicant.

<u>Response:</u>

In our phone conversation yesterday, you indicated that there was a City form that accompanies this contribution. The contribution will be made once the accompanying form has been received from your office.

<u>Condition iii</u>: The applicant shall submit a Snow Removal and Maintenance Plan for the 20 foot wide roadway adjacent to the new building to the satisfaction of the Traffic Engineer and the Development Review Coordinator (Jim Seymour of Sebago Technics). The Snow Removal and Maintenance Plan to show how this access will be maintained and kept free of obstructions to ensure fire access if needed.

WOODARD & CURRAN
Engineering • Science • Operations

Response:

Snow storage areas have previously been indicated on Sheet C201 Proposed Site Plan. A note describing snow removal and maintenance from the access drive has been added to the Plan. The revised Sheet C201 Proposed Site Plan has been included with this submission.

Condition iv: The applicant shall adhere to the Inspection and Maintenance Procedures set out in the Stormwater Management Addendum submitted for the subsurface detention structure and vegetated swale, and the Erosion and Sedimentation Control Plan (including Plan C200) submitted February 23, 2006.

Response:

A note requiring compliance with the Inspection and Maintenance Procedures set forth in the Stormwater Management Plan and the Addendum, as well as the Erosion and Sedimentation Control Plan, has been added to Sheet C201.

Condition v: The applicant shall present the sidewalk, drainage and sewer easements for final review and approval by Corporation Counsel, including evidence of an appropriate easement in relation to the water main blow-off valve discharge pipe.

Response:

A draft sidewalk easement, prepared by the Portland Water District has been submitted for the City's review. A copy of the draft easement has been included with this submission. We are awaiting word on the required width of the easement from the City to complete the figure referenced in the draft easement.

Draft language for the drainage easement is being prepared for the City's review. We are awaiting final word on whether the City is interested in the drainage easement associated with the small brook along the eastern edge of the property, or only in the drainage easement associated with the larger brook running through the center of the site.

Draft language and a Plan for the relocated sewer easement have been submitted for the City's review. A copy of the draft language and the plan has been included in this submission.

The Portland Water District will be inspecting the water main blow-off in question on Monday, May 8, 2006, to determine whether an easement is required. As has been stated in earlier submissions, the blow-off is located on land that is unaffected by the proposed development.

Condition vi: The applicant shall submit details of the sidewalk extension and sewer diversion, which must be in accordance with the City Standards and directly reviewed and approved by Public Works.

Response:

Typical sewer details have previously been indicated on Sheet C300 Civil Details – 1, and a detail showing typical sidewalk construction in accordance with City design standards has previously been indicated on Sheet C301 Civil Details – 2. The typical trench detail on Sheet C300 has been revised to indicate 12" of crushed stone over the pipe instead of 6" as had been previously indicated. All other applicable details are in accordance with City standards. Revised copies of both detail sheets have been included with this submission.

<u>Condition vii</u>: *The applicant to adhere to the submitted Geotechnical Report during construction and involve a Geotechnical Engineer at regular intervals during the construction of foundations and retaining walls; also to amend the plans to reference the construction measures required for such foundation and retaining wall construction. The final retaining wall design shall be designed by a professional engineer and reviewed and approved by the code enforcement officer and the Development Review Coordinator.*

<u>Response:</u>

The Geotechnical Report shall be adhered to in preparing final design of the proposed project. Additionally, a copy of the report will be included in the construction specifications. S.W Cole will be enlisted to review final design documents to ensure the recommendations presented in the Geotechnical Report have been met as applicable. Construction monitoring and testing will be incorporated into the final construction documents. A note requiring compliance with the above condition has been added to Sheet C201.

<u>Potential Condition viii</u>: *The applicant shall discuss and agree with Staff an alternate treatment of the central are of the turning circle at the main entrance.*

<u>Response:</u>

The applicant proposes to use the Turfstone product at the center of the entrance plaza. The product chosen must be able to withstand periodic traffic and must not present any impediment. During some conversations, a tree was suggested at the center of the entrance plaza. Woodard & Curran evaluated the possibility of placing a tree at the center of the plaza; however, the used of the entire circular area by larger delivery trucks prohibits the placement of a tree or any other impediment.

The Turfstone product was chosen because the concrete structure would support traffic loads as well as protect the grass that grows in the openings. Other products investigated were GrassPave and GravelPave, both by Invisible Structures. GrassPave did not appear to provide support required for the type of traffic that would drive over it, and GravelPave would provide no green space; therefore, neither was preferable when compared to the Turfstone product.

<u>Condition ix</u>: *That in view of the sensitive nature of this site and its proximity to wetland areas, as a condition of this approval there shall be no further expansion or development of parking areas or commercial space outside of the existing building footprint or impervious surface areas approved herein.*

<u>Response:</u>

Through our phone conversation yesterday, it is our understanding that this condition is documented in the records and requires no further action on our part.

<u>Condition x</u>: *The applicants represented that the purchase and sale agreement has been extended, and shall submit a copy of the extended agreement evidencing that the contract is still in effect by Friday this week (March 17, 2006).*

WOODARD & CURRAN
Engineering • Science • Operations

Response:

The applicable documents were submitted to the City by Friday March 17, 2006, in accordance with the condition. No further action on the part of the applicant is required.

Jim Seymour, P.E., of Sebago Technics, Inc., and Captain Greg Cass, of the Portland Fire Department, have been copied on this letter so they may confirm that our Snow Removal and Maintenance Plan is acceptable for the 20-foot wide access drive. Eric Labelle, P.E., of the Portland Public Works Department, has been copied to confirm the sewer and sidewalk details are in conformance with Portland standards. Jeff Tarling, the City Arborist, has been copied to confirm the use of the Turfstone product at the center of the entrance plaza will be acceptable.

Thank you for the assistance you have provided on this project. If you have any questions or comments, please do not hesitate to contact me at (207) 797-7515, or via email, kvolock@woodardcurran.com.

Sincerely,
WOODARD & CURRAN INC.

Kenneth Volock, P.E.
Engineer

STATE OF MAINE
KENNETH R. VOLOCK
NO. 11062
REGISTERED PROFESSIONAL ENGINEER

KRV/
203834.01

Cc: Eric Labelle, P.E., City of Portland
Jeff Tarling, City of Portland
Captain Greg Cass, City of Portland Fire Department
Jim Seymour, P.E., Sebago Technics, Inc.

Enclosures: Maine Department of Environmental Protection permit approval, including: cover letter; DEP Information Sheet; and Findings of Fact and Order
Draft Sidewalk Easement as prepared by the Portland Water District
Draft description for the relocated Sewer Easement, with Plan, as prepared by Royal River Survey Co.
Drawings, revised May 5, 2006, including:
C201 Proposed Site Plan
C300 Civil Details – 1
C301 Civil Details – 2

Kenneth Volock

From: Tim Boyce [tboyce@swcole.com]
Sent: Monday, July 10, 2006 10:12 AM
To: 41hutchins@alliedcook.com
Cc: Kenneth Volock
Subject: W&C Bldg Addition_MSE Wall submittal

Bill / Kenny,

Have reviewed MSE Wall submittal dated 7-6-06 relative to geotechnical aspects and made global stability analysis. Based on our review and analysis, we recommend that submitall be approved.

As discussed with Rod Coleman, we plan to hand deliver the submittal to Allied Cooks contruction trailer at the site this afternoon.

Trust this meets your needs. Please call if questions.

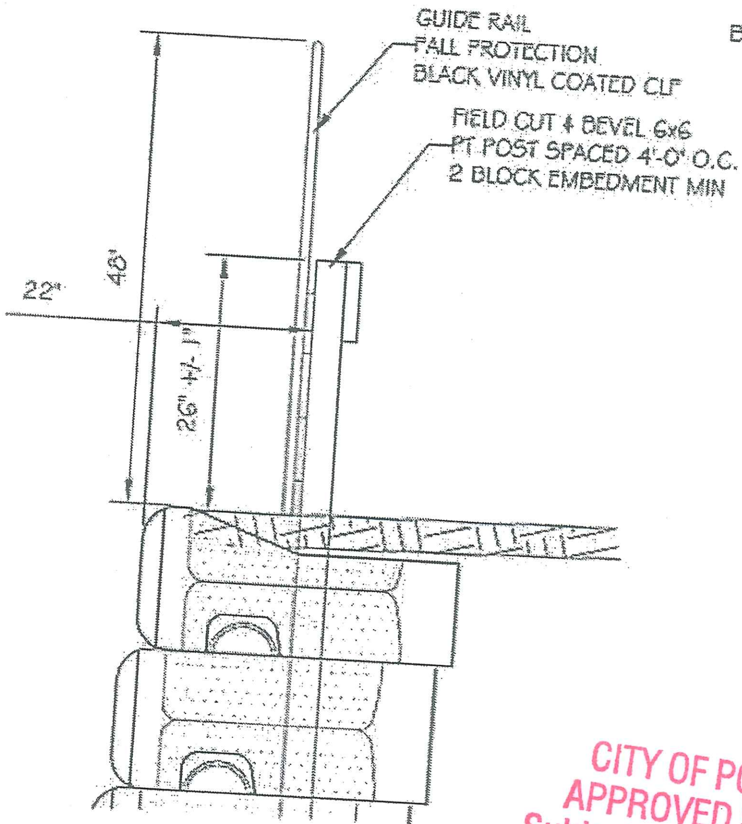
S/ Tim

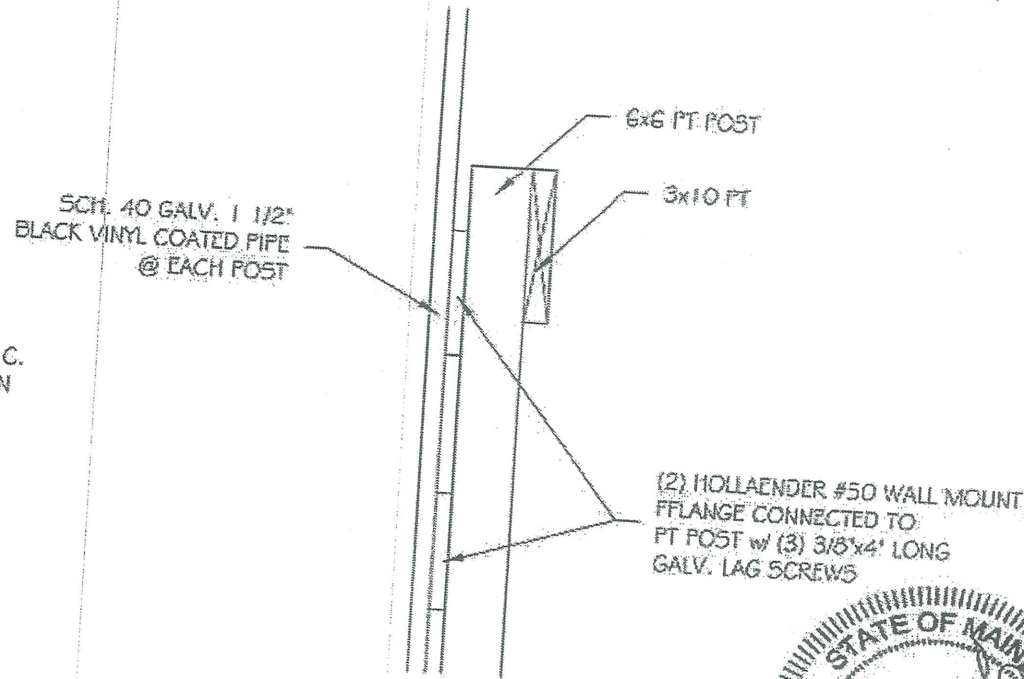
Timothy J. Boyce, P.E.
Senior Geotechnical Engineer

S. W. Cole Engineering, Inc.
286 Portland Rd
Gray, ME 04039
Tel (207) 657-2866
Fax (207) 657-2840
www.swcole.com

CITY OF PORTLAND
APPROVED SITE PLAN
Subject to Dept. Conditions
Date of Approval: 8-25-2006

#2006-0120





STATE OF MAINE
JAMES A. THIBODEAU
NO. 5795
REGISTERED
PROFESSIONAL ENGINEER

NOTES:

GUIDE RAIL FALL PROTECTION DESIGNED TO RESIST 200LB POINT LOAD LOCATED AT TOP OF RAIL

3/8" LAG SCREWS DESIGNED TO RESIST 880LB PULL OUT LOAD FROM GUIDE RAIL

CITY OF PORTLAND
APPROVED SITE PLAN
Subject to Dept. Conditions
Date of Approval: 8-25-2006
2006-0120

ASSOCIATED DESIGN PARTNERS INC.
80 Leighton Road
Falmouth, Maine 04105
Office: (207) 878-1751
Fax: (207) 878-1788
E-Mail: adp@adpengineering.com

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PROJECT: WOODARD & CURRAN II

FOR: ALLIED COOK

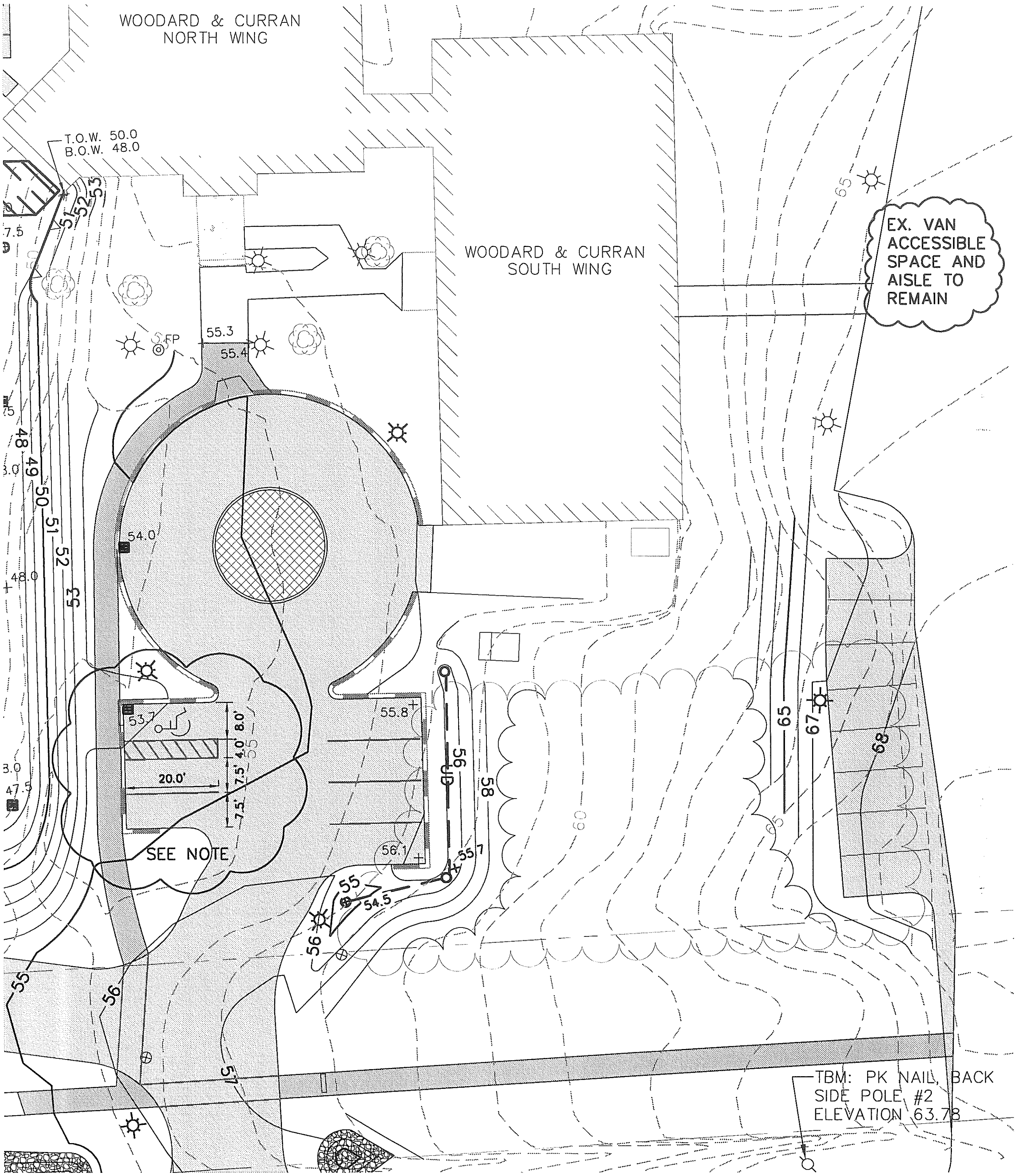
SHEET TITLE:

GUIDE RAIL FALL PROTECTION
DETAIL

REVISIONS

No.	BY	DESCRIPTION	DATE
△			
△			
△			
△			

DATE : 8-03-06
SCALE : NTS
DESIGN BY: JAT
DRAWN BY: NR
FILE: 06221-RAIL.DWG
PROJECT NUMBER: 06221
SHEET NO: S1



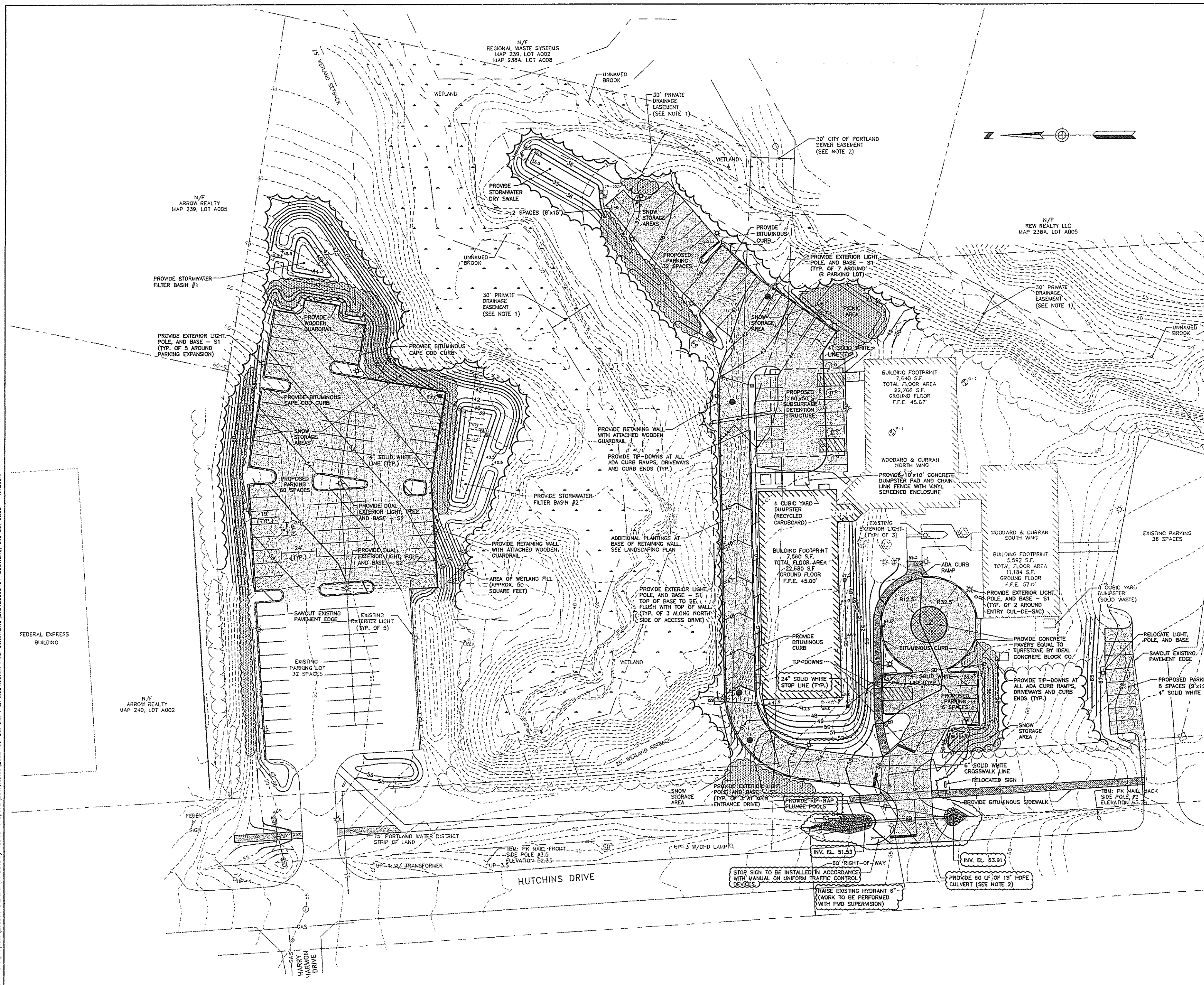
30' 0 30' 60'

BAR SCALE
1" = 30'
CHECK GRAPHIC SCALE BEFORE USING

NOTE:

PROVIDE 1 ACCESSIBLE SPACE, 2 COMPACT SPACES, AND AISLE. VAN ACCESSIBLE SPACE TO BE REMOVED AND LOCATED AS CURRENTLY STRIPED AT SOUTH WING PARKING LOT.

WOODARD & CURRAN Engineering · Science · Operations PORTLAND, MAINE 800-426-4262	ENTRY LOOP VISITOR PARKING STRIPING MODIFICATIONS DESIGNED BY: BSS / CHECKED BY: BSS DRAWN BY: BSS / 20383401-SKC7.dwg	CIANCHETTE FAMILY, LLC PORTLAND, MAINE WOODARD & CURRAN OFFICE EXPANSION	JOB NO: 203834.02 DATE: JUNE 2007 SCALE: 1"=30' SKC-07



SNOW REMOVAL AND MAINTENANCE:

SNOW REMOVAL FROM THE 20-FOOT WIDE ACCESS DRIVE, FROM HUTCHINS DRIVE TO THE PARKING AREA AT THE REAR OF THE PROPOSED ADDITION, WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER:

- SNOW ON THE EASTBOUND LANE OF THE ACCESS DRIVE WILL BE PLOWED TO THE REAR OF THE ADDITION AND STORED IN THE PICNIC AREA BEHIND THE PARKING LOT.
- SNOW ON THE WESTBOUND LANE OF THE ACCESS DRIVE WILL BE PLOWED TO THE FRONT OF THE ADDITION AND STORED BETWEEN THE ACCESS DRIVE AND THE SIDEWALK.
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NOTES:

1. PRIVATE DRAINAGE EASEMENTS TO BE TRANSFERRED TO CITY OF PORTLAND.
2. 30' SEWER EASEMENT TO BE RELOCATED TO 15' ON EITHER SIDE OF RELOCATED SEWER MAIN, AS AGREED TO BY LOT OWNER AND CITY OF PORTLAND DEPARTMENT OF PUBLIC WORKS.
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30' 0 30' 60'
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CHECK GRAPHIC SCALE BEFORE USING

WOODARD & CURRAN
Engineering · Science · Operations
PORTLAND, MAINE 800-426-4262

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KENNETH R. VOLOCK 11062

REV	DESCRIPTION	DATE
2A	SITE PLAN MOD. RESPONSE TO FINAL COMMENTS	09/29/06
2	SITE PLAN MODIFICATION APPLICATION	09/15/06
1	SITE PLAN MODIFICATION APPLICATION	06/19/06
-	ISSUED FOR CONSTRUCTION	05/22/06

DESIGNED BY: JBC/KRV CHECKED BY: BSS/KRV
DRAWN BY: JBC 20383401-C201.dwg

PROPOSED SITE PLAN

CAD-CAM ASSOCIATES
PORTLAND, MAINE

WOODARD & CURRAN INC.
OFFICE EXPANSION
41 HUTCHINS DRIVE, PORTLAND, ME

JOB NO.: 203834.01
DATE: MAY 2006
SCALE: AS NOTED
SHEET: OF -

C201

City of Portland
Department of Planning and Development
Planning Division
389 Congress Street, 4th Floor
Portland ME 04101
(207)874-8721 or (207)874-8719
Fax: (207)756-8258

RESURGAM. CITY OF PORTLAND, MAINE

FAX

To: Robin Lamb

Company: The Regency

Fax #: 774-2946

Date: 5/10/07

From: Phil DiPierro

You should receive 2 page(s) including this cover sheet.

Comments:

PG Reduction letter to follow

Phil

MODE = MEMORY TRANSMISSION START=MAY-10 16:58 END=MAY-10 16:59

FILE NO.=186

STN NO.	COMM.	ABBR NO.	STATION NAME/TEL NO.	PAGES	DURATION
001	OK	☎	97742946	002/002	00:00:35

-CITY OF PORTLAND -

************************************ -PLANNING DEPT. - ***** - 2077568258- *********

City of Portland
Department of Planning and Development
Planning Division
389 Congress Street, 4th Floor
Portland ME 04101
(207)874-8721 or (207)874-8719
Fax: (207)756-8258

RESURGAM CITY OF PORTLAND, MAINE

FAX

To: Robin Lamb

Company: The Regency

Fax #: 774-2946

Date: 5/10/07

From: Phil DiPierro

You should receive 2 page(s) including this cover sheet.

Comments:

PG Reduction letter to follow

Phil

Finance Department
Duane G. Kline, Director

May 8, 2007

Bangor Savings Bank
280 Fore Street, Suite 200
Portland, ME 04101

Re: Performance Guarantee – Cianchette Family, LLC – 41 Hutchins Drive
Letter of Credit No. 176 dated May 15, 2006

This is to inform you that I am authorizing the reduction in the above-named letter of credit by the amount of $260,353.00, which leaves a balance of $66,740.00 remaining.

If you require any further information, please let me know.

Sincerely,

Duane G. Kline
Finance Director

DGK:mma

cc: Barbara Barhydt, Development Review Services Manager
Philip DiPierro, Development Review Coordinator

Planning and Development Department
Lee D. Urban, Director

Planning Division
Alexander Jaegerman, Director

TO: Duane Kline, Finance Department

FROM: Alexander Jaegerman, Planning Division Director

DATE: May 3, 2007

SUBJECT: Request for Reduction of Performance Guarantees
Woodard & Curran Addition, 41 Hutchins Drive
(ID# 2005-0225) (Lead CBL#238A A 1; 239 A 4)
(Cianchette Family LLC)

Please reduce the letter of credit #176 for the Woodard & Curran Building Addition.

Original Amount	$327,093.00
This Reduction	**$ 260,353.00**
Remaining Balance	$ 66,740.00

This is the first reduction for the project.

Approved: Alexander Ja

Alexander Jaegerman
Planning Division Director

cc: Barbara Barhydt, Development Review Services Manager
Philip DiPierro, Development Review Coordinator
File: Urban Insight

O:\PLAN\DRC\Projects\Hutchins 41\PG Reduction Letter.doc

CIANCHETTE FAMILY, LLC. (Owner)

WOODWARD & CURRAN NEW BUILDING 41 HUTCHINS DR, PORTLAND (Project)

BREAKDOWN OF LETTER OF CREDIT #176 FROM BANGOR SAVINGS BANK
TO CITY OF PORTLAND, MAINE DATED MAY 15, 2006

Item Description	Original Amount	Completed 3/19/2007	Balance Finish
Roads, parking areas:	$ 152,670.00	$ 118,192.00	$ 34,478.00
Curbing	$ 2,862.00		$ 2,862.00
Sewer-manholes	$ 6,000.00	$ 6,000.00	
Sewer-piping	$ 46,341.00	$ 46,341.00	
Storm-catch basins	$ 4,400.00	$ 4,400.00	
Storm-piping	$ 17,709.00	$ 17,709.00	
Storm-basins	$ 40,460.00	$ 40,460.00	
Site lighting	$ 20,951.00	$ 20,951.00	
Erosion-silt fence	$ 3,900.00	$ 3,900.00	
Erosion-level lip spreader	$ 2,000.00	$ 2,000.00	
Erosion-basin inlet protection	$ 400.00	$ 400.00	
Landscape	$ 29,400.00	$ -	$ 29,400.00
TOTAL	$ 327,093.00	$ 260,353.00	$ 66,740.00

4/258/2007

CIANCHETTE FAMILY LLC
Eric and Peggy Cianchette
42 Market Street
Portland, Maine 04101

Tel. 774-1000

RECEIVED
APR 20 2007
DEPT OF ASSESSOR
CITY OF PORTLAND, ME

Philip DiPierro
Development Review Coordinator
City of Portland
389 Congress Street
Portland, Maine 04101

April 17, 2007

Re: Woodard & Curran Building Addition
41 Hutchins Drive, Portland - Project Job #203834.1

Dear Mr. DiPierro:

The City holds a Letter of Credit #176 issued 5/15/06 by Bangor Savings Bank in the amount of $327,093.00 on the above project. The project is now substantially complete (with a temporary C.O. being issued 3/14/07) and the Cianchettes would like to request that the Letter of Credit be reduced to an appropriate amount to cover the few items that remain to be completed. I have enclosed a copy of the original cost estimate breakdown and a list given to us by Allied Cook dated March 19, 2007 showing what remains to be done.

Thank you for your response to this request and please contact me directly if there is anything further I can provide you with.

Yours truly,

Robin Lamb

Robin Lamb

Email: rlamb@theregency.com

41 Hutchins Drive
Things To Do
March 19, 2007

Allied/Cook Construction

1. Put up 41 Hutchins Drive sign, which is out behind the building.

R.E. Coleman

1. Clean up wood and miscellaneous.
2. Strip formwork off slabs.
3. Take down all snow fence and clean-up.
4. Cut in all planters in both parking lots.
5. Put in radius brick planters.
6. New curb & pavement.
7. Bark mulch top at both retaining walls.
8. Re-stripe.
9. Make sure all lip spreaders are completed.
10. Loam & seed.
11. Landscape.

FROM : RE COLEMAN FAX NO. : 7973742 May. 11 2006 07:10AM P2

ALLIED COOK CONSTRUT PAGE 02/03

.006 08:25 2078866138

Planning and Development Department
SUBDIVISION/SITE DEVELOPMENT

COST ESTIMATE OF IMPROVEMENTS TO BE COVERED BY PERFORMANCE GUARANTEE

Date ______

Name of Project: Woodland and Curran

Address/Location: 41 Hutchins Drive, Portland, Maine

Developer : Allied/Cook Construction

Form of Performance Guarantee: ______

Type of Development: Subdivision ______ Site Plan (Major/Minor) ______

TO BE FILLED OUT BY APPLICANT:

Item	PUBLIC Quantity	PUBLIC Unit Cost	PUBLIC Subtotal	PRIVATE Quantity	PRIVATE Unit Cost	PRIVATE Subtotal
1. STREET/SIDEWALK						
Road/Parking Areas				2		$ 152,670.00
Curbing				159	18	$ 2,862.00
Sidewalks						
Esplanades						
Monuments						
Street Lighting						
Street Opening Repairs						
Other						
2. EARTHWORK						
Cut						
Fill						
3. SANITARY SEWER						
Manholes				4	1,500	$ 6,000.00
Piping				550		$ 46,341.00
Connections						
Main Line Piping						
House Service Piping						
Pump Stations						
Other						
4. WATER MAINS				None		
5. STORM DRAINAGE						
Manholes				None		
Catchbasins				4	1,100	$ 4,400.00
Piping				720		$ 14,709.0
Detention Basin				3		$ 40,459.7
Stormwater Quality Units				1		
Other						

Item	PUBLIC Quantity	PUBLIC Unit Cost	PUBLIC Subtotal	PRIVATE Quantity	PRIVATE Unit Cost	PRIVATE Subtotal
6. SITE LIGHTING				9		$ 20,951.12
7. EROSION CONTROL						
Silt Fence				1,400	$	3,900.00
Check Dams						
Pipe Inlet/Outlet Protection				2	1,000	2,000.00
Level Lip Spreader						
Soil Stabilization						
Geotextile						
Hay Bale Barriers				4	100	400.00
Catch Basin Inlet Protection						
8. RECREATION AND OPEN SPACE AMENITIES						
9. LANDSCAPING (Attach breakdown of plant materials, quantities, and unit costs)				$ 327,093,		29,400.00
10. MISCELLANEOUS				Foundation + Backfill		$ 126,826.10
TOTAL:			$			$ 424,519
GRAND TOTAL:						$ 453,919.00

INSPECTION FEE (to be filled out by City)

		PUBLIC	PRIVATE	TOTAL
A:	2.0% of totals:			6541.86
	or			
B:	Alternative Assessment:			
	Assessed by:	(name)	(name)	

41 Hutchins Drive
Things To Do
March 19, 2007

Allied/Cook Construction

1. Put up 41 Hutchins Drive sign, which is out behind the building.

R.E. Coleman

1. Clean up wood and miscellaneous.
2. Strip formwork off slabs.
3. Take down all snow fence and clean-up.
4. Cut in all planters in both parking lots.
5. Put in radius brick planters.
6. New curb & pavement.
7. Bark mulch top at both retaining walls.
8. Re-stripe.
9. Make sure all lip spreaders are completed.
10. Loam & seed.
11. Landscape.

Received 3/26/07 from John Brockington
at Allied.

attach to approval letter

GEOTECHNICAL ENGINEERING SERVICES
PROPOSED BUILDING ADDITION AND
PARKING LOT EXPANSION
WOODARD & CURRAN OFFICES
41 HUTCHINS DRIVE
PORTLAND, MAINE

05-1126 **February 8, 2006**

PREPARED FOR:
Woodard & Curran, Inc.
Attention: Kenneth Volock
41 Hutchins Drive
Portland, Maine 04102

PREPARED BY:

S.W.COLE
ENGINEERING, INC.

286 Portland Road
Gray, Maine 04039

TABLE OF CONTENTS

05-1126

February 8, 2006

Woodard & Curran
Attention: Kenneth Volock
41 Hutchins Drive
Portland, Maine 04102

Subject: Geotechnical Engineering Services
Proposed Building Addition and Parking Lot Expansion
Woodard & Curran Offices
41 Hutchins Drive
Portland, Maine

Dear Kenny:

In accordance with our Agreement dated October 17, 2005, we have made a subsurface investigation for the proposed building addition and parking lot expansion at the Woodard & Curran Offices at 41 Hutchins Drive in Portland, Maine. The purpose of our work was to obtain subsurface information in order to provide geotechnical recommendations for foundations and earthwork associated with the proposed construction. A draft report was provided to Woodard & Curran on January 5, 2006 for review and comment. This report presents our findings and recommendations. The contents of this report are subject to the limitations set forth in Attachment A.

1.0 INTRODUCTION

1.1 Scope of Work

Our scope of work included a review of previous explorations coordinated by Woodard & Curran in 1995 for a previous building addition, six test boring explorations, geotechnical laboratory testing, a geotechnical evaluation of the subsurface findings relative to the proposed construction and preparation of this report. It should be noted that our scope of work was modified and expanded to include additional explorations, testing and analysis, as requested by Woodard & Curran, to accommodate a change in the site plan which included a new location for the building addition that was made after our initial explorations and laboratory testing had been completed.

1.2 Proposed Construction

At the time of our agreement and during our first phase of drilling in October, 2005, we understand development plans called for construction a 7,500 SF, three-story office wing on the northeast side of the existing Woodard & Curran Office building and expansion of the northern satellite parking lot at the facility. The ground floor of the building addition was to be an unheated car parking level at a finished floor elevation of 45.67 feet (project datum) and the upper two floors of the building addition were to be heated office space.

Based on the revised site plans provided, we understand the proposed building addition will be a 7,560 SF, three-story structure situated on the northwest side of the existing building. We anticipate the proposed building will be steel-framed with a brick veneer. All three stories will be enclosed office space and the ground floor has a proposed slab-on-grade at an elevation of about 45.7 feet. Based on the site plans, we understand existing grades within the proposed building addition range from about elevation 45 to 51 feet, requiring a tapered cut approaching 6 feet to establish finished slab grade.

A paved access drive will be constructed along the northerly edge of the proposed building to access an expanded parking area on the northeast side of the existing structures. The new access drive will be situated over an existing slope requiring tapered fills approaching 9 feet in height. We understand that a retaining wall approaching 9 feet in height and approximately 360 feet in total length will be placed along the northerly edge of the new access drive. Based on the topographic information provided, we anticipate that this retaining wall will have negative foreslopes approaching 6 feet in height at an inclination as steep as 1H:1V.

The proposed northern parking lot expansion includes construction of new parking spaces, two stormwater filter basins, cuts approaching 9 feet and fills approaching 11 feet. A new site retaining wall approaching 8 feet in height will retain the fill soils on the southerly edge of the proposed parking area expansion. According to the site plans, the new retaining wall with have a negative foreslope approaching 6 feet in height at inclinations as steep as 2H:1V. The northerly side of the proposed parking expansion will have a cut slope approaching 8 feet in height with a slope of 2H:1V.

2.0 EXPLORATION AND TESTING

2.1 Exploration

On October 24, 2005 four test borings (B-101 through B-103 and B-106) were conducted by Great Works Test Borings, Inc. of Rollinsford New Hampshire working under subcontract to S. W. COLE ENGINEERING, INC. These test borings were made for the original proposed building layout. After the site layout was changed, test borings B-104 and B-105 were added to obtain subsurface information beneath the new building location and added access road. Test borings B-104 and B-105 were made on December 5 and 6, 2005 by Great Works Test Boring working under subcontract to S. W. COLE ENGINEERING, INC. The approximate locations of B-101 through B-106 are shown on the "Exploration Location Plan," attached as Sheet 1. Logs of these test borings are attached as Sheets 2 through 7. A key to the notes and symbols used on the logs is attached as Sheet 8. The elevation shown on the logs was estimated based on topographic information shown on Sheet 1.

In 1995, Woodard & Curran coordinated four test borings (B-1 through B-4) for the existing "North Wing" of the office building. The approximate location of these test borings are shown on Sheet 1. Logs of these test borings are attached in Appendix A.

2.2 Laboratory Testing

The test borings were made using cased wash boring drilling and rod probing techniques. Soil samples were obtained within the test borings at intervals of 2 and 5 feet using spilt spoon and Standard Penetration Test (SPT) methods. Field Vane Shear Tests were made in the test borings where softer cohesive soil deposits were encountered in order to assess in-situ soil strength properties. The results of Standard Penetration Tests and Field Vane Shear Tests are noted on the logs. Thin-wall Shelby Tube soil samples were obtained within softer cohesive soil deposits within certain test borings.

Laboratory testing was performed on selected samples recovered from the test borings. The results of Moisture Content (ASTM D-2216), Atterberg Limits (ASTM D-4318), and Unconfined Compressive Strength testing are also noted on the logs. The results of one Gradation Test (ASTM C-117) are shown on Sheet 9. The results of two One-Dimensional Consolidation Tests (ASTM D-2435) performed on samples of compressible gray silty clay obtained from test borings B-102 and B-105 are shown on Sheets 10 and 11. A third consolidation test was unsuccessful due to sample disturbance, therefore the results of this test are not included in this report. Based upon our laboratory testing, the glaciomarine clays are overconsolidated lean clays.

3.0 SUBSURFACE CONDITIONS

3.1 Site Conditions

The site of the proposed structure is on the northwesterly side of the existing north wing in an existing paved parking area. The proposed parking expansion to the east of the proposed building overlies a portion of the existing parking area and also extends to the northeast onto a gently sloping, tree-covered peninsula of land that is surrounded on three sides by a drainage feature. The proposed northerly parking expansion and stormwater filter basins overly a moderately-steep, wooded slope with grades varying from about 64 feet to 38 feet sloping downward from north to south. A stream separates the northerly parking area from the proposed building area. The stream flows from west to east and exists at about elevation 30 feet.

It should be noted an existing sanitary sewer currently traverses beneath the northerly edge of the proposed building addition footprint and will be relocated. A sanitary sewer lateral from the "South Wing" of the existing office building traverses the west portion of the proposed building.

3.2 Subsurface Conditions

In general, test borings B-101 through B-106 encountered a thin surficial layer of silty topsoil overlying stiff to hard brown silty clay which gradually becomes medium stiff with depth. The brown silty clay overlies soft to medium gray silty clay at depths of 9 to 14 feet from the ground surface overlying gray glacial till at depths of about 25 to 32 feet from the ground surface. The clay strata varied in thickness from about 11 to 20 feet, being thickest under the easterly portion of the proposed addition. Refusal surfaces (probable boulders in till) were encountered at borings B-102 and B-104 at depths of 40 and 44 feet, respectively. Borings B-101, and B-105 were extended to depths of about 55 and 40 feet, respectively, without encountering refusal surfaces. Borings B-103 and B-106 were terminated at depths of 12 feet in gray silty clay.

Not all the strata were encountered within each exploration. For more detail of the subsurface findings at the explorations, refer to the attached exploration logs.

S. W. COLE ENGINEERING, INC. also reviewed previous boring logs (B-1 through B-4) conducted by Woodard & Curran, Inc. It appears that the results of the current explorations (B-101 through B-106) are generally consistent with the results of the previous explorations (B-1 through B-4).

3.3 Groundwater Conditions

In general, the native underlying brown silty clay soils appeared to be wet below about elevation 35 feet (5 to 15 feet below the existing ground surface) at the time of drilling. The existing silty clay soils are poor draining and it should be anticipated that they become wet to saturated seasonally. It should be anticipated that groundwater will fluctuate seasonally and in response to precipitation and snow melt.

3.4 Seismic and Frost Conditions

According to the 2003 International Building Code, utilizing the results of field and laboratory testing, we interpret the subsurface conditions to correspond to a seismic soil Site Class E. The design-freezing index for the Portland area is about 1,250-Fahrenheit degree-days, which corresponds to a frost penetration depth on the order of 4.5 feet.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 General Findings

Based on the subsurface findings and our understanding of the proposed construction, it appears that the proposed addition can be supported on spread footing foundations. The main geotechnical concerns for the proposed construction are long term settlement due to the underlying compressible clay soils, and sensitive subgrade soils. In general, oversized footings will be needed to help reduce the effective stress increase in the underlying soils and subgrade soils must be overexcavated by about 12 inches and replaced with geotextile fabric wrapped mats of crushed stone (fabric wrapped stone mats) in order to protect the subgrades from disturbance during construction.

4.2 Excavation Work

An erosion control system should be in place prior to construction activity at the site to help protect adjacent drainage ways and properties. Topsoil, organics, stumps and roots must be stripped and grubbed from areas of proposed construction prior to placing fills and foundations. Additionally, existing pavements should be removed prior to fill placement. Vegetation and existing pavement should remain in areas of inactive construction as long as practical to help reduce surface erosion.

Below the topsoil and organics, excavation will encounter moist to wet silty clay. The silty clay is very sensitive to strength loss when disturbed. All excavations should be made with a smooth edged bucket. Heavy equipment should not operate on exposed subgrades. We recommend that excavation equipment operate on existing soils at an elevation above subgrade elevation such that the subgrade soils are not disturbed by the equipment. If subgrade soils become soft or disturbed during construction, the disturbed soil should be removed and replaced with compacted Structural Fill (below slab areas) or compacted crushed stone overlying geotextile fabric (below foundation areas). Excavations must be properly shored and/or sloped consistent with the OSHA trenching regulations to prevent sloughing and caving of the sidewalls during construction.

The silty clays are poor draining and will pond water if left exposed to precipitation. Based on the limited groundwater information available, it appears sumping and pumping dewatering techniques should be adequate to control water within foundation excavations during construction. Controlling the water levels to at least one foot below soil subgrade elevations will help stabilize the subgrade and provide a more suitable working surface during construction.

4.3 Site and Subgrade Preparation

As discussed, we recommend excavation and removal of the existing sanitary sewer and lateral from beneath the proposed building. The existing trench backfill soils should be completely removed and backfilled with compacted Structural Fill or Granular Borrow.

Foundations should be placed on 12-inch thick fabric wrapped crushed stone mats overlying stiff, undisturbed, native brown clay. The woven geotextile fabric, such as Mirafi 500X, should wrap around and over the top of the crushed stone such that the fabric extends beneath the footing edges. Slab-on-grade floors should be placed on at least 12 inches of compacted Structural fill overlying a woven geotextile fabric, such as Mirafi 500X, overlying stiff, undisturbed, native brown clay.

Considering the subsurface findings and our understanding of the proposed construction, we anticipate pavement subgrades will likely consist of principally stiff brown clay, compacted granular borrow or common borrow (re-used native brown clay). As such, we recommend pavement subbase gravels be underlain with woven geotextile fabric, such as Mirafi 500X.

We recommend utilities with soft gray clay subgrades be underlain with at least 12 inches of crushed stone over a non-woven filter fabric, such as Mirafi 160N, placed over the undisturbed gray clay trench bottom. The depth of crushed stone should be increased to 2 feet below structures, such as manholes and vaults.

4.4 Foundation Design

4.4.1 Spread Footings and Basement Walls

To protect spread footings and foundation underdrains from freezing temperatures, perimeter footings should be cast at least 4.5 feet below exterior finish grades. Since finish grades will be as high as 4.5 feet above finish floor elevations on the westerly side of the building, we recommend placing these foundations as high in elevation as possible to help improve both the bearing capacity and settlement characteristics of the foundation system. All footings should be underlain with a minimum of 12 inches of compacted crushed stone wrapped in woven geotextile fabric. For spread footings bearing on properly prepared subgrades we recommend the following geotechnical parameters for design consideration:

Recommended Geotechnical Parameters For Spread Footings	
Net Allowable Bearing Pressure	1.5 ksf or less
Base Friction Factor (tan δ)	0.4 (crushed stone)
Passive Lateral Earth Pressure Coeff. (K_p)	3.0 (Structural Fill)
At-Rest Lateral Earth Pressure Coeff. (K_o)	0.5 (Structural Fill)
Total Unit Weight of Backfill (γ_t)	130 pcf (Structural Fill))
Internal Friction Angle (ϕ)	30 degrees (Structural Fill)

These design parameters assume that a clean, compacted, non-frost susceptible, free-draining sand and gravel (Structural Fill) with an internal friction angle of at least 30° is utilized as backfill. These design values do not account for lateral surcharge loads from construction related activities such as compaction equipment or lateral loads due to wedging of backfill soils. The structural engineer should assess lateral loading both during construction and long term.

Further, we recommend that all perimeter frost walls be damp-proofed and insulated using a 2-inch thickness of rigid insulation to help reduce heat loss through the concrete. On the west, south and north wall lines, where finish floor elevations are planned below proposed exterior grades, the insulation should be placed on the exterior side of the walls. On the east and north wall lines, where the frost walls are planned below the finish floor and exterior grade, the insulation should be placed on the interior side of the frost wall.

4.4.2 Settlement and Seismic Considerations

In general, less settlement is anticipated in the western and southern portions of the addition because this portion of the building will have a finish floor elevation approaching 4.5 feet below existing grades and the compressible soils in this area were not as thick. The eastern portion of the building will have a finish floor elevation approaching 1-foot above existing grades and the compressible soils are thicker in this area; however, it appears that the soils were cut to achieve proposed grades during construction of the north wing. Within the northern portion of the building, the finish floor elevation will be close to existing grade and a tapered embankment fill approaching 9 feet thick will be placed adjacent to the northerly wall line to construct the access road. We anticipate settlement to be the greatest magnitude in the north portion of the building.

Based on the loading information you provided for the north wing addition, we have estimated the potential loads for the proposed new addition. Based on the anticipated loading, the proposed and existing grades and the results of our laboratory consolidation testing, we have estimated post-construction settlement may approach 1-inch total and ¾-inch differential. In our experience, the estimated post-construction settlement is generally within tolerable limits for the proposed construction. We recommend design include control joints in foundation concrete and any masonry or brick siding to control random cracking due to minor settlement as well as thermal expansion and contraction of the building.

According to the 2003 International Building Code, utilizing the results of field and laboratory testing, we interpret the subsurface conditions to correspond to a seismic soil Site Class E.

4.5 Foundation Drainage

We recommend that a perimeter underdrain be provided within the fabric wrapped crushed stone mats and outside the 1H:1V bearing splay of the perimeter footings. Rigid, 4-inch diameter, perforated foundation drain pipes with perforations of ¼ to ½ inch should be utilized. The foundation drains must have positive gravity outlets. Exterior foundation backfill should be sealed with a surficial layer of clayey or loamy soil in areas that are not to be paved or occupied by entrance slabs. This is to reduce direct surface water infiltration into the backfill. Ideally, surface grades should be sloped away from the building to shed surface water. Roof drains must be routed in separate non-perforated drain lines such that roof drainage is not introduced into the foundation drainage system. General underdrain details are shown on Sheet 12.

4.6 Slab-on-Grade Floors

Slab-on-grade floors in heated spaces may be designed using a subgrade reaction modulus of 150 pci provided the concrete slab is underlain by at least 12 inches of compacted Structural Fill overlying a woven geotextile fabric, such as Mirafi 500X, overlying properly prepared subgrades. In areas where the footing elevations are held as high as possible, as discussed in Section 4.4, we recommend at least 6 inches of Structural Fill be placed between the top of footings and bottom of floor slab.

For slab-on-grade floors, we recommend that a 15-mil vapor barrier be placed directly below the floor slab concrete. The vapor barrier should have a permeance that is less than the floor covering being applied on the slab and should be installed according to the manufacturer's recommended methods including taping all joints and wall connections. Flooring suppliers should be consulted relative to acceptable vapor barrier systems for use with their products. The vapor barrier must have sufficient durability to withstand direct contact with the sub-slab fill and construction activity.

We recommend that control joints be installed within floor slabs to accommodate shrinkage in the concrete as it cures. In general, control joints are usually installed at 10 to 15 foot spacing; however, the actual spacing of control joints should be determined by the structural engineer. We recommend that slabs be wet-cured for a period of at least 7 days after casting as a measure to reduce the potential for curling of the concrete and excessive drying/shrinkage. We further recommend that consideration be given to using a curing paper or curing compound after the wet-cure period to improve the quality of the completed floor.

4.7 Entrance Slabs and Sidewalks

Entrance slabs and sidewalks adjacent to the building should be designed to reduce the adverse effects of frost action between adjacent pavement, doorways, and entrances. We recommend that a frost control zone of Structural Fill be provided to a depth of at least 4.5 feet below the top of entrance slabs and sidewalks. The Structural Fill should extend horizontally outward from the building the full width and length of entrance slabs and then transition up to bottom of adjacent pavement or sidewalk sub-base at a 3H:1V or flatter slope. This is to help reduce differential movement due to frost. General details of this frost transition zone are shown on Sheet 12.

4.8 Site Retaining Walls

Based upon the subsurface findings and our understanding of the proposed construction, we anticipate that MSE walls and cast-in-place reinforced concrete retaining walls will be considered for construction adjacent to the access road and adjacent to the expanded northerly parking area. MSE walls can tolerate some settlement and generally perform better than rigid concrete walls when settlement is anticipated. In our opinion, MSE walls are more appropriate along the access road adjacent to the new building addition and cast-in-place reinforced concrete walls are feasible for construction adjacent to the expanded northerly parking area.

We understand that retaining wall design will be completed by others and that S. W. COLE ENGINEERING, INC. will be engaged to perform a global stability analysis during design and prior to construction.

4.8.1 MSE Walls

For a MSE Wall constructed along the proposed access road adjacent to the proposed building addition and founded on properly prepared subgrades, we recommend the following geotechnical parameters for design:

Geotechnical Parameters for MSE Wall along Access Road	
Net Allowable Bearing Pressure	1.5 ksf or less
Base Friction Factor	0.4 (crushed stone)
Reinforced Zone Backfill Unit Weight	130 pcf (Structural Fill)
Reinforced Zone Internal Friction Angle	30 degrees (Structural Fill)
Retained Soil Unit Weight	125 pcf (Granular or Common Borrow)
Retained Soil Internal Friction Angle	26 degrees (Granular or Common Borrow)

Design of the MSE Walls must consider increased embedment depth to account for the negative foreslope in front of the walls as well as surcharge loads from traffic loading. We recommend the MSE Wall be designed considering a minimum geogrid length of at least 70 percent of the overall wall height. Ideally, at least 4.5 feet (horizontal measure) of Structural Fill should be used as backfill behind the wall to control potentially adverse frost thrust on the wall.

We recommend the MSE Wall and reinforced zone be underlain by a 12-inch thick mat of crushed stone wrapped in a woven geotextile fabric with perforated 4-inch diameter underdrain pipe installed at the back of the reinforced zone. The underdrain must be provided with a positive gravity outlet. General MSE Wall details are shown schematically on Sheet 12.

4.8.2 Reinforced Concrete Retaining Walls

For a cast-in-place Reinforced Concrete Retaining Wall constructed adjacent to the proposed northern parking area and founded on properly prepared subgrades, we recommend the following geotechnical parameters for design:

Geotechnical Parameters for Reinforced Concrete Wall for North Parking Area	
Net Allowable Bearing Pressure	3.0 ksf or less
Base Friction Factor	0.4 (Structural Fill)
Passive Lateral Earth Pressure Coeff. (K_p)	3.0 (Structural Fill)
Active Lateral Earth Pressure Coeff. (K_a)	0.33 (Structural Fill)
Total Unit Weight of Backfill (γ_t)	130 pcf (Structural Fill)
Internal Friction Angle (Φ)	30 degrees (Structural fill)

We recommend the foundations for cast-in-place concrete retaining walls adjacent to the north parking lot be underlain with at least 8 inches of compacted Structural Fill. Cast-in-place reinforced concrete walls should be constructed with weepholes or underdrains to preclude the build-up of water and hydrostatic pressure behind the retaining wall.

4.9 Backfill and Compaction

The native soils are frost susceptible silty clay and are not suitable for reuse as backfill adjacent to foundations and retaining walls. We recommend foundation and wall backfill materials consist of clean sand and gravel meeting the gradation requirements for Structural Fill, as given below. Structural Fill should also be used as backfill for MSE Walls within the reinforced soil zone and Reinforced Concrete Walls, as well as backfill for the excavated trench after removal of the existing sanitary sewer.

Structural Fill	
Sieve Size	Percent Finer by Weight
4 inch	100
3 inch	90 to 100
¼ inch	25 to 90
No. 40	0 to 30
No. 200	0 to 5

Crushed Stone used under footings and as underdrain aggregate should meet the gradation given below. A nominal size ¾-inch crushed stone usually meets these gradation requirements.

Crushed Stone	
Sieve Size	Percent Finer by Weight
1 inch	100
¾ inch	90 to 100
3/8 inch	0 to 75
#4	0 to 25
#10	0 to 5

We understand that grades under the proposed access road and grades in the proposed northerly parking lot expansion area will require as much as 10 feet of compacted fill. Grades in paved areas can be raised using compacted Common Borrow or Granular Borrow. Common Borrow is generally a mixture of sand, silt and clay at a compactable moisture content that meets the requirements of MDOT Standard Specification 703.18. Granular Borrow is generally a mixture of sand, silt and gravel at a compactable moisture content meeting the gradation requirements of MDOT Standard Specification 703.19, as given below.

Granular Borrow	
Sieve Size	Percent Finer by Weight
6 inch	100
#40	0 to 70
#200	0 to 20

Based on the observations made at the explorations, it appears that the existing native brown clays that are to be excavated are at moisture contents that are too wet for reuse as Common Borrow without drying. The existing base and subbase fills in paved areas can likely be reused as compacted Granular Borrow.

Fill and backfill beneath building and paved areas should be compacted to 95 percent of its maximum dry density as determined by ASTM D-1557. Crushed stone below footings should be compacted to 100 percent of its dry rodded unit weight as determined by ASTM C-29. Retaining wall and MSE Wall backfill should be compacted to between 92 to 95 percent of its maximum dry density as determined by ASTM D-1557. Lift thickness should be 6 to 12 inches such that desired density is achieved throughout the lift thickness with 3 to 5 passes of the compaction equipment.

4.10 Pavements

Based on our understanding of the proposed construction, we anticipate pavements will be used for parking and access drives for passenger cars. Pavement subgrades should be sloped and subbase gravel daylighted to provide underdrain relief of the pavement gravels. Where daylighting of subbase gravel is not possible, we recommend MDOT Type B Underdrains be installed to provide underdrain relief for pavement gravels. It must be understood that without replacement of the native soil below pavements with non-frost susceptible soil for the full depth of frost penetration, some frost related movement of the pavements will occur.

Based on our experience with projects of similar size and scope, and considering the subsurface conditions encountered, we offer the following standard duty pavement structure for car parking and access drive areas:

Recommended Standard Duty Pavement (Car Parking)	
Pavement Layer	Thickness
MDOT 9.5 mm Superpave or Grade C Hot Mix Asphalt	1.25 inches
MDOT 12.5 mm Superpave or Grade B Hot Mix Asphalt	1.75 inches
MDOT Crushed Aggregate Base 703.06 Type A	3 inches
Maine DOT Aggregate Subbase 703.06 Type D	12 inches
Woven Subgrade Geotextile, Mirafi 500X	YES

The bituminous pavement should be compacted to 92 to 97 percent of its theoretical maximum density as determined by ASTM D-2041. Tack coat should be applied between successive lifts of asphalt, as necessary. The base and subbase materials should be compacted to at least 95 percent of their maximum dry densities as determined by ASTM D-1557. We recommend that all fill placed below the base and subbase materials to subgrade level be compacted to at least 95 percent of ASTM D-1557.

4.11 Weather Considerations

If foundation construction takes place during cold weather, subgrades, foundations and floor slabs must be protected during freezing conditions. Concrete and pavement must not be placed on frozen soil and once placed, the soil beneath structures must be protected from freezing.

4.12 Design Review and Construction Testing

S. W. COLE ENGINEERING, INC. should be retained to review the final design and specifications to determine that our earthwork recommendations have been properly interpreted and implemented.

A soils, asphalt, and concrete testing program should also be implemented during construction to observe compliance with the design concepts, plans and specifications. S. W. COLE ENGINEERING, INC. is available to provide field and laboratory testing services for soil, concrete, masonry, steel, fireproofing and asphalt construction materials.

5.0 CLOSURE

It has been a pleasure to be of assistance to you with this phase of your project. If you have any questions, please do not hesitate to contact us.

Sincerely,

S. W. COLE ENGINEERING, INC.

Andrew R. Simmons, P.E.
Geotechnical Engineer

Timothy J. Boyce, P.E.
Senior Geotechnical Engineer

STATE OF MAINE
TIMOTHY J. BOYCE
No. 9263
REGISTERED
PROFESSIONAL ENGINEER

ARS-TJB:pfb

P:\2005\05-1126_S_W&C_Portland_Proposed Bldg Addition to W&C_TJB\05-1126 Geo Report.doc

ATTACHMENT A - LIMITATIONS

This report has been prepared for the exclusive use of Woodard & Curran Inc. for specific application to the proposed office addition and parking lot expansion at 41 Hutchins Drive in Portland, Maine. S. W. COLE ENGINEERING, INC. has endeavored to conduct the work in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

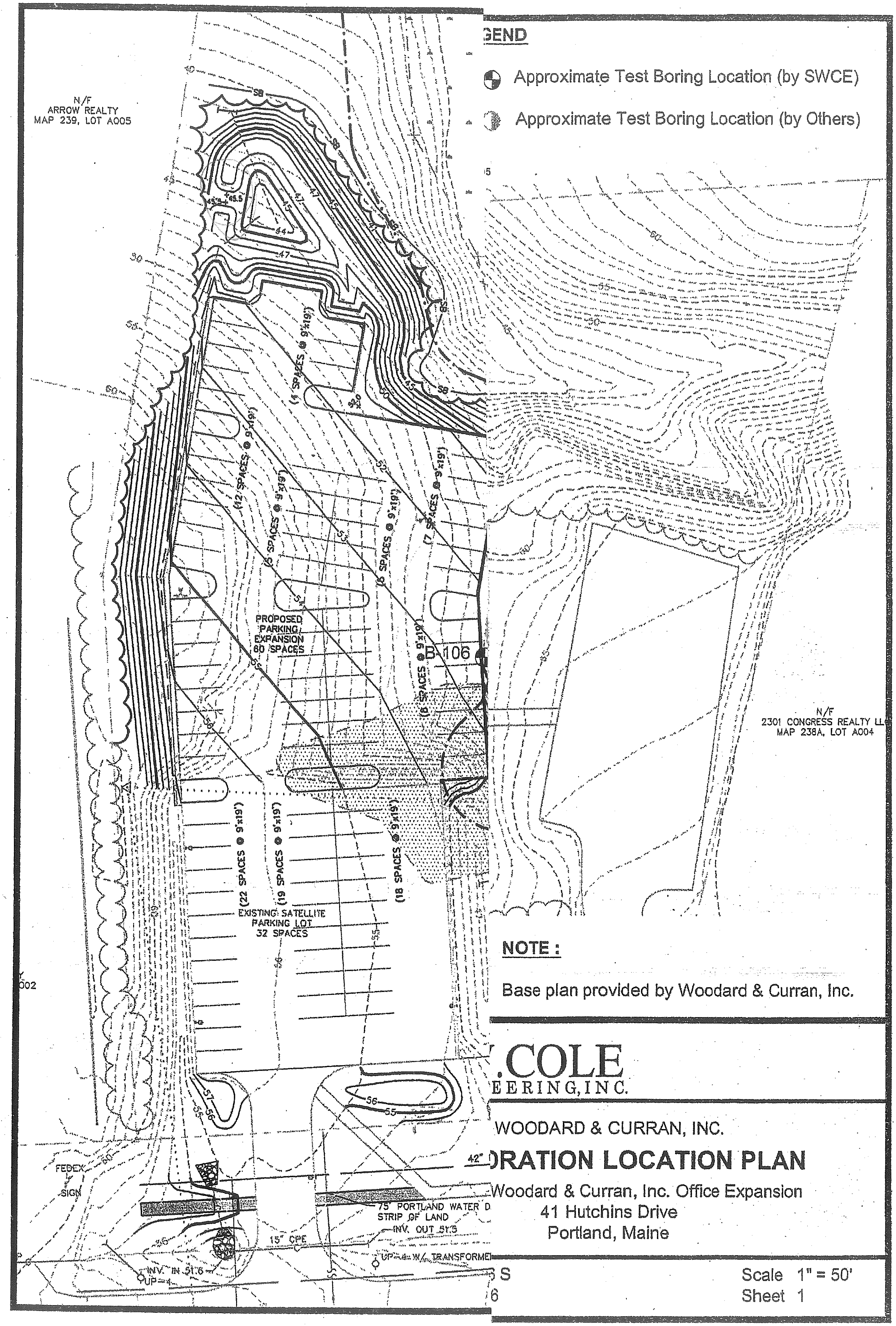
The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

S. W. COLE ENGINEERING, INC.'s scope of work has not included the investigation, detection, or prevention of any Biological Pollutants at the project site or in any existing or proposed structure at the site. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S. W. COLE ENGINEERING, INC. should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless S. W. COLE ENGINEERING, INC. reviews the changes.


LEGEND
Approximate Test Boring Location (by SWCE)
Approximate Test Boring Location (by Others)
N/F
ARROW REALTY
MAP 239, LOT A005
(4 SPACES @ 9'x19')
(12 SPACES @ 9'x19')
(15 SPACES @ 9'x19')
(15 SPACES @ 9'x19')
(7 SPACES @ 9'x19')
(8 SPACES @ 9'x19')
PROPOSED
PARKING
EXPANSION
60 SPACES
B-106
N/F
2301 CONGRESS REALTY LL
MAP 238A, LOT A004
(22 SPACES @ 9'x19')
(19 SPACES @ 9'x19')
(18 SPACES @ 9'x19')
EXISTING SATELLITE
PARKING LOT
32 SPACES
NOTE :
Base plan provided by Woodard & Curran, Inc.
.COLE
EERING,INC.
WOODARD & CURRAN, INC.
ORATION LOCATION PLAN
Woodard & Curran, Inc. Office Expansion
41 Hutchins Drive
Portland, Maine
Scale 1" = 50'
Sheet 1
FEDEX
SIGN
42"
75' PORTLAND WATER D
STRIP OF LAND
INV. OUT 51.9
15" CPE
UP-4 W/ TRANSFORME
INV. IN 51.6
UP-4

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	B-101
SHEET:	1 OF 1
PROJECT NO.:	05-1126
DATE START:	10/24/2005
DATE FINISH:	10/24/2005
ELEVATION:	45' +/-
SWC REP.:	A. SIMMONS

PROJECT / CLIENT: PROPOSED WOODARD & CURRAN INC. OFFICE EXPANSION / WOODARD & CURRAN INC.

LOCATION: 41 HUTCHINS DRIVE, PORTLAND, MAINE

DRILLING CO. : GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN	140 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION

SOILS SATURATED @ 7 FEET

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									3"	BITUMINOUS ASPHALT
	1D	24"	12"	2.5'	10	16	5	4	2.0'	BROWN SILTY GRAVELLY SAND (FILL)
										BROWN SILTY CLAY
	2D	24"	24"	4.5'	5	5	6	6		w = 28.3% qp = 5 KSF
										~ VERY STIFF ~
	3D	24"	24"	7.0'	3	4	4	4		w = 29.7% qp = 5 KSF
										~ MEDIUM ~
	4D	24"	24"	9.0'	4	5	5	5	9.5'	w = 37.0% qp = 2 KSF
										qp = 0.5 KSF
	5D	24"	24"	12.0'	WOH					w = 43.3% qp < 0.25 KSF
										W_L = 39
	1U	24"	24"	17.0'	HYDRAULIC					W_P = 21
	Sv: 3.5x7			20.8'		58/8				Sv = 0.60 / 0.08 KSF
				21.6'		56/9				Sv = 0.58 / 0.09 KSF
									25.6'	w = 34.1%
	2U	24"	5"	27.0'	HYDRAULIC					
										GRAY SILTY FINE SAND, SOME GRAVEL (GLACIAL TILL) WITH COBBLES
	6D	24"	24"	32.0'	11	12	25	37		~ DENSE ~ w = 10.7%
									55.0'	ADVANCE RODS TO 55 FEET
										BOTTOM OF EXPLORATION @ 55 FEET

SAMPLES:

D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:

	DRILLER - VISUALLY
X	SOIL TECH. - VISUALLY
X	LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

2

BORING NO.: B-101

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-102
SHEET: 1 OF 1
PROJECT NO.: 05-1126
DATE START: 10/24/2005
DATE FINISH: 10/24/2005
ELEVATION: 42' +/-
SWC REP.: A. SIMMONS

PROJECT / CLIENT: PROPOSED WOODARD & CURRAN INC. OFFICE EXPANSION / WOODARD & CURRAN INC.
LOCATION: 41 HUTCHINS DRIVE, PORTLAND, MAINE
DRILLING CO.: GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN	140 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS SATURATED @ 7 FEET

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									2"	CLAYEY TOPSOIL
	1D	24"	14"	2.0'	1	2	5	8		
										BROWN SILTY CLAY
	2D	24"	20"	4.0'	6	15	17	18		qp = 9 KSF
										~ HARD ~
	3D	24"	24"	7.0'	4	5	7	9		qp = 6 KSF
	Sv: 2x4			10.5'		36/6				Sv = 2.0/0.33 KSF ~ STIFF ~
				11.0'		45/5			12.0'	Sv = 2.5/0.28 KSF
										GRAY SILTY CLAY
	Sv: 3.5x7			15.8'		55/8				Sv = 0.57/0.08 KSF ~ MEDIUM ~
				16.6'		55/8				Sv = 0.57/0.08 KSF
	1U	24"	24"	22.0'	HYDRAULIC					qu = 1.2 KSF w = 47.3% W_L = 44 W_P = 25
	Sv: 3.5x7			25.8'		62/8				Sv = 0.64 / 0.08 KSF
				26.6'		60/8				Sv = 0.62 / 0.08 KSF
									31.5'	
	4D	24"	24"	32.0'	WOR/12"		1	5		GRAY SILTY FINE SAND, SOME GRAVEL (GLACIAL TILL) WITH COBBLES
									40.4'	
	5D	4"	4"	40.4'	50/4"					REFUSAL @ 40.4 FEET (PROBABLE BOULDER IN GLACIAL TILL)

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

3

BORING NO.: B-102

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-103
SHEET: 1 OF 1
PROJECT NO.: 05-1126
DATE START: 10/24/2005
DATE FINISH: 10/24/2005
ELEVATION: 38' +/-
SWC REP.: A. SIMMONS

PROJECT / CLIENT: PROPOSED WOODARD & CURRAN INC. OFFICE EXPANSION / WOODARD & CURRAN INC.
LOCATION: 41 HUTCHINS DRIVE, PORTLAND, MAINE
DRILLING CO.: GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN	140 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS SATURATED @ 5 FEET

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									6"	FOREST DUFF
	1D	24"	14"	2.0'	3	2	4	8		qp = 9 KSF
										BROWN SILTY CLAY
	2D	24"	18"	4.0'	6	10	14	13		~ VERY STIFF ~ qp = 6 KSF
	3D	24"	20"	7.0'	3	5	7	8		qp = 6 KSF
										~ STIFF ~
									10.0'	qp = 1.5 KSF
										GRAY SILTY CLAY qp = 0.5 KSF
	4D	24"	24"	12.0'	1	2	2	2	12.0'	~ MEDIUM ~
										BOTTOM OF EXPLORATION @ 12.0 FEET

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

4

BORING NO.: B-103

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-104
SHEET: 1 OF 1
PROJECT NO.: 05-1126
DATE START: 12/5/2005
DATE FINISH: 12/6/2005
ELEVATION: 42' +/-
SWC REP.: A. SIMMONS

PROJECT / CLIENT: PROPOSED WOODARD & CURRAN INC. OFFICE EXPANSION / WOODARD & CURRAN INC.
LOCATION: 41 HUTCHINS DRIVE, PORTLAND, MAINE
DRILLING CO.: GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN	140 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS SATURATED @ 10 FEET

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										BROWN SILTY CLAY
										~ STIFF ~
	1D	24"	24"	7.0'	4	5	6	8		qp = 6 KSF
									10.0'	
	1U	24"	21"	12.0'	HYDRAULIC					GRAY SILTY CLAY
	Sv: 3.5x7			15.8'		50/9				Sv = 0.52/0.09 KSF ~ MEDIUM ~
				16.6'		58/18				Sv = 0.60/0.19 KSF
	2U	24"	24"	22.0'	HYDRAULIC					
	Sv: 3.5x7			25.8'		85/11			25.8'	Sv = 0.88/0.11 KSF
					NO PENETRATION					GRAY SILTY FINE SAND, SOME GRAVEL (GLACIAL TILL) WITH SOME COBBLES
	2D	24"	8"	32.0'	41	53	42	34		~ VERY DENSE ~
	3D	0"	0"	35.0'	HOLE CAVED IN					
									44.5'	REFUSAL @ 44.5 FEET (PROBABLE BOULDER IN GLACIAL TILL)

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

5

BORING NO.: B-104

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-105
SHEET: 1 OF 1
PROJECT NO.: 05-1126
DATE START: 10/24/2005
DATE FINISH: 10/24/2005
ELEVATION: 51' +/-
SWC REP.: A. SIMMONS

PROJECT / CLIENT: PROPOSED WOODARD & CURRAN INC. OFFICE EXPANSION / WOODARD & CURRAN INC.
LOCATION: 41 HUTCHINS DRIVE, PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN	140 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS SATURATED @ 15 FEET

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									1.0'	BROWN SILT (FILL)
	1D	24"	8"	2.0'	3	3	4	4		BROWN SILTY CLAY
	2D	24"	24"	7.0'	7	10	12	18		~ VERY STIFF ~ qp = 6 KSF
	Sv: 2x4			10.5'		55/9				Sv = 3.1/0.5 KSF ~ VERY STIFF ~
				11.0'		48/9				Sv = 2.7/0.5 KSF
									14.5'	
	1U	24"	24"	17.0'	HYDRAULIC					GRAY SILTY CLAY w = 48.3 %
	Sv: 3.5x7			20.8'		58/8				Sv = 0.60/0.08 KSF
				21.6'		58/8				Sv = 0.60/0.08 KSF ~ MEDIUM ~
	Sv: 3.5x7			25.8'		82/10			25.8'	Sv = 0.85/0.10 KSF
					NO PENETRATION					GRAY SILTY FINE SAND, SOME GRAVEL (GLACIAL TILL) WITH SOME COBBLES
	3D	24"	12"	32.0'	6	7	8	10		~ MEDIUM DENSE ~
									40.0'	ADVANCE RODS TO 40 FEET
										BOTTOM OF EXPLORATION @ 40 FEET

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

6

BORING NO.: B-105

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-106
SHEET: 1 OF 1
PROJECT NO.: 05-1126
DATE START: 10/24/2005
DATE FINISH: 10/24/2005
ELEVATION: 43' +/-
SWC REP.: A. SIMMONS

PROJECT / CLIENT: PROPOSED WOODARD & CURRAN INC. OFFICE EXPANSION / WOODARD & CURRAN INC.
LOCATION: 41 HUTCHINS DRIVE, PORTLAND, MAINE
DRILLING CO.: GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN	140 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS SATURATED @ 6 FEET

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA	
									2"	FOREST DUFF	
	1D	24"	12"	2.0'	1	1	2	4		BROWN SILT SOME CLAY	
									3.0'	~ LOOSE ~	
	2D	24"	20"	4.0'	4	14	16	20		BROWN SILTY CLAY	qp = 9 KSF
										~ HARD ~	
	3D	24"	24"	7.0'	5	11	10	9			qp = 6 KSF
											qp = 2 KSF
										~ MEDIUM ~	
									11.0'		qp = 2 KSF
	4D	24"	24"	12.0'	1	1	1	1	12.0'	GRAY SILTY CLAY ~ SOFT ~	qp < 0.25 KSF
										BOTTOM OF EXPLORATION @ 12.0 FEET	

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

7

BORING NO.: B-106

S.W.COLE ENGINEERING, INC. • Geotechnical Engineering • Field & Lab Testing • Scientific & Environmental Consulting

KEY TO THE NOTES & SYMBOLS
Test Boring and Test Pit Explorations

All stratification lines represent the approximate boundary between soil types and the transition may be gradual.

Key to Symbols Used:

w	-	water content, percent (dry weight basis)
q_u	-	unconfined compressive strength, kips/sq. ft. - based on laboratory unconfined compressive test
S_v	-	field vane shear strength, kips/sq. ft.
L_v	-	lab vane shear strength, kips/sq. ft.
q_p	-	unconfined compressive strength, kips/sq. ft. based on pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W_L	-	liquid limit - Atterberg test
W_P	-	plastic limit - Atterberg test
WOH	-	advance by weight of hammer
WOM	-	advance by weight of man
WOR	-	advance by weight of rods
HYD	-	advance by force of hydraulic piston on drill
RQD	-	Rock Quality Designator - an index of the quality of a rock mass. RQD is computed from recovered core samples.
γ_T	-	total soil weight
γ_B	-	buoyant soil weight
HSA	-	Hollow Stem Auger
HW	-	4" Casing
NW	-	3" Casing
SS	-	split-spoon sampler

Description of Proportions:

0 to 5% TRACE
5 to 12% SOME
12 to 35% "Y"
35+% AND

REFUSAL: **Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

REFUSAL: **Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.

S.W.COLE ENGINEERING, INC.

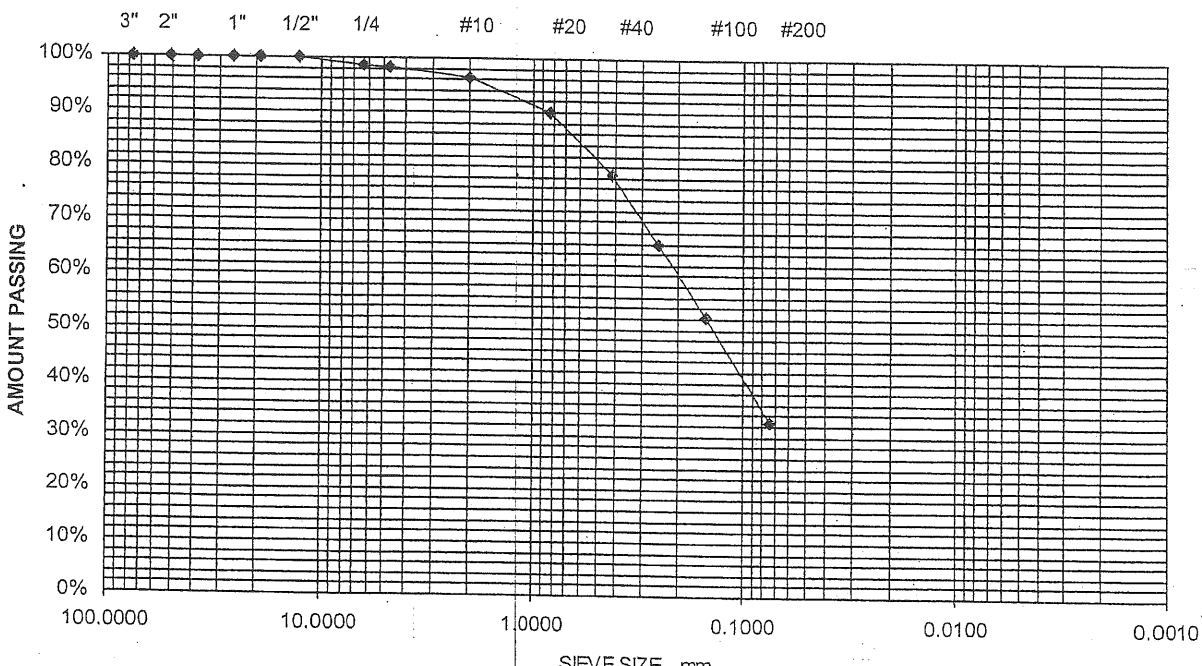
Report of Gradation

ASTM C-117 & C-136

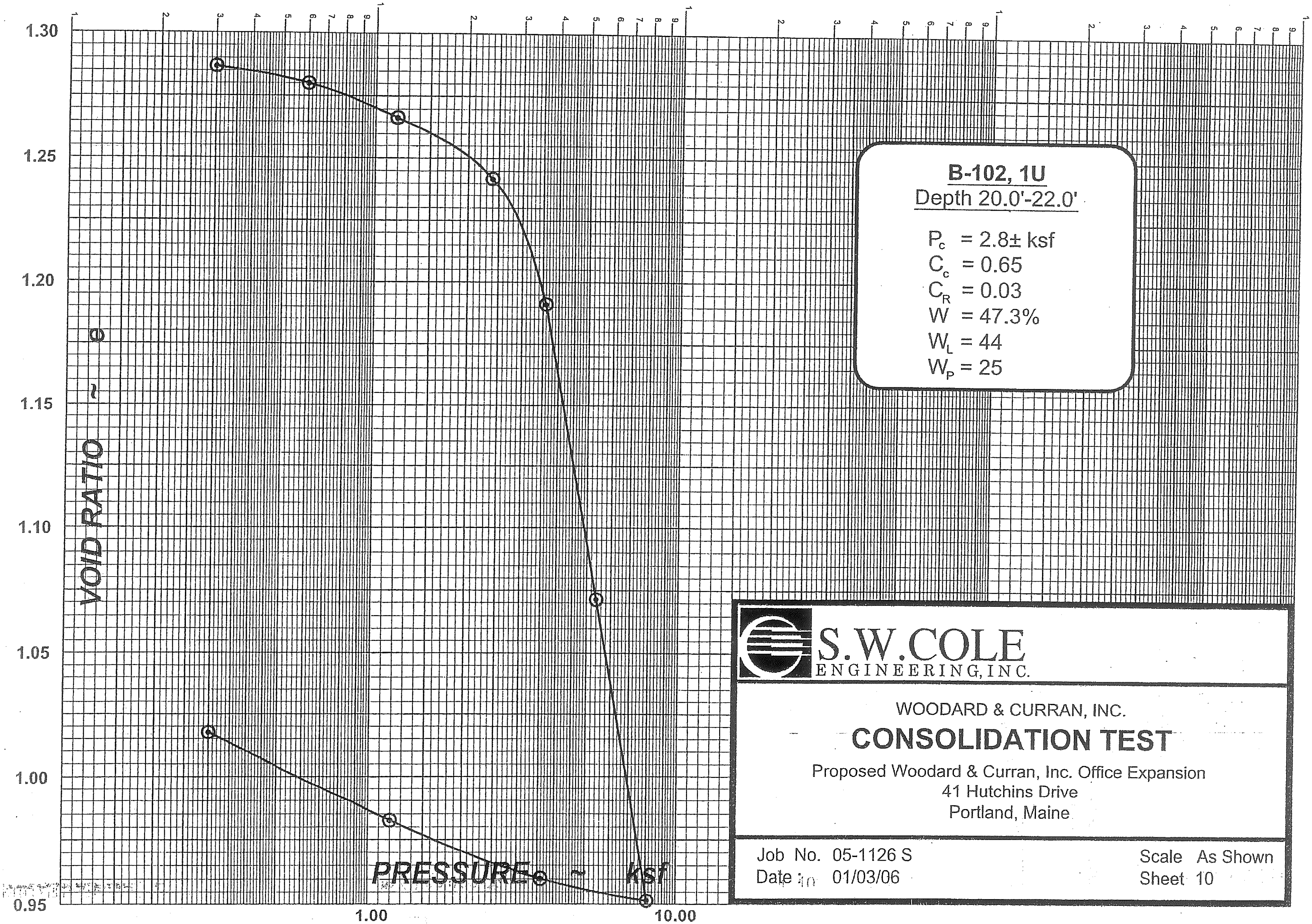
Project Name	PORTLAND - PROPOSED OFFICE ADDITION - GEOTECHNICAL SERVICES	Project Number	05-1126
Client	WOODARD & CURRAN, INC.	Lab ID	4366G
Exploration	B-101 6D	Date Received	11/1/2005
Material Source	30'-32'	Date Complete	11/7/2005
		Tested By	COLIN PATTERSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	100	
19.0 mm	3/4"	100	
12.5 mm	1/2"	100	
6.3 mm	1/4"	99	
4.75 mm	No. 4	98	1.6% Gravel
2.00 mm	No. 10	96	
850 um	No. 20	90	
425 um	No. 40	79	65.6% Sand
250 um	No. 60	66	
150 um	No. 100	52	
75 um	No. 200	32.8	32.8% Fines

GRAY SILTY FINE SAND SOME GRAVEL (TILL)



Comments: w = 10.7%



S.W.COLE ENGINEERING, INC.

WOODARD & CURRAN, INC.

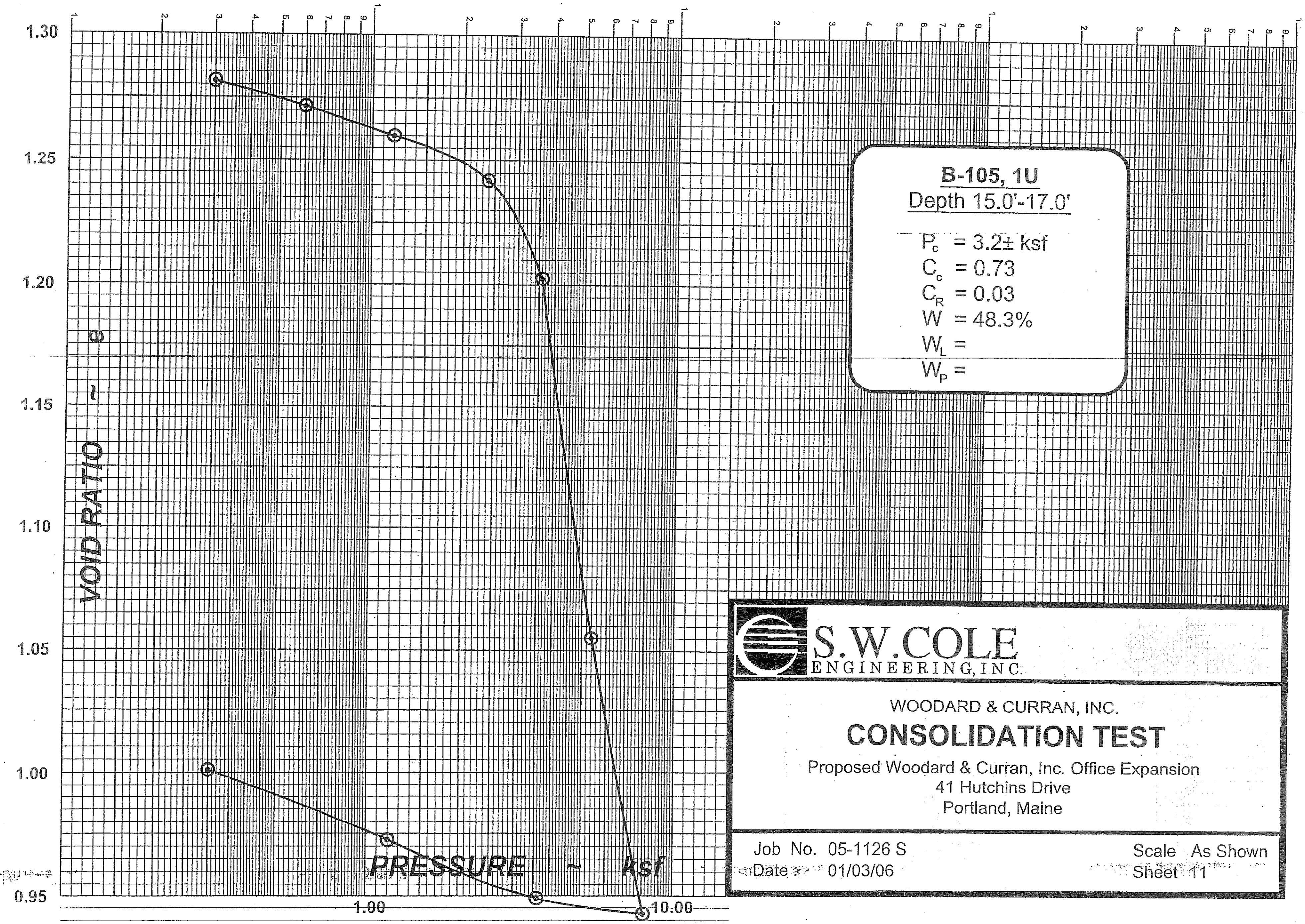
CONSOLIDATION TEST

Proposed Woodard & Curran, Inc. Office Expansion
41 Hutchins Drive
Portland, Maine

Job No. 05-1126 S
Date : 01/03/06

Scale As Shown
Sheet 10

P:\2005\05-1126\05-1126 consol 105-1.dwg, Layout1, 1/3/2006 9:37:49 AM, DRay, Adobe PDF, PostScript Custom Page Size, 1:0.99131



S.W.COLE
ENGINEERING, INC.

WOODARD & CURRAN, INC.

CONSOLIDATION TEST

Proposed Woodard & Curran, Inc. Office Expansion
41 Hutchins Drive
Portland, Maine

Job No. 05-1126 S
Date 01/03/06

Scale As Shown
Sheet 11

From: Tammy Munson
To: Philip DiPierro
Date: 3/7/2007 1:45:17 PM
Subject: Re: 43 Ruby Lane Temp. C of O

Hi Phil. I have to issue a temporary C of O for 41 Hutchins Drive. I believe it is the Woodard and Curran addition. There were several site conditions and DEP conditions required under the original review. They will be issued a temporary C of O. Could you please send the conditions or we can attach the original memo to the C of O. Barbara B. is familiar w/the property. Thanks.

>>> Philip DiPierro 3/7/2007 9:26:00 AM >>>
43 Ruby Lane has been inspected. Please see attached.

Philip DiPierro
Development Review Coordinator
389 Congress Street
Portland, Maine 04101

Phone 207 874-8632
Fax 207 756-8258

- Surface Coat
- Landscaping

temp. C of O
Lighting
temp. striping
Erosion control

move dumpster from transformer area to new area.

PORTLAND MAINE

Strengthening a Remarkable City. Building a Community for Life www.portlandmaine.gov

Planning and Development Department
Lee D. Urban, Director

Planning Division
Alexander Jaegerman, Director

September 29, 2006

CADCAM Associates 41 Hutchins Drive Portland, ME 04102	Eric & Peggy Cianchette c/o ELC, Inc. 42 Market Street Portland, ME 04101	Kenny Volock, Engineer, Woodard & Curran, Inc 41 Hutchins Drive Portland, ME. 04102

RE: 41 Hutchins Drive: Amendments to Approved Plan (Access Drive)
Chart 238A Block A Lot 1; Chart 239 Block A Lot 4
Application #2006-0178

Dear Mr. Volock (on behalf of the joint applicants):

This letter is to confirm that the revisions to the approved site plan for the building addition for Woodard & Curran office expansion, at the above address, have been reviewed and approved. The amendments include the relocation of part of the main access drive where it meets Hutchins Drive, and associated modifications to drainage, lighting and other utilities, as shown on the approved plans.

The approval is based on the submitted revised site plan. If you need to make any further modifications to the approved site plan, you must submit a revised site plan for staff review and approval.

Please submit seven (7) sets of the final drawings and documents, along with a set in electronic form (electronic Autocad files (*.dwg), release 14 or greater).

If there are any questions, please contact Jean Fraser at 874-8728 or jf@portlandmaine.gov.

Sincerely,

Alexander Jaegerman
Planning Division Director

ASSOCIATED DESIGN PARTNERS INC.
80 Leighton Road ▪ Falmouth, Maine 04105

Office: 207.878.1751
Fax: 207.878.1788
e-mail: adp@adpengineering.com

MSE CALCULATIONS SHOP DRAWING SUBMITTAL

FOR

(Walls 1 & 2) WOODWARD & CURRAN MSE RETAINING WALL PORTLAND, ME

SUBMITTED ON July 6, 2006
BY

Pre-Cast Concrete Products of Maine, Inc.
PO Box 307
Augusta Road
Topsham, Maine 04086
(800) 696-8265 FAX (207) 729-8710
Contact: Paul Beers

STATE OF MAINE
AARON S. WILSON
NO. 10429
REGISTERED PROFESSIONAL ENGINEER

PREPARED BY:
ASSOCIATED DESIGN PARTNERS INC
80 LEIGHTON ROAD
FALMOUTH, MAINE 04105
(207) 878-1751 FAX (207) 878-1788
ADP# 06120

CITY OF PORTLAND
APPROVED SITE PLAN
Subject to Dept. Conditions
Date of Approval: 8-25-2006
2006-0120

SHOP DRAWING REVIEW

ENGINEER'S REVIEW

- [ ] A- REVIEWED
- [ ] B-FURNISH AS CORRECTED
- [x] C- REVISE & RESUBMIT
- [ ] D- REJECTED

Corrections or comments made on the shop drawings during this review do not relieve contractor from compliance with requirements of the drawings and specifications. This check is only for review of the general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for: Confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his or her work with that of all other trades and performing all work in a safe and satisfactory manner.

WOODARD & CURRAN INC.
By [signature]
Spec. Section PLANS

Date Received: 7/11/06
Date Reviewed: 7/19/06
Submittal #: 02835-001A

SHEET RT2 -
"TYPICAL DETAIL"
· DELETE FENCE
· MOVE GUARDRAIL
· SET WALL AT
EDGE OF PAVEMENT

Licensed to: **Associated Design Partners Inc**
80 Leighton Road, Box A
Falmouth ME 04105

License Number: **U010206203**

Project Identification:

Project Name: **Woodard & Curran MSE**
Section:
Data Sheet: **06120**

Owner:
Client: **Pre-Cast of Maine**

Prepared by: **Nick Rogers, Associated Design Partners, Inc.**
Date: **July 7, 2006**
Time: **12:58:27 PM**

Data file: **g:\project files\2006proj\06120\structural\06120-calcs wall1**

Type of Structure: **Geosynthetic-Reinforced Segmental Retaining Wall**
Design Methodology: **NCMA Method A**

Seismic Analysis Details:

Peak Ground Acceleration (PGA) ratio	0.00

Wall Geometry:

Design Wall Height (ft)	9.0
Embedment Wall Height (ft)	1.5
Exposed Design Wall Height (ft)	7.5
Minimum Levelling Pad Thickness (ft)	~~0.5~~ 1.0
Number of Segmental Wall Units	3
Hinge Height (in plane of wall) (ft)	N/A
Wall Inclination (degrees)	3.2

Slopes:

Front Slope (degrees)	33.0
Back Slope (degrees)	horizontal

Reduction Factors:	*Type 1*	*Type 2*	*Type 3*
Creep	1.67	1.75	1.75
Durability	1.10	1.10	1.10
Installation Damage	1.08	1.08	1.08
Overall Factor of Safety	1.50	1.50	1.50

Allowable Strength:	*Type 1*	*Type 2*	*Type 3*
Ta (lbs/ft)	1265.48	3272.41	3272.41

Coefficient of Interaction:	*Type 1*	*Type 2*	*Type 3*
Ci	0.72	0.7	0.7

Coefficient of Direct Sliding:	*Type 1*	*Type 2*	*Type 3*
Cds	0.8	0.85	0.85

Connection Strength:	*Type 1*	*Type 2*	*Type 3*
Ultimate Strength Criterion:			
Minimum (lbs/ft)	1555.0	2233.0	1765.0
Friction Angle (degrees)	16.6	24.3	12.1
Maximum (lbs/ft)	3090.0	6126.0	4690.0
Service State Criterion:			
Minimum (lbs/ft)	806.0	1624.0	1238.0
Friction Angle (degrees)	15.0	22.4	9.5
Maximum (lbs/ft)	2822.0	4065.0	3614.0

Geosynthetic-Segmental Retaining Wall Unit Interface Shear Strength:	*Type 1*	*Type 2*	*Type 3*
Ultimate Strength Criterion:			
Minimum (lbs/ft)	362.0	362.0	362.0
Friction Angle (degrees)	22.4	19.2	20.2
Maximum (lbs/ft)	10115.0	11000.0	7038.0
Service State Criterion:			
Minimum (lbs/ft)	360.0	360.0	360.0
Friction Angle (degrees)	20.5	16.6	17.0
Maximum (lbs/ft)	9450.0	9500.0	6198.0

Coefficients of Earth Pressure and Failure Plane Orientations:

Reinforced Soil (Ka)	0.275
Reinforced Soil (Ka horizontal component)	0.263
Orientation of failure plane from horizontal (degrees)	54.78
Retained Soil (Ka)	0.319
Retained Soil (Ka horizontal component)	0.294
Orientation of failure plane from horizontal (degrees)	50.88

Detailed Results of Facing Stability Analyses (Moment and Shear):

SRW Unit #	Heel Elev (ft)	Geo Type	Drive Moment (lbs-ft/ft)	Resist Moment (lbs-ft/ft)	Shear Load (lbs/ft) +out -in	Shear Capacity (lbs/ft) (peak)	Shear Capacity (lbs/ft) (deformation)
3	6.0	1	450.2	1268.8	351.5	660.8	631.1
2	3.0	2	2416.9	6454.7	368.3	866.9	792.3
1	0.0	none	6824.3	20424.6	0.0	1896.3	1772.5

Detailed Results of Facing Stability Analyses (Connections):

SRW Unit #	Heel Elev (ft)	Geo Type	Connection Load (lbs/ft)	Connection Capacity (peak) (lbs/ft)	Connection Capacity (deformation) (lbs/ft)
3	6.0	1	642.7	1771.1	1000.3
2	3.0	2	1335.8	2887.7	2221.6

WOODARD & CURRAN
Engineering · Science · Operations

CORPORATE OFFICES: Maine, Massachusetts, New Hampshire, New York, Connecticut, Florida, Georgia
Operational offices throughout the U.S.

September 15, 2006

Jean Fraser
City of Portland
389 Congress Street
Portland, ME 04101

Re: Woodard & Curran Building Addition
Major Site Plan Review - Site Plan Modification

Dear Jean:

On behalf of the joint applicants, CADCAM Associates and Peggy and Eric Cianchette, we are submitting 7 copies of an Application for Modification to the Major Site Plan for the Woodard & Curran Building Addition, originally submitted September 21, 2005, and approved by the Planning Board on March 14, 2006. A previous modification was submitted on June 19, 2006, and approved on August 25, 2006.

The purpose of this application for modification is to address modifications to the main entrance to the site. Initially, this modified entrance included a much wider travel way with an island separating inbound and outbound lanes. As a result of comments from you and from Tom Errico, the width of the entrance was revised to the present 24-foot width, as is present in the originally approved Site Plan. The remaining change from the original Site Plan to the present design is the location of the proposed entrance. The revised design is depicted in the attached Sheet C201 Proposed Site Plan. It is our understanding that this revised design has been reviewed by staff and appears to be acceptable.

Approval from the Portland Water District (PWD) is also required in accordance with an agreement, related to the Stroudwater Estates Subdivision, dated October 30, 1979 between the PWD and George M. Hutchins and Harry A. Harmon. A copy of the sketch reviewed by planning staff was also submitted to the PWD for approval. Based on PWD comments, the following changes were made: the culvert running across the relocated main entrance was shifted three feet further from Hutchins Drive in order to prevent a conflict with the existing hydrant; and a note was added to the plans stating that work associated with raising the existing hydrant would be done with PWD supervision. These changes have been reflected in the attached site plan. The PWD has offered verbal approval at this point. Written approval from the PWD will be forwarded to your office upon receipt.

Thank you for your continued assistance with this project. If you have any questions or comments, please do not hesitate to contact me at (207) 797-7515, or via email, kvolock@woodardcurran.com.

Sincerely,
WOODARD & CURRAN INC.

Kenneth Volock

Kenneth Volock, P.E.
Engineer

STATE OF MAINE
KENNETH R. VOLOCK
NO. 11089
REGISTERED PROFESSIONAL ENGINEER

KRV/
203834.01

Enclosure (Drawing): C201 Proposed Site Plan

City of Portland Site Plan Application

If you or the property owner owes real estate or personal property taxes or user charges on any property within the City, payment arrangements must be made before permits of any kind are accepted.

Address of Proposed Development: 41 Hutchins Drive **Zone:** I-M

Total Square Footage of Proposed Structure: 28,450 SF	**Square Footage of Lot:** 289,674 SF

Tax Assessor's Chart, Block & Lot: Chart# Block# Lot# 238A A 1 239 A 4	**Property owner's mailing address:** Cianchette Family LLC 42 Market Street Portland, ME 04101	**Telephone #:** (207) 774-1000
Consultant/Agent, mailing address, phone # & contact person: Woodard & Curran, Inc. 41 Hutchins Drive Portland, Maine 04102 (207) 774-2112 Kenny Volock, Engineer	**Applicant's name, mailing address, telephone #/Fax#/Pager#:** CADCAM Associates 41 Hutchins Drive Portland, ME 04102 (207) 774-2112 Eric & Peggy Cianchette c/o ELC, Inc 42 Market Street Portland, ME 04101 (207) 774-1000	**Project name:** Woodard & Curran Building Addition

Proposed Development (check all that apply)

___New Building _X_Building Addition ___Change of Use ___Residential ___Office ___Retail ___Manufacturing
___Warehouse/Distribution ___Parking lot
___Subdivision ($500.00) + amount of lots____ ($25.00 per lot) $________
___Site Location of Development ($3,000.00)
(except for residential projects which shall be $200.00 per lot__________)
___Traffic Movement ($1,000.00) ___Stormwater Quality ($250.00)
___Section 14-403 Review ($400.00 + $25.00 per lot)
___Other______________________

Major Development (more than 10,000 sq. ft.)

___Under 50,000 sq. ft. ($500.00)
___50,000 - 100,000 sq. ft. ($1,000.00)
___Parking Lots over 100 spaces ($1,000.00)
___100,000 - 200,000 sq. ft. ($2,000.00)
___200,000 - 300,000 sq. ft. ($3,000.00)
___Over 300,000 sq. ft. ($5,000.00)
___After-the-fact Review ($1,000.00 + applicable application fee)

Minor Site Plan Review

___Less than 10,000 sq. ft. ($400.00)
___After-the-fact Review ($1,000.00 + applicable application fee)

Plan Amendments

_X_Planning Staff Review ($250.00)
___Planning Board Review ($500.00)

- Please see next page –

From: Jean Fraser
To: Errico, Thomas
Date: 9/28/2006 2:51:51 PM
Subject: 41 Hutchins Drive- amendment to access drive

Tom,

Yes, I know you e-mailed me with an approval on 9.19.2006 - but:

1. The submitted plan did not have a stop line on the exit lane to Hutchins, as was shown in the plan you approved on 8.30.2006 and also on the original approved layout.

2. On 8.30.06 you asked for stop signs which were not included in the final submitted plan, but you approved the final submitted plan.

So I have told Ken Volock that I considered that you and Jim had thought the final submitted plan was the same as the 8.30 one and that you would have expected the stop line at Hutchins to be included- particularly as that stop line was part of the original layout for that intersection. However, since we approved the original layout for the access with <u>no stop signs</u> I did not ask him to include those. OK??????

Also, are you explicitly approving the new curb cut?

Also I have asked for the street light, shown in the original approved plan as adjacent to the drive, to be relocated so it is in the same relative place for the new location of the drive.

Is all that logical and Ok with you (and Jim)?

thanks
Jean

CC: Carmody, James

Portland Water District
From Sebago Lake to Casco Bay

September 25, 2006

Mr. Kenneth Volock
Woodard & Curran
41 Hutchins Drive
Portland, Maine 04102

Re: Office Expansion Plans

Dear Ken:

On January 24, 2006, Portland Water District staff reviewed and approved the plan for the proposed office expansion you submitted entitled "Proposed Site Plan, Woodard & Curran, Inc, Office Expansion, 41 Hutchins Drive, Portland, Me, Sheet C200 dated January, 2006, subject to the test pit we requested in the vicinity of the driveway crossing to verify the cover over the pipeline. Based on the test pit, the entrance drive was modified as shown on a plan entitled "Revised Entrance Layout, Woodard & Curran, Inc, Office Expansion, 41 Hutchins Drive, Portland, Me, Sheet SKC-05 dated September, 2006. The District has reviewed this revised plan and finds it acceptable to the District. Anything shown on the original plan not modified by this plan shall remain as per the original plan.

If you have any questions or need anything further, do not hesitate to call me at 774-5961 ext. 3057.

Sincerely yours,

PORTLAND WATER DISTRICT

Norman V. Twaddel

Norman V. Twaddel
Right of Way Agent

225 Douglass Street P.O. Box 3553 Portland, Maine 04104-3553
Phone: 207.774.5961 Fax: 207.761.8307 Web: www.pwd.org

From: "Thomas Errico" <terrico@wilbursmith.com>
To: "'Jean Fraser'" <JF@portlandmaine.gov>
Date: 9/19/2006 9:25:28 AM
Subject: Woodard & Curran Building Addition

Jean -

I have reviewed the Site Plan Modification dated September 15, 2006 as it relates to modification of the main entrance on Hutchins Drive. I find the plan to be acceptable and have no further comments.

Thomas A. Errico, P.E.

Senior Transportation Engineer

Wilbur Smith Associates

59 Middle Street

Portland, Maine 04101

(207) 871-1785 Phone

(207) 871-5825 Fax

CC: <JPC@portlandmaine.gov>

From: "Thomas Errico" <terrico@wilbursmith.com>
To: "'Kenneth Volock'" <kvolock@woodardcurran.com>, <JF@portlandmaine.gov>
Date: 8/30/2006 11:43:06 AM
Subject: RE: Revised W&C Entrance

Jean/Ken --

I have reviewed the plan and find it to be acceptable. I would ask that a crosswalk be marked where the sidewalk crosses the main drive and that stop signs be installed where stop bars are illustrated. If you have any questions or comments, please contact me.

Thomas A. Errico, P.E.

Senior Transportation Engineer

Wilbur Smith Associates

59 Middle Street

Portland, Maine 04101

(207) 871-1785 Phone

(207) 871-5825 Fax

emailed to KV

______

From: Kenneth Volock [mailto:kvolock@woodardcurran.com]
Sent: Wednesday, August 30, 2006 7:59 AM
To: JF@portlandmaine.gov; terrico@wilbursmith.com
Cc: jpc@portlandmaine.gov
Subject: Revised W&C Entrance

Jean/Tom,

The attached sketch depicts revisions to our proposed entrance based on feedback from both of you. The revised entrance is now only 24 feet wide and the island has been removed. Please let me know if this concept will be acceptable and what the next step on my part is. My understanding is that, if acceptable, the Contractor would get started on this work within the next couple weeks.

Thanks,

Ken

CC: <jpc@portlandmaine.gov>

From: "Thomas Errico" <terrico@wilbursmith.com>
To: "'Kenneth Volock'" <kvolock@woodardcurran.com>, <JF@portlandmaine.gov>
Date: 8/30/2006 11:43:06 AM
Subject: RE: Revised W&C Entrance

Jean/Ken --

I have reviewed the plan and find it to be acceptable. I would ask that a crosswalk be marked where the sidewalk crosses the main drive and that stop signs be installed where stop bars are illustrated. If you have any questions or comments, please contact me.

Thomas A. Errico, P.E.

Senior Transportation Engineer

Wilbur Smith Associates

59 Middle Street

Portland, Maine 04101

(207) 871-1785 Phone

(207) 871-5825 Fax

From: Kenneth Volock [mailto:kvolock@woodardcurran.com]
Sent: Wednesday, August 30, 2006 7:59 AM
To: JF@portlandmaine.gov; terrico@wilbursmith.com
Cc: jpc@portlandmaine.gov
Subject: Revised W&C Entrance

Jean/Tom,

The attached sketch depicts revisions to our proposed entrance based on feedback from both of you. The revised entrance is now only 24 feet wide and the island has been removed. Please let me know if this concept will be acceptable and what the next step on my part is. My understanding is that, if acceptable, the Contractor would get started on this work within the next couple weeks.

Thanks,

Ken

CC: <jpc@portlandmaine.gov>

Dev Rev Mtg Aug 23, 2006
BN (chair) PL, EL, TErrico, Jim Carmody, Jean

1. Prove why needed compelling/strong
show 2. New scheme better

either deny at staff level + then they can appeal

or to PB w/ negative recommendation

sign would impede sightlines
landscaping + signage opps
for island would be limited
under 2 feet

JF thought width 47' (?) (at least 38')
max is 30'
in Tech Guidelines

likely to be a staff denial (which can be appealed to Planning Board)

or referral to PB with neg. staff rec.

From: "Kenneth Volock" <kvolock@woodardcurran.com>
To: <terrico@wilbursmith.com>, <JF@portlandmaine.gov>
Date: 8/23/2006 9:06:58 AM
Subject: Revised Woodard & Curran Entrance

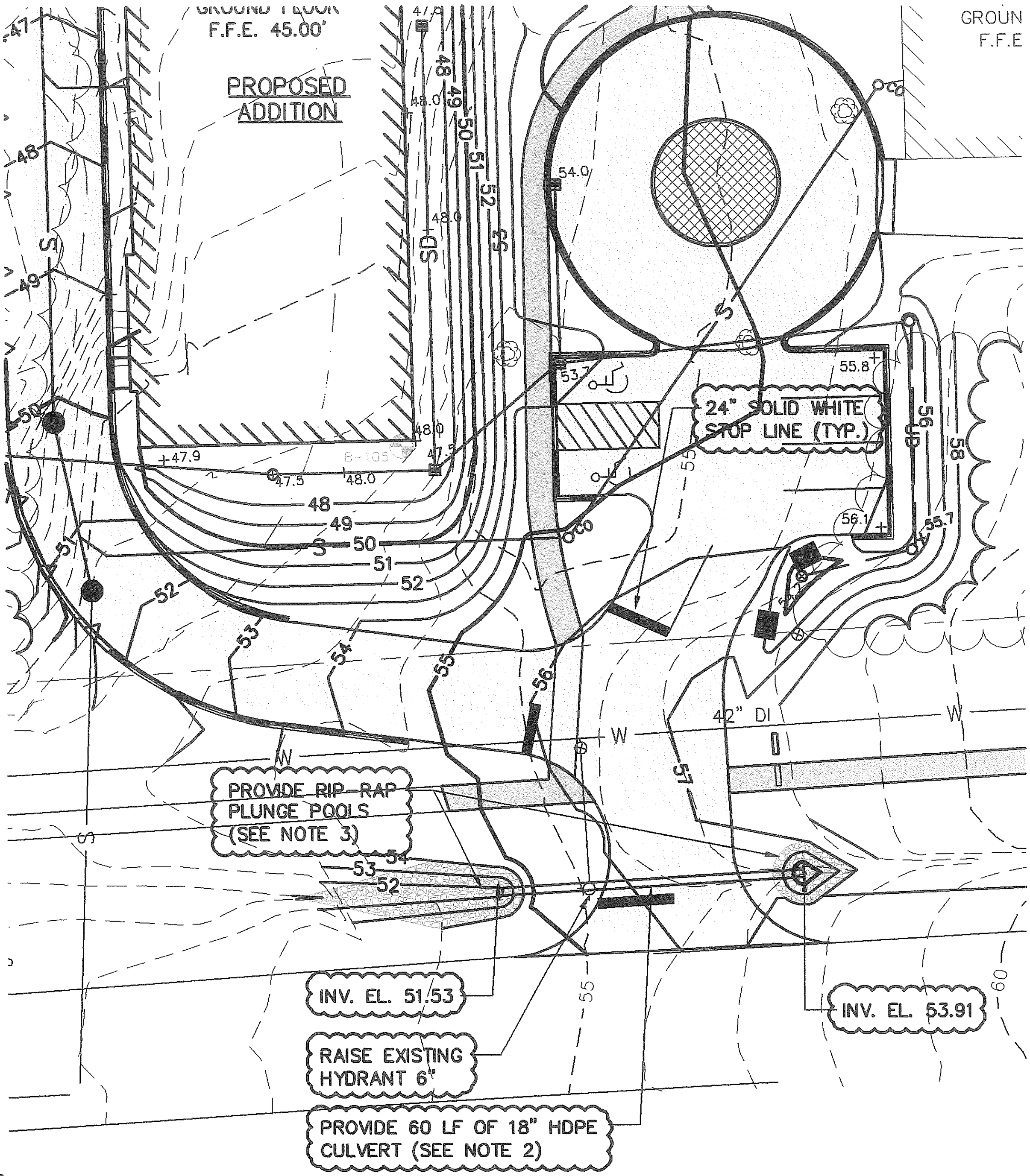
Jean/Tom,

Please see the attached sketch which shows a revised main entrance for the Woodard & Curran building. The present proposed layout is based on conversations between Tom and myself. The entrance and exit lanes are each 15' wide to accommodate larger vehicles turning into and coming out of the access drive that goes around to the rear of the building.

Also, Jean please note that this version involves relocating the fire hydrant at our entrance approximately 15 feet down Hutchins Drive. I have copied Capt. Cass on this email so that he can review this as well.

With the relocation of the hydrant and the loss of about 1 foot of cover over the water main, we need permission from PWD to revise the entrance in this way. I am send this sketch to PWD concurrent with this email.

CC: <jpc@portlandmaine.gov>, <GEC@portlandmaine.gov>



NOTES:

1. THE CHANGES INDICATED ON THIS SKETCH ARE ASSOCIATED WITH THE RELOCATION OF THE MAIN ENTRANCE.
2. BID ALTERNATE: CONTRACTOR SHALL ALSO PRICE AN ALTERNATE FOR 60 LF OF 18" REINFORCED CONCRETE PIPE IN PLACE OF HDPE CALLED OUT ABOVE.
3. RIPRAP PLUNGE POOLS IN THIS SKETCH HAVE BEEN SHOWN LARGER THAN INDICATED IN THE THE DETAILS IN THE ORIGINAL CONSTRUCTION DOCUMENTS DUE TO OBSERVED EROSION IN THE EXISTING DITCH AROUND THE ENTRANCE. RIPRAP PLUNGE POOLS SHALL BE CONSTRUCTED AS INDICATED ON THIS SKETCH.

FOR PRICING

WOODARD & CURRAN Engineering · Science · Operations PORTLAND, MAINE 800-426-4262	REVISED ENTRANCE LAYOUT DESIGNED BY: KRV — CHECKED BY: BSS DRAWN BY: KRV — 20383401-SKC05.dwg	CIANCHETTE FAMILY, LLC PORTLAND, MAINE WOODARD & CURRAN OFFICE EXPANSION	JOB NO: 203834.01 DATE: AUGUST 2006 SCALE: 1" = 30' SKC-05

draft

September 28, 2006

CADCAM Associates
41 Hutchins Drive
Portland, ME 04102

Eric & Peggy Cianchette
c/o ELC, Inc.
42 Market Street
Portland, ME 04101

Kenny Volock, Engineer,
Woodard & Curran, Inc
41 Hutchins Drive
Portland, ME. 04102

RE: 41 Hutchins Drive: Amendments to Approved Plan (Access Drive)
Chart 238A Block A Lot 1; Chart 239 Block A Lot 4
Application #2006-0178

Dear Mr. Volock (on behalf of the joint applicants):

This letter is to confirm that the revisions to the approved site plan for the building addition for Woodard & Curran office expansion, at the above address, have been reviewed and approved. The amendments include the relocation of part of the main access drive where it meets Hutchins Drive, and associated modifications to drainage, lighting and other utilities, as shown on the approved plans.

The approval is based on the submitted revised site plan. If you need to make any further modifications to the approved site plan, you must submit a revised site plan for staff review and approval.

Please submit seven (7) sets of the final drawings and documents, along with a set in electronic form (electronic Autocad files (*.dwg), release 14 or greater).

If there are any questions, please contact Jean Fraser at 874-8728 or jf@portlandmaine.gov.

Sincerely,

Alexander Jaegerman
Planning Division Director

cc.

Lee D. Urban, Planning & Development Department Director
Alexander Jaegerman, Planning Division Director

Sarah Hopkins, Development Review Services Manager
Jean Fraser, Planner
Jay Reynolds, Development Review Coordinator
Marge Schmuckal, Zoning Administrator
Mike Nugent, Director of Inspections
Inspections Division
Michael Bobinsky, Public Works Director
Eric Labelle, City Engineer
Jim Carmody, City Transportation Engineer
Jeff Tarling, City Arborist
Penny Littell, Associate Corporation Counsel
Captain Greg Cass, Fire Prevention, Fire Department
Assessor's Office
Approval Letter File

O:\PLAN\DEVREVW\Hutchins 41 (Woodard & Curran)\Amendment Application2006-0178 (access drive)\Approval letter 41 Hutchins accessamendments September28,2006.doc

Who billing will be sent to: (Company, Contact Person, Address, Phone #)	
Woodard & Curran 41 Hutchins Drive Portland, ME 04102	Attn: Kenny Volock, Engineer (207) 774-2112

Submittals shall include (9) separate folded packets of the following:

a. **copy of application**
b. **cover letter stating the nature of the project**
c. **site plan containing the information found in the attached sample plans check list**

Amendment to Plans: Amendment applications should include 6 separate packets of the above (a, b, & c)

ALL PLANS MUST BE FOLDED NEATLY AND IN PACKET FORM

Section 14-522 of the Zoning Ordinance outlines the process; copies are available at the counter at .50 per page (8.5 x11) you may also visit the web site: ci.portland.me.us chapter 14

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in this application is issued, I certify that the Code Official's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

Signature of applicant: Kenneth Volock	**Date:** 9/15/06

This application is for site review ONLY, a building Permit application and associated fees will be required prior to construction.

Development in Portland

The City of Portland has instituted the following fees to recover the costs of reviewing development proposals under the Site Plan and Subdivision ordinances: application fee; engineering fee; and inspection fee. Performance and defect guarantees are also required by ordinance to cover all site work proposed.

The **Application Fee** covers general planning and administrative processing costs, and is paid at the time of application.

The Planning Division is required to send notices to neighbors upon receipt of an application and prior to public meetings. The applicant will be billed for mailing and advertisement costs. Applicants for development will be charged an **Engineering Review Fee.** This fee is charged by the Planning Division for review of on-site improvements of a civil engineering nature, such as storm water management as well as the engineering analysis of related improvements within the public right-of-way, such as public streets and utility connections, as assessed by the Department of Public Works. The Engineering Review fee must be paid before a building permit can be issued. Monthly invoices are sent out by the Planning Division on a monthly basis to cover engineering costs.

A **Performance Guarantee** will be required following approval of development plans. This guarantee covers all required improvements within the public right-of-way, plus certain site improvements such as landscaping, paving, and drainage improvements. The Planning Division will provide a cost estimate form for figuring the amount of the performance guarantee, as well as sample form letters to be filled out by a financial institution.

An **Inspection Fee** must also be submitted to cover inspections to ensure that sites are developed in accordance with the approved plan. The inspection fee is 2.0% of the performance guarantee amount, or as assessed by the planning or public works engineer. The minimum inspection fee is $300 for development, unless no site improvements are proposed. Public Works inspects work within the City right-of-way and Planning inspects work within the site including pipe-laying and connections. (The contractor must work with inspectors to coordinate timely inspections, and should provide adequate notice before inspections, especially in the case of final inspection.)

Upon completion of a development project, the performance guarantee is released, and a **Defect Guarantee** in the amount of 10% of the performance guarantee must be provided. The Defect Guarantee will be released after a year.

Other reimbursements to the City include actual or apportioned costs for advertising and mailed notices. All fees shall be paid prior to the issuance of any building permit.

For more information on the fees or review process, please call the Planning Division at 874-8719 or 874-8721.

WOODARD & CURRAN
Engineering • Science • Operations

CORPORATE OFFICES: Maine, Massachusetts,
New Hampshire, New York, Connecticut, Florida, Georgia
Operational offices throughout the U.S.

September 15, 2006

Jean Fraser
City of Portland
389 Congress Street
Portland, ME 04101

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Thank you for your continued assistance with this project. If you have any questions or comments, please do not hesitate to contact me at (207) 797-7515, or via email, kvolock@woodardcurran.com.

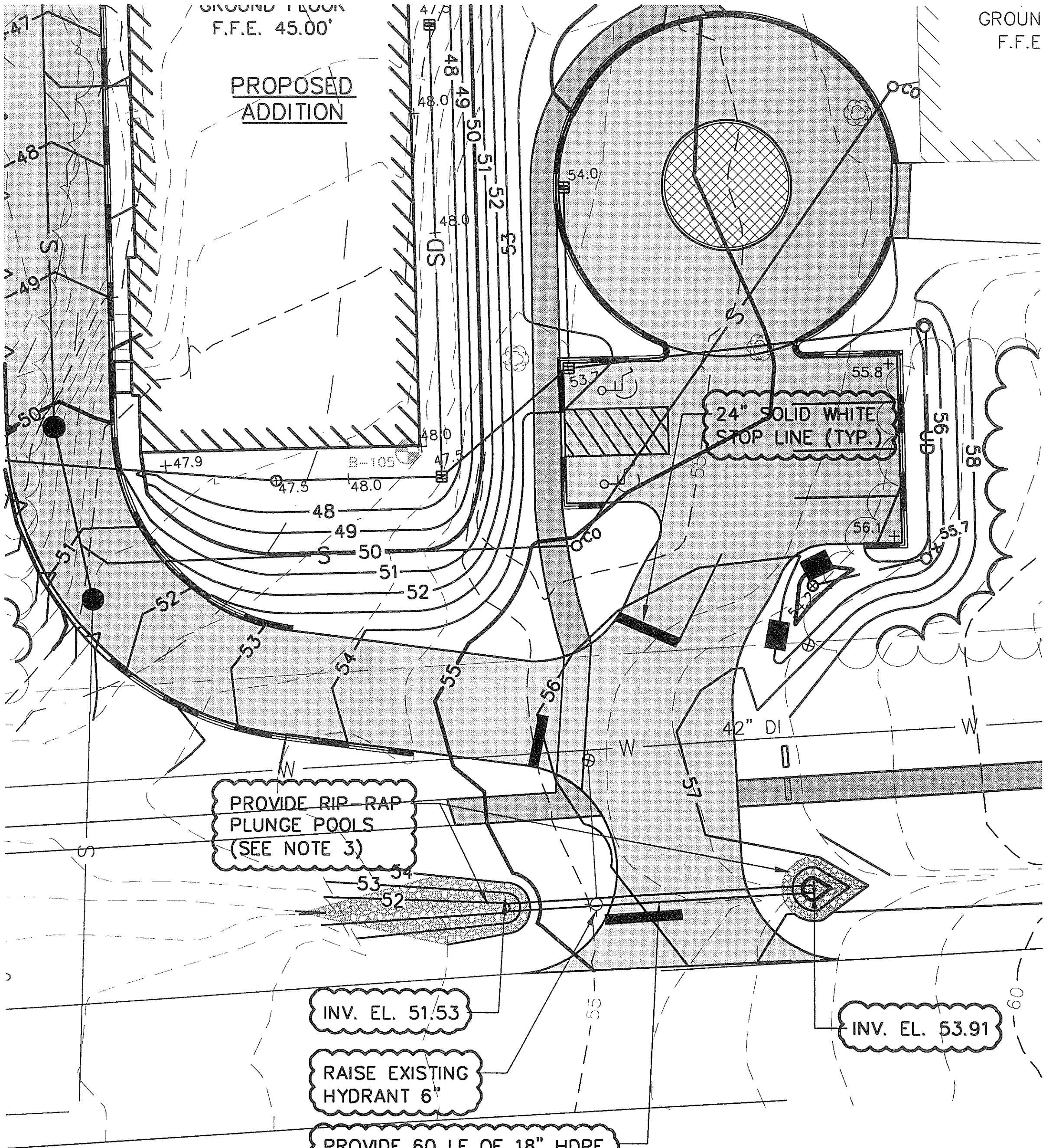
Sincerely,
WOODARD & CURRAN INC.

Kenneth A Volock

Kenneth Volock, P.E.
Engineer

KRV/
203834.01

Enclosure (Drawing): C201 Proposed Site Plan



NOTES:

1. THE CHANGES INDICATED ON THIS SKETCH ARE ASSOCIATED WITH THE RELOCATION OF THE MAIN ENTRANCE.

2. BID ALTERNATE: CONTRACTOR SHALL ALSO PRICE AN ALTERNATE FOR 60 LF OF 18" REINFORCED CONCRETE PIPE IN PLACE OF HDPE CALLED OUT ABOVE.

3. RIPRAP PLUNGE POOLS IN THIS SKETCH HAVE BEEN SHOWN LARGER THAN INDICATED IN THE THE DETAILS IN THE ORIGINAL CONSTRUCTION DOCUMENTS DUE TO OBSERVED EROSION IN THE EXISTING DITCH AROUND THE ENTRANCE. RIPRAP PLUNGE POOLS SHALL BE CONSTRUCTED AS INDICATED ON THIS SKETCH.

FOR PRICING

WOODARD & CURRAN Engineering · Science · Operations PORTLAND, MAINE 800-426-4262	REVISED ENTRANCE LAYOUT	CIANCHETTE FAMILY, LLC PORTLAND, MAINE	JOB NO: 203834.01 DATE: AUGUST 2006 SCALE: 1" = 30'
	DESIGNED BY: KRV / CHECKED BY: BSS DRAWN BY: KRV / 20383401-SKC05.dwg	WOODARD & CURRAN OFFICE EXPANSION	SKC-05

PORTLAND MAINE

Strengthening a Remarkable City, Building a Community for Life www.portlandmaine.gov

Planning and Development Department
Lee D. Urban, Director

Planning Division
Alexander Jaegerman, Director

September 29, 2006

CADCAM Associates
41 Hutchins Drive
Portland, ME 04102

Eric & Peggy Cianchette
c/o ELC, Inc.
42 Market Street
Portland, ME 04101

Kenny Volock, Engineer,
Woodard & Curran, Inc
41 Hutchins Drive
Portland, ME. 04102

RE: 41 Hutchins Drive: Amendments to Approved Plan (Access Drive)
Chart 238A Block A Lot 1; Chart 239 Block A Lot 4
Application #2006-0178

Dear Mr. Volock (on behalf of the joint applicants):

This letter is to confirm that the revisions to the approved site plan for the building addition for Woodard & Curran office expansion, at the above address, have been reviewed and approved. The amendments include the relocation of part of the main access drive where it meets Hutchins Drive, and associated modifications to drainage, lighting and other utilities, as shown on the approved plans.

The approval is based on the submitted revised site plan. If you need to make any further modifications to the approved site plan, you must submit a revised site plan for staff review and approval.

Please submit seven (7) sets of the final drawings and documents, along with a set in electronic form (electronic Autocad files (*.dwg), release 14 or greater).

If there are any questions, please contact Jean Fraser at 874-8728 or jf@portlandmaine.gov.

Sincerely,

Alexander Jaegerman
Planning Division Director

WOODARD & CURRAN
Engineering • Science • Operations

CORPORATE OFFICES: Maine, Massachusetts, New Hampshire, New York, Connecticut, Florida
Operational offices throughout the U.S.

September 29, 2006

Jean Fraser
City of Portland
389 Congress Street
Portland, ME 04101

Re: Woodard & Curran Building Addition
Major Site Plan Review - Site Plan Modification Response to Comments

Dear Jean:

On behalf of the joint applicants, CADCAM Associates and Peggy and Eric Cianchette, we are submitting 7 copies of materials in support of our Application for Modification to the Major Site Plan for the Woodard & Curran Building Addition, submitted September 15, 2006. The Site Plan Application was originally submitted September 21, 2005, and approved by the Planning Board on March 14, 2006. A previous modification was submitted on June 19, 2006, and approved on August 25, 2006.

The purpose of this submission is to address comments related to modifications to the main entrance to the site. Specifically, at the request of Tom Errico, P.E., the traffic reviewing engineer, the stop line at Hutchins Drive has been put back onto the plans and a stop sign has been added at the entrance onto Hutchins Drive. Additionally, the proposed site lighting on either side of the entrance has been shifted as directed by our site lighting designer.

The revised design is depicted in the attached Sheet C201 Proposed Site Plan. An 11"x17" reduced copy of the plan, and a CD with the drawing files in AutoCAD format, have also been attached. It is our understanding that pending these final changes, this revised design has been approved by staff.

Thank you for your continued assistance with this project. If you have any questions or comments, please do not hesitate to contact me at (207) 797-7515, or via email, kvolock@woodardcurran.com.

Sincerely,
WOODARD & CURRAN INC.

Kenneth Volock, P.E.
Engineer

STATE OF MAINE
KENNETH R. VOLOCK
NO. 11062
REGISTERED PROFESSIONAL ENGINEER

KRV/
203834.01

Enclosures: C201 Proposed Site Plan
C201 Proposed Site Plan (11x17 Reduced Copy)
CD with files in AutoCAD format

Planning and Development Department
Lee D. Urban, Director

Planning Division
Alexander Jaegerman, Director

Mr. Eric Cianchette
Cianchette Family LLC
42 Market Street
Portland, ME 04102

August 24, 2006

RE: 34 Hutchins Drive
CBL: 238A-B-003
2006 - 0131

Dear Mr. Cianchette

On August 24, 2006, the Portland Planning Authority approved the temporary parking/construction work yard at 34 Hutchins Drive as shown on the submitted plan with the following conditions:

1. The temporary parking/construction work yard is approved until ***May 15, 2008***.

2. Prior to ***May 15, 2008***, the site will be reverted back to a natural state, which includes, but is not limited to:
   A. Removal of gravel, loam and seed over areas that were once graveled.
   B. Removal of curb cut/construction entrance, loam and seed over this area.
   C. Other stabilization and landscaping measures, as needed.

3. Immediately perform the following recommendations made by Gorrill-Palmer Consultant Engineers:
   A. Touch up/complete wood waste berm in areas where there were gaps in the berm,
   B. Mulch all disturbed areas,
   C. Install a temporary riser on the culvert above the sewer easement to create a sedimentation basin.

4. If use of the site is anticipated to continue beyond ***May 15, 2008***, you are required to submit a complete site plan application for permanent use of the site by ***February 15, 2008***. The permanent site plan application must be consistent with the proposed use and include provisions for all required improvements, including but no limited to granite curbing, sidewalk, landscaping, stormwater control, and site lighting.

5. The performance guarantee that currently exists for #41 Hutchins Drive project shall be used to ensure that the site is constructed according to the submitted site plan and compliance is made to these conditions.

MOHR & SEREDIN
Landscape Architects, Inc.

October 10, 2006

COPY

Ms. Mary Beth Richardson
Maine Department of Environmental Protection
312 Canco Road
Portland Maine 04103

RE: Permit By Rule and Site Location of Development Modification Application
34 Hutchins Drive, Portland, Me
Cianchette Family LLC

Dear Mary Beth,

Per our telephone conversation last week, please find attached three (3) copies of the plans and supporting information for the discussed after-the-fact Permit-By-Rule application and Site Location of Development Modification Application for construction activity adjacent to a protected natural resource. The proposed work is for the construction of a 9,800 square foot temporary gravel parking/construction work yard at 34 Hutchins Drive, Portland, Maine. The applicant proposes to use this parcel for temporary contractor parking and as a staging area for construction activity associated with the Woodard & Curran building on the east side of Hutchins Drive.

Grading is necessary within 75' of a protected natural resource based on the existing topography and lot configuration. Total disturbance for the site is under one-half acre (20,972 S.F.) in size and does not require a Maine Construction General Permit NOI. As discussed, we are respectfully requesting a temporary PBR to mirror the local permit issued by the Portland Planning Authority during late August of this year.

As a recap, the Portland Planning Authority has approved the temporary parking/construction work yard through May 15, 2008. The owner must return the site to its natural vegetative state by removal of gravel, curb cut (entrance) and landscape as necessary. If use of the site will extend beyond the aforementioned date, a full site plan application and necessary DEP applications will be filed with both the City of Portland and the Maine Department of Environmental Protection. A copy of the City Approval is enclosed as Exhibit F.

Existing Conditions and Environmental Issues

The lot size is 2.75 acres with 307-feet of frontage on Hutchins Drive. The parcel is Lot 9 of the original Stroudwater Estates Subdivision, which was approved by the City of Portland in 1984. A 30-foot drainage easement bisects the site; this easement and associated swale provide drainage for the southerly abutting lots. A 30-foot sewer right-of-way crosses the site (see L1.0) and contains the sanitary drain line of the southerly abutting property. The site is required to comply with the requirements of the of Maine Department of Environmental Protection order #L-010223-39-F-M, dated March 19, 1986.

A stream bisects the lot and is contained within a 30' wide drainage easement established by the Subdivision Plan. An eroded drainage swale is also on the lot, originating from the run-off from the

18 Pleasant Street, Portland, Maine 04101
(207) 871-0003

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Planning & Urban Development Department
Penny St. Louis Littell, Director

Planning Division
Alexander Jaegerman, Director

TO: Ellen Sanborn, Finance Department

FROM: Alexander Jaegerman, Planning Division Director

DATE: November 30, 2009

SUBJECT: Request for Release of Defect Guarantee
Woodard & Curran Addition, 41 Hutchins Drive
(ID# 2005-0225)   (Lead CBL#238A A 1; 239 A 4)
(Cianchette Family LLC)

Please release the Letter of Credit account #176 dated May 15, 2006 for the Woodard & Curran Building Addition at 41 Hutchins Drive.

Remaining Balance $32,709.30

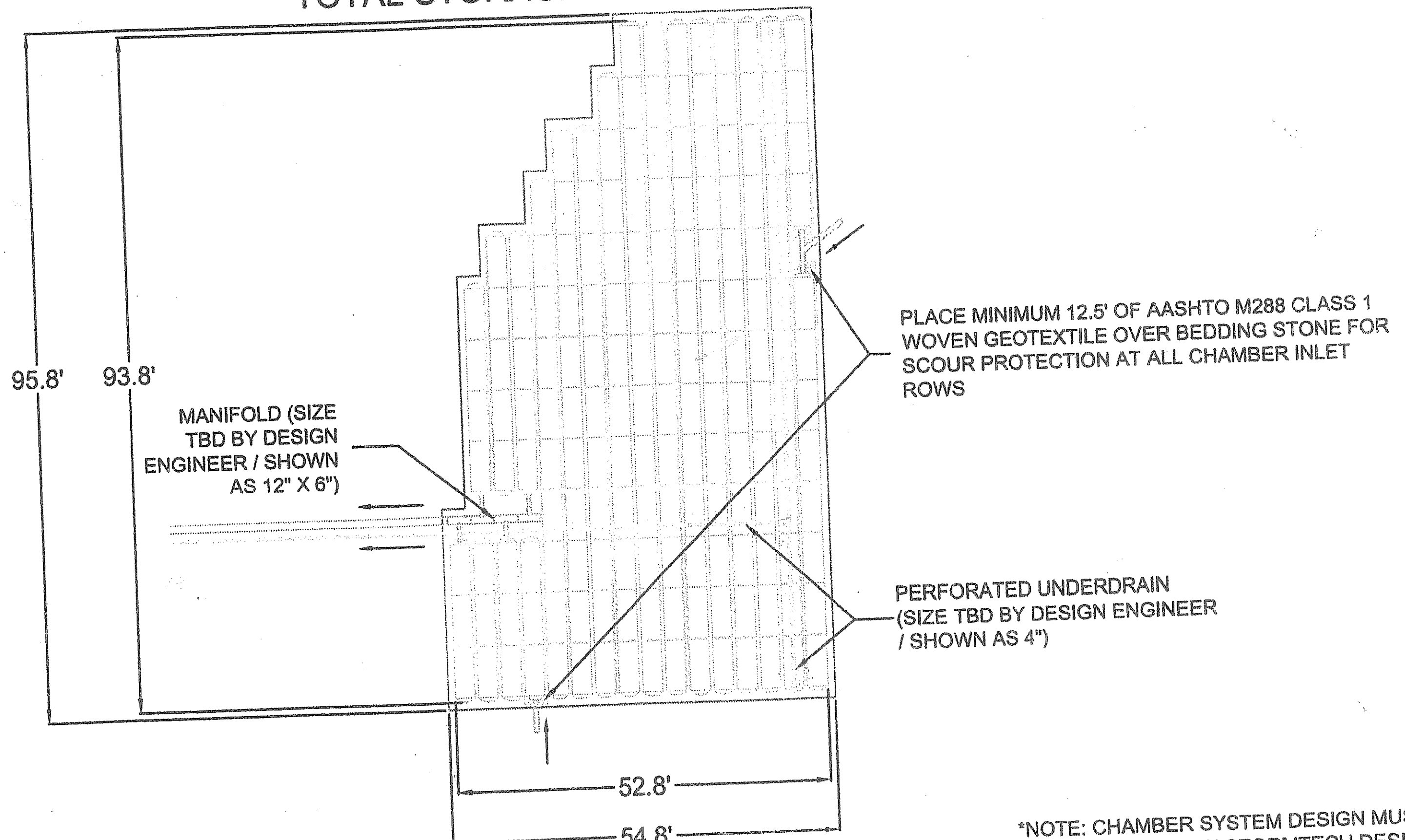
Approved:

Alexander Jaegerman
Planning Division Director

cc: Barbara Barhydt, Development Review Services Manager
Philip DiPierro, Development Review Coordinator
File: Urban Insight

O:\PLAN\DRC\Projects\Hutchins 41\Release Defect Guarantee 11-30-09.doc

173 SC-310 STORMTECH CHAMBERS
14.7 CF OF STORAGE PER BARE CHAMBER - 2543 CF
STORAGE IN STONE (INCLUDING PERIMETER STONE) w/ 10" STONE BELOW CHAMBERS / 11" STONE ABOVE CHAMBERS / 40% STONE VOID - 4560 CF
TOTAL STORAGE PROVIDED - 7103 CF



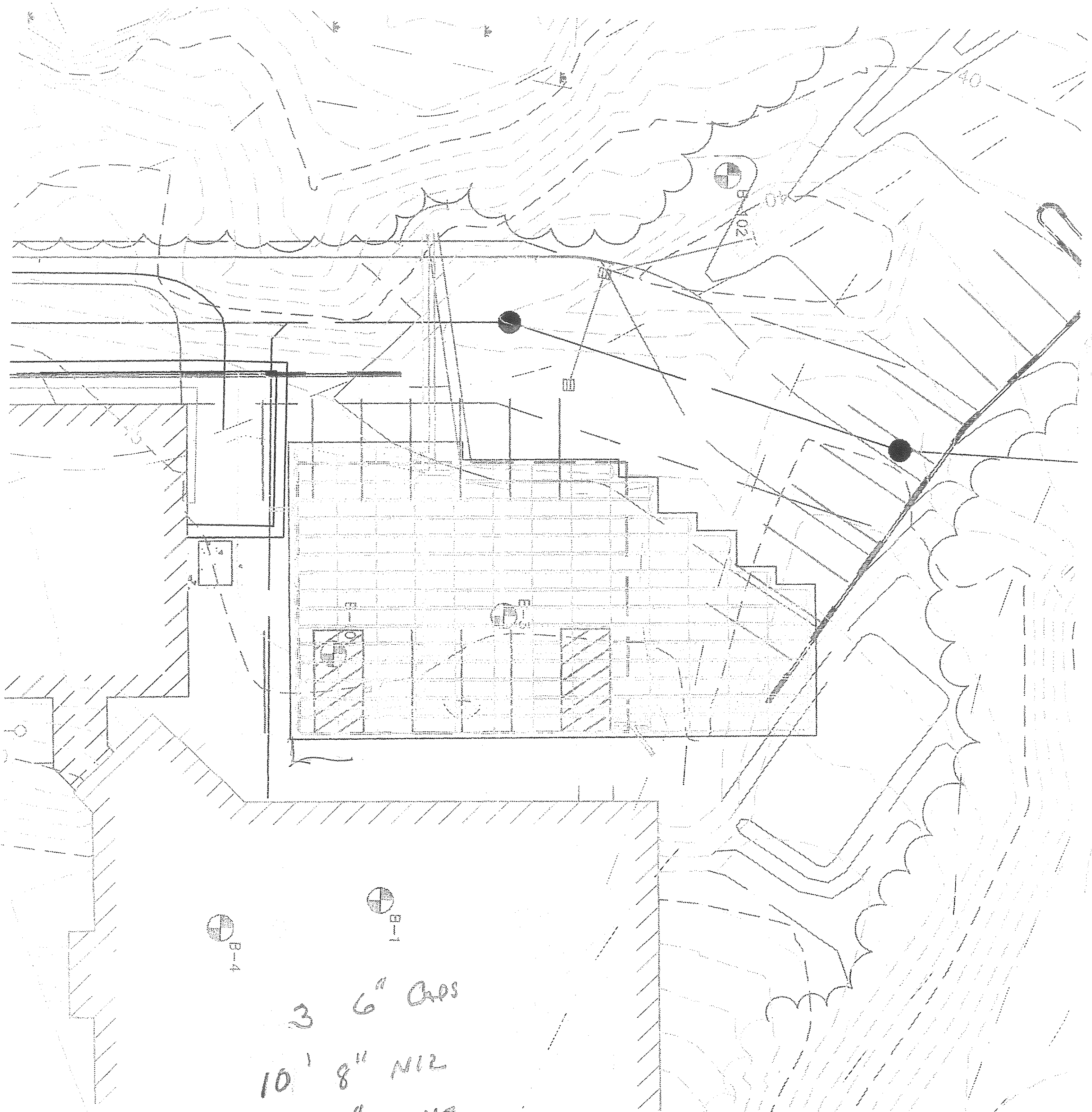
*NOTE: CHAMBER SYSTEM DESIGN MUST BE IN ACCORDANCE WITH STORMTECH DESIGN MANUAL

STORMTECH LLC CONCEPTUAL PLAN DISCLAIMER

THIS STORMTECH CHAMBER SYSTEM LAYOUT WAS PRODUCED TO DEMONSTRATE A BED LAYOUT THAT WILL HANDLE THE DESIGN VOLUME LISTED ABOVE. THE SIZING, FIT AND APPLICABILITY OF THE STORMTECH CHAMBER SYSTEM FOR THIS SPECIFIC PROJECT HAS NOT BEEN DETERMINED. IT IS THE ULTIMATE RESPONSIBILITY OF THE DESIGN ENGINEER TO ASSURE THAT THE STORMWATER SYSTEM DESIGN IS IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. STORMTECH PRODUCTS MUST BE DESIGNED AND INSTALLED IN ACCORDANCE WITH STORMTECH'S MINIMUM REQUIREMENTS. STORMTECH LLC DOES NOT APPROVE PLANS, SIZING, OR SYSTEM DESIGNS. THE DESIGNING ENGINEER IS RESPONSIBLE FOR ALL DESIGN DECISIONS.

StormTech Detention•Retention•Recharge
Subsurface Stormwater Management™
20 Beaver Road, Suite 104
Wethersfield, CT 06109
Phone: 888-892-2694
Fax: 866-328-8401
www.stormtech.com

WOODARD & CURRAN			
SCALE:	NTS	CHECKED	
DATE:	5/26/2006	ACAD No.	
DRAWN BY:	MDK	SHEET	OF



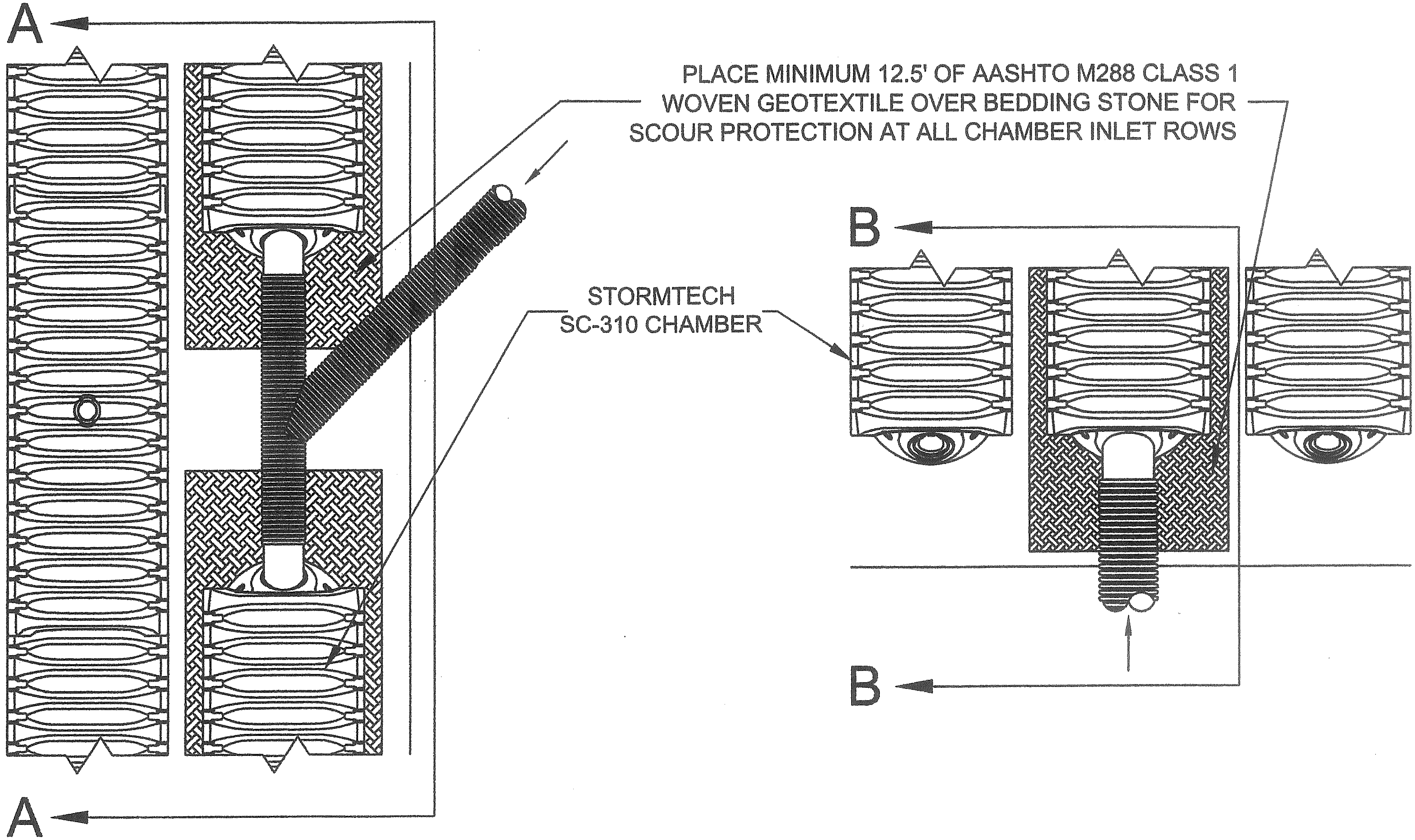
3 6" CAPS

10' 8" N12

1 8" WYE

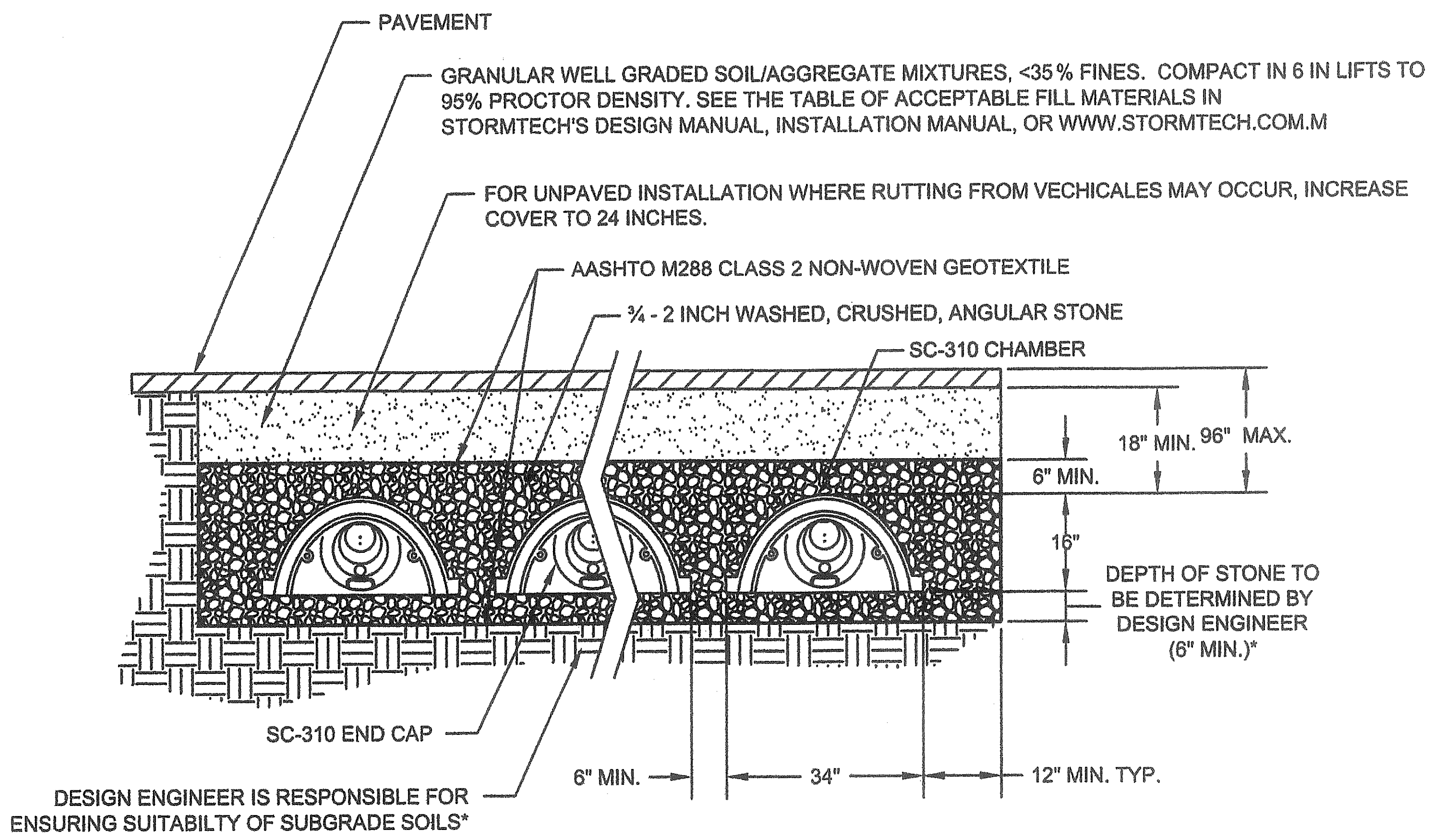
1 8" 45°

1 8" FLANGE



ST 5.0

INLET PLAN VIEW DETAIL

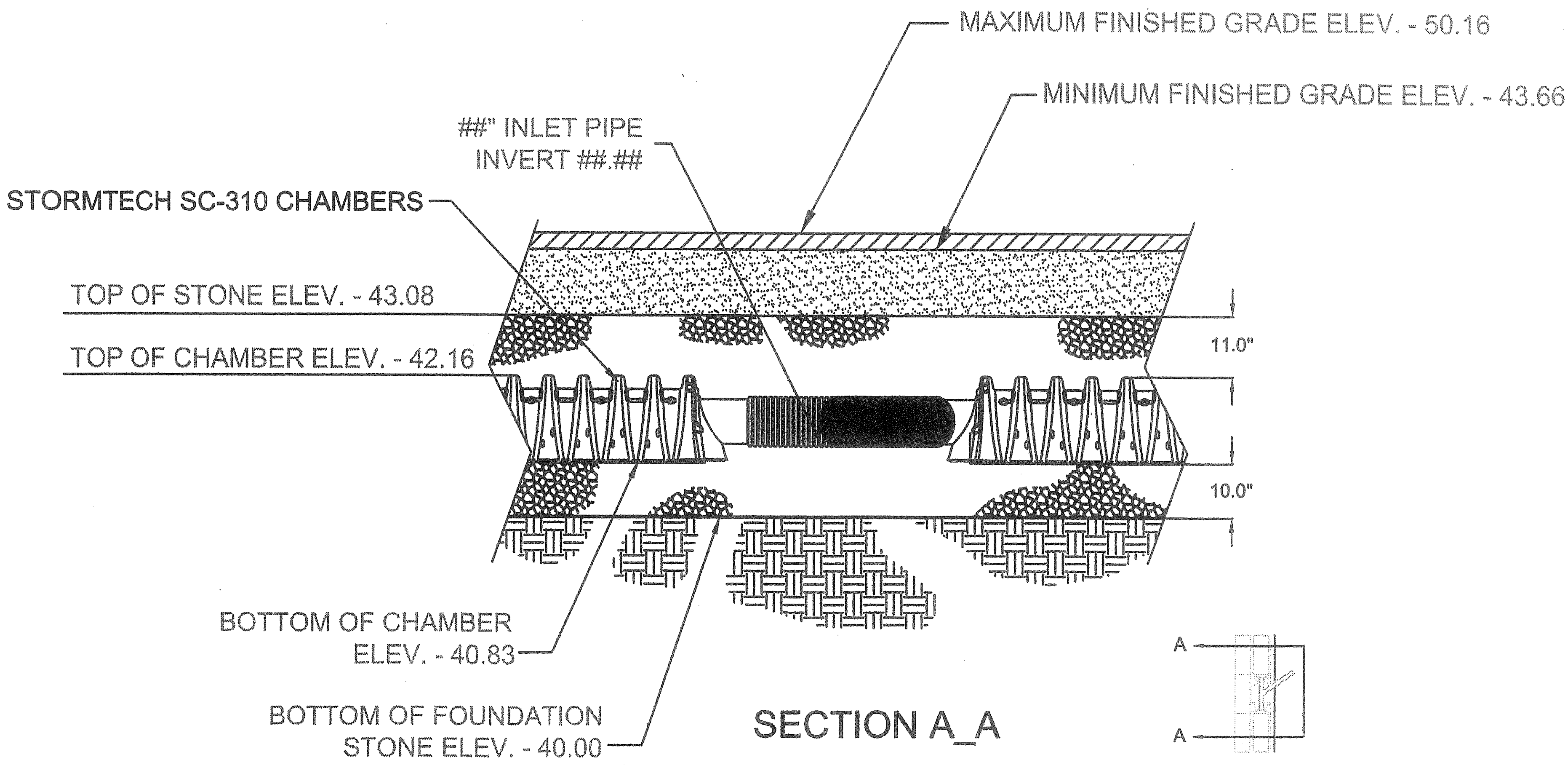


FOR STORMTECH
INFORMATION CALL 1-888-892-2694

STORMTECH SC-310 CHAMBER SYSTEM
TYPICAL CROSS SECTION DETAIL

NOT TO SCALE

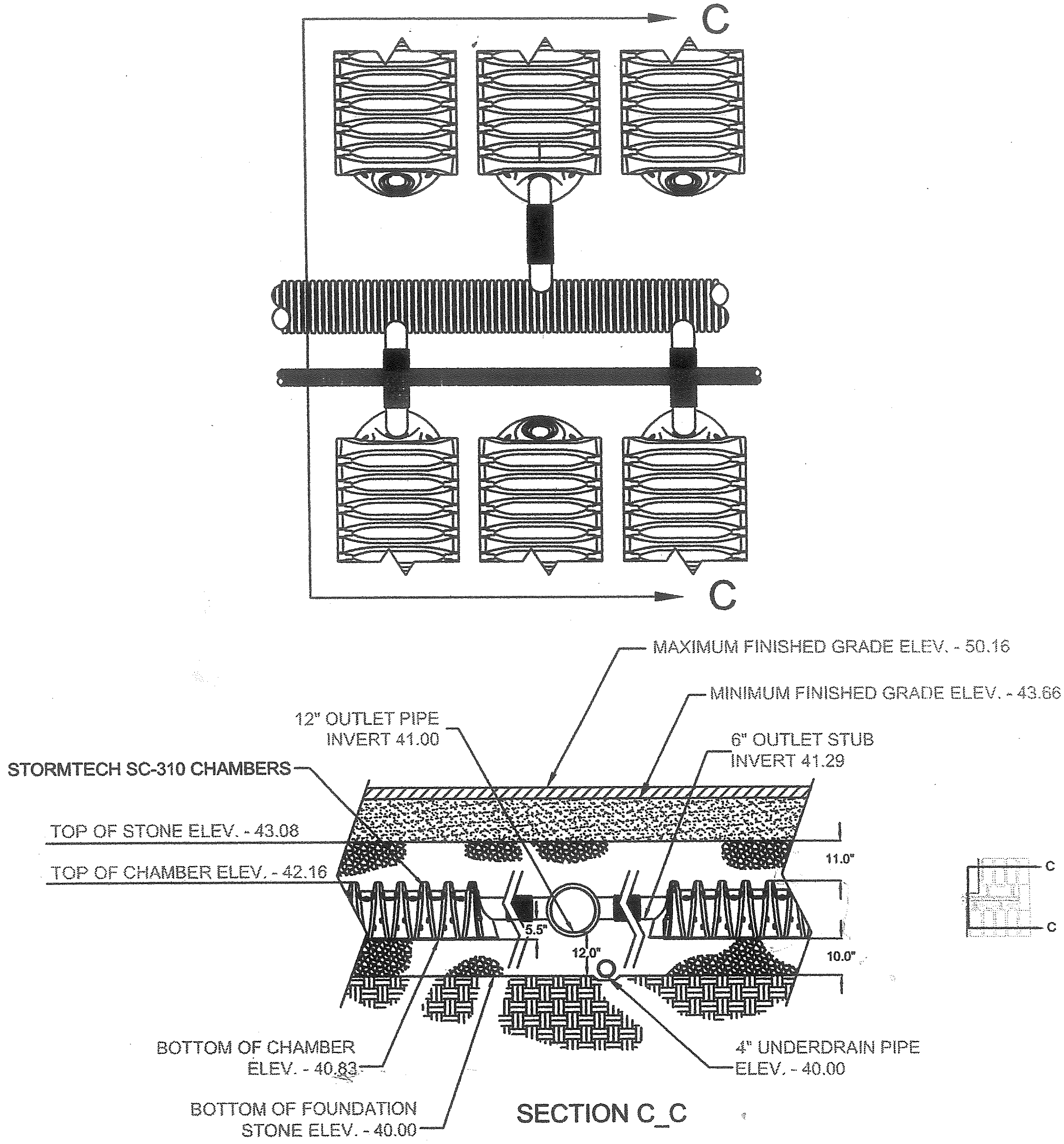
* SEE STORMTECH'S DESIGN MANUAL



SECTION A_A

ST 6.0

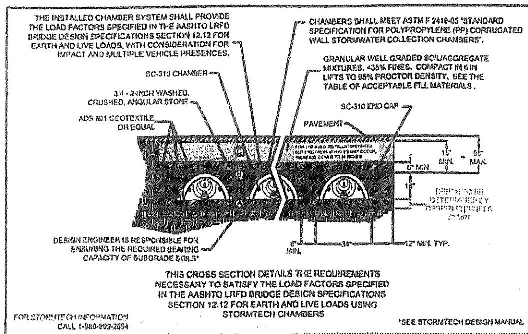
INLET ELEVATIONS AND DETAILS



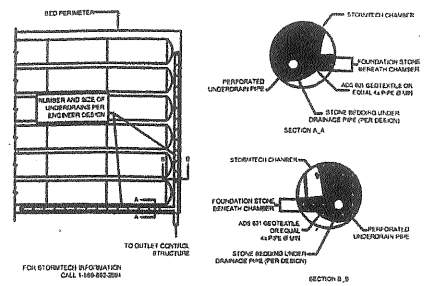
SECTION C_C

ST 8.0

OUTLET ELEVATIONS AND DETAILS

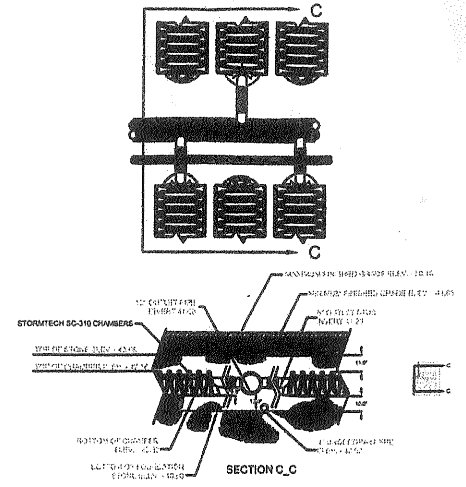


ST 1.0 **SC-310 TYPICAL CROSS SECTION**

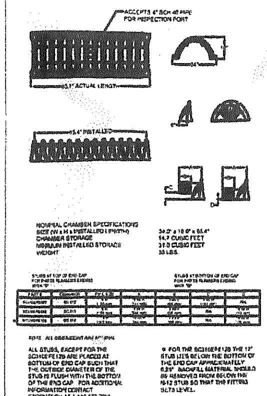


ST 2.0 **STORMTECH UNDERDRAIN DETAIL**

NOTES:
1. ALL DESIGN SPECIFICATIONS FOR STORMTECH CHAMBERS SHALL BE IN ACCORDANCE WITH THE STORMTECH DESIGN MANUAL.
2. THE INSTALLATION OF STORMTECH CHAMBERS SHALL BE IN ACCORDANCE WITH THE LATEST STORMTECH INSTALLATION INSTRUCTIONS.
3. THE CONTRACTOR IS ADVISED TO REVIEW AND UNDERSTAND THE INSTALLATION INSTRUCTIONS PRIOR TO BEGINNING SYSTEM INSTALLATION. CALL 1-888-892-2694 OR VISIT WWW.STORMTECH.COM TO RECEIVE A COPY OF THE LATEST STORMTECH INSTALLATION INSTRUCTIONS.
4. CHAMBERS SHALL MEET THE DESIGN REQUIREMENTS AND LOAD FACTORS SPECIFIED IN SECTION 12.12 OF THE LATEST EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.



ST 8.0 **OUTLET ELEVATIONS AND DETAILS**



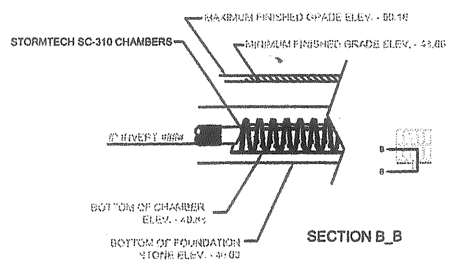
ST 9.0 **TECHNICAL DETAILS**

ACCEPTABLE FILL MATERIALS
STORMTECH SC-310 CHAMBER SYSTEMS

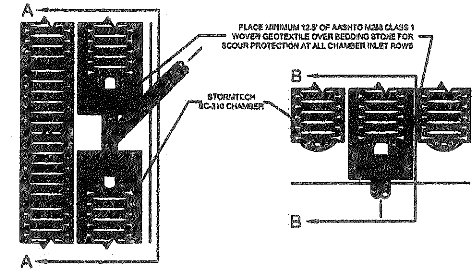
MATERIAL LOCATION	DESCRIPTION	AASHTO M43 DESIGNATION	AASHTO M145 DESIGNATION	COMPACTION/DENSITY REQUIREMENT
FILL MATERIAL FROM 18" TO GRADE ABOVE CHAMBERS	ANY SOIL/ROCK MATERIALS, NATIVE SOILS OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	N/A	PREPARE PER ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
(C) FILL MATERIAL FOR 6" TO 18" ELEVATION ABOVE CHAMBERS (24" FOR UNPAVED INSTALLATIONS)	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES.	3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	A-1 A-2 A-3	COMPACT IN 6" LIFTS TO A MINIMUM 95% STANDARD PROCTOR DENSITY. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 LBS. DYNAMIC FORCE NOT TO EXCEED 20,000 LBS.
(B) EMBEDMENT STONE SURROUNDING AND TO A 6" ELEVATION ABOVE CHAMBERS	WASHED ANGULAR STONE WITH THE MAJORITY OF PARTICLES BETWEEN ¾ - 2 INCH	3, 357, 4, 467, 5, 56, 57	N/A	NO COMPACTION REQUIRED
(A) FOUNDATION STONE BELOW CHAMBERS	WASHED ANGULAR STONE WITH THE MAJORITY OF PARTICLES BETWEEN ¾ - 2 INCH	3, 357, 4, 467, 5, 56, 57	N/A	PLATE COMPACT OR ROLL TO ACHIEVE A 95% STANDARD PROCTOR DENSITY

PLEASE NOTE: THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE WASHED CRUSHED ANGULAR. FOR EXAMPLE, THE STONE MUST BE SPECIFIED AS WASHED, CRUSHED, ANGULAR NO. 4 STONE.

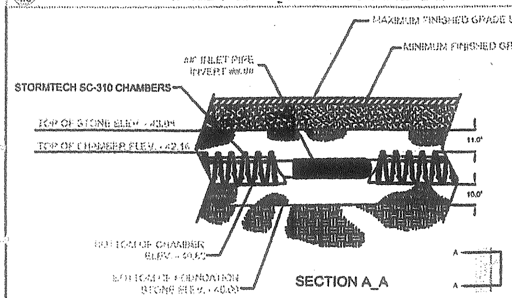
ST 3.0 **STORMTECH ACCEPTABLE FILL MATERIALS**



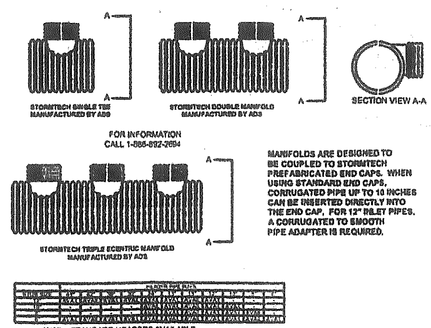
ST 4.0 **INLET ELEVATIONS AND DETAILS**



ST 5.0 **INLET PLAN VIEW DETAIL**



ST 6.0 **INLET ELEVATIONS AND DETAILS**



ST 7.0 **ADS MANIFOLD DETAILS**

173 SC-310 STORMTECH CHAMBERS
14.7 CF OF STORAGE PER BARE CHAMBER - 2543 CF
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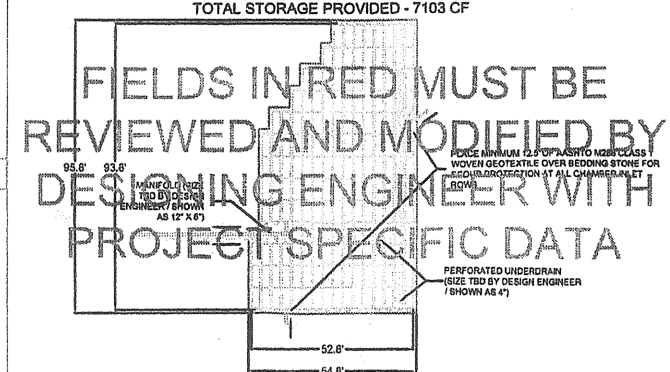

CHAMBERS SHALL MEET THE DESIGN REQUIREMENTS AND LOAD FACTORS SPECIFIED IN SECTION 12.12 OF THE LATEST EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS LOADS SHALL BE CALCULATED IN ACCORDANCE WITH SECTION 3 AND SHALL INCLUDE H20 DESIGN TRUCK, IMPACT FACTOR, MULTIPLE PRESENCE, AND LANE LOAD.

ST 10.0 **STORMTECH SC-310 CHAMBER LAYOUT**

StormTech Detention•Retention•Recharge
Subsurface Stormwater Management™

PROJECT NAME
WOODARD & CURRAN

This drawing was prepared to support the design engineer for the proposed conversion. It is the ultimate responsibility of the design engineer to assure that the stormwater system's design is in full compliance with all applicable laws and regulations. It is the design engineer's responsibility to ensure that the StormTech products are designed in accordance with StormTech's minimum requirements. StormTech LLC does not approve plans, sizing, or system designs. The designing engineer is responsible for all design decisions.

REVISIONS	DATE

STORMTECH, LLC
20 BEAVER ROAD, STE 104
WETHERSFIELD, CT 06109
tel. 888-892-2694
fax 866-328-8401
WWW.STORMTECH.COM

DRAWING TITLE
SC-310
PLAN
LAYOUT

STORMTECH SC-310 CHAMBER DETAIL SHEET

41 Hutchins Drive: Building Addition for Woodard & Curran; Conditions approved march 14, 2006

done 8/24/07 i. That the applicant receives the required permits from the MDEP prior to the issuance of a building permit or any site work alterations.

done 5/18/06 ii. That the applicant shall contribute $5000 to an account that would be used to fund traffic improvements to the intersection at Hutchins Drive / Congress Street. If part or all of the contribution remains unused, or is determined not to be required, within ten years after the issuance of the Certificate of Occupancy, the unexpended portion of the contribution funds shall be returned to the applicant.

done 8/27/07 iii. The applicant shall submit a Snow Removal and Maintenance Plan for the 20 foot wide roadway adjacent to the new building to the satisfaction of the Traffic Engineer and the Development Review Coordinator (Jim Seymour of Sebago Technics). The Snow Removal and Maintenance Plan to show how this access will be maintained and kept free of obstructions to ensure fire access if needed.

done 8/24/07 iv. The applicant shall adhere to the Inspection and Maintenance Procedures set out in the Stormwater Management Addendum submitted for the subsurface detention structure and vegetated swale, and the Erosion and Sedimentation Control Plan (including Plan C200) submitted February 23, 2006.

done done done

done 4/30/09 v. The applicant shall present the sidewalk, drainage and sewer easements for final review and approval by Corporation Counsel, including evidence of an appropriate easement in relation to the water main blow-off valve discharge pipe.

done vi. The applicant shall submit details of the sidewalk extension and sewer diversion, which must be in accordance with the City Standards and directly reviewed and approved by Public Works.

done? wall is built 8/24/07 ~~vii.~~ The applicant to adhere to the submitted Geotechnical Report during construction and involve a Geotechnical Engineer at regular intervals during the construction of foundations and retaining walls; also to amend the plans to reference the construction measures required for such foundation and retaining wall construction. The final retaining wall design shall be designed by a professional engineer and reviewed and approved by the code enforcement officer and Development Review Coordinator.

Check w/ Jeff.

done
8/30/07
Jeff is ok with
grass creep planting

viii. The applicant shall discuss and agree an alternative treatment of the central area of the turning circle at the main entrance with the City Arborist.

done
8/24/07

ix. That in view of the sensitive nature of this site and its proximity to wetland areas, as a condition of this approval there shall be no further expansion or development of parking areas or commercial space outside of the existing building footprint or impervious surface areas approved herein.

x. [another one re Purchase and Sale Agreement]

[two waivers granted- wording to be added]

[Original approval letter dated March 28, 2006 and referring to PB approvals of March 14, 2006 was accidentally deleted but these are correct conditions]

From: Barbara Barhydt
To: Barry Sheff
Date: 6/20/2007 12:11:11 PM
Subject: change in parking spaces for Woodard and Curran

Hello:

The Woodard and Curran proposal to eliminate one handicapped space and replace it with two compact spaces was approved at the development review meeting today (June 20, 2007). We will stamp the plan approved and include it in the project file.

Thank you.

Barbara Barhydt
Development Review Services Manager
Planning Division
389 Congress Street 4th Floor
Portland, ME 04101
(207) 874-8699
Fax: (207) 756-8256
bab@portlandmaine.gov

CC: DiPierro , Philip; Fraser, Jean

CITY OF PORTLAND, MAINE
PLANNING BOARD

Kevin Beal, Chair
Michael Patterson, Vice Chair
John Anton
Lee Lowry III
Shalom Odokara
David Silk
Janice E. Tevanian

March 28, 2006

CADCAM Associates
41 Hutchins Drive
Portland, ME 04102

Eric and Peggy Cianchette
c/o ELC, Inc.
42 Market Street
Portland, ME 04101

Kenneth Volock
Woodard & Curran, Inc.
41 Hutchins Drive
Portland, ME 04102

RE: 41 Hutchins Drive – Building Addition for Woodard & Curran Office Expansion
CBL: Chart 238A, Block A, Lots 1 and Chart 239, Block A, Lot 4
Application Number: 2005-0225.

Dear Mr Volock (on behalf of the joint applicants):

On March 14, 2006, the Portland Planning Board voted on the following motions for the proposal for a building addition at 41 Hutchins Drive.

1. The Planning Board voted unanimously (4-0, Patterson, Odokara and Tevanian absent) to grant the following site plan waivers:

   i. That the Planning Board waives the Technical Standard (Section III 2 A.(b)), which requires a 24 foot wide driveway for two-way ingress and egress, to allow the driveway alongside the proposed new building (excluding where it meets Hutchins Drive to the point of branching off) to be 20 feet wide in order to minimize impact on the nearby wetland area.

   ii. That the Planning Board waives the Technical Standard set out in Ordinance Sections 14-498 and 14-499 which requires granite curbs, as curbing along the frontage of this site would result in the loss of landscaped swales, and runoff does not require curbing for stormwater management.

2. The Planning Board voted unanimously (4-0, Patterson, Odokara and Tevanian absent) to approve the site plan for the above referenced application. The approval was granted for the project with the following condition(s):

ix. That in view of the sensitive nature of this site and its proximity to wetland areas, as a condition of this approval there shall be no further expansion or development of parking areas or commercial space outside of the existing building footprint or impervious surface areas approved herein.

x. The applicants represented that the purchase and sale agreement has been extended, and shall submit a copy of the extended agreement evidencing that the contract is still in effect by Friday this week (March 17th, 2006).

The approval is based on the submitted site plan and the findings related to site plan review standards as contained in Planning Report #10-06, Planning Board Memorandum of March 14, 2006 and Planning Board Addendum of March 14, 2006, which are attached.

Please note the following provisions and requirements for all site plan approvals:

1. Where submission drawings are available in electronic form, the applicant shall submit any available electronic Autocad files (*.dwg), release 14 or greater, with seven (7) sets of the final plans.

2. A performance guarantee covering the site improvements as well as an inspection fee payment of 2.0% of the guarantee amount and 7 final sets of plans must be submitted to and approved by the Planning Division and Public Works prior to the release of the building permit. If you need to make any modifications to the approved site plan, you must submit a revised site plan for staff review and approval.

3. The site plan approval will be deemed to have expired unless work in the development has commenced within one (1) year of the approval or within a time period agreed upon in writing by the City and the applicant. Requests to extend approvals must be received before the expiration date.

4. A defect guarantee, consisting of 10% of the performance guarantee, must be posted before the performance guarantee will be released.

5. Prior to construction, a pre-construction meeting shall be held at the project site with the contractor, development review coordinator, Public Work's representative and owner to review the construction schedule and critical aspects of the site work. At that time, the site/building contractor shall provide three (3) copies of a detailed construction schedule to the attending City representatives. It shall be the contractor's responsibility to arrange a mutually agreeable time for the pre-construction meeting.

6. If work will occur within the public right-of-way such as utilities, curb, sidewalk and driveway construction, a street opening permit(s) is required for your site. Please contact Carol Merritt at 874-8300, ext. 8828. (Only excavators licensed by the City of Portland are eligible.)

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE HOUSE STATION 17 AUGUSTA, MAINE 04333

DEPARTMENT ORDER

IN THE MATTER OF

CADCAM ASSOCIATES/ELC, INC.	) SITE LOCATION OF DEVELOPMENT ACT
Portland, Cumberland County	)
OFFICE BUILDING EXPANSION	) MINOR AMENDMENT
L-10223-39-Q-B (approval)	) FINDINGS OF FACT AND ORDER

Pursuant to the provisions of 38 M.R.S.A. Sections 481 et seq., the Department of Environmental Protection has considered the application of CADCAM ASSOCIATES with the supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

1. PROJECT DESCRIPTION:

A. History of Project: In Department Order #39-3190-05170, dated July 30, 1979, the Department approved the development of an industrial park known as Stroudwater Estates, Phase I. Phase I consisted of eight lots on an approximately 130-acre parcel of land. Department Order #L-10223-86-A-N, dated June 14, 1984, approved the development of Phase II of Stroudwater Estates, which consisted of an additional twelve lots. In Department Order #L-10223-39-K-N, dated November 20, 1992, the Department approved Stroudwater Estates Phase III. The Phase III approval lapsed, and in Department Order #L-10223-39-O-M, dated April 2, 2002, the Department approved the addition of an 85-acre parcel to the subdivision as an unbuildable lot.

B. Summary: The applicants own Lots 15 and 16 of Stroudwater Estates Phase II, and propose to construct a three-story building addition with a footprint of approximately 7,560 square feet, an addition to a parking lot on the northerly portion of the site, new parking at the rear of the building, a new access drive, and a redesigned plaza and walkway in the center of the site. The proposed project is shown on a set of 14 plans, the first of which is entitled "CADCAM Associates – Portland, Maine – Woodard & Curran Inc. Office Expansion," prepared by Woodard and Curran and dated January 2006, with a latest revision date of February 27, 2006. The project site is located on the north side of Congress Street in the City of Portland.

The applicants submitted a Natural Resources Protection Act (N.R.P.A.) Permit-By-Rule notification form (PBR #39683) indicating that activities adjacent to a stream will be carried out in accordance with Chapter 305 of the N.R.P.A. Approximately 50 square feet of forested wetland will be filled to construct the proposed project. This amount of wetland to be altered is exempt from review under the N.R.P.A.

C. Current Use of Site: The project site, which is approximately 6.65 acres in size, currently contains an approximately 13,232 square-foot office building and associated parking.

2. BUFFER STRIPS:

The project site is bisected by a stream. Currently, portions of an existing parking lot are within 75 feet of the stream. A portion of the proposed access drive to the rear parking area will be located in essentially the same area. Grading for one of the proposed stormwater filter basins and other minor grading associated with the proposed rear parking area will be located within the stream buffer. To minimize additional impacts to the buffer, the applicants agreed to eliminate one row of parking that was located closest to the stream. The applicants also agreed to plant additional trees and shrubs at the base of the retaining wall adjacent to the proposed access drive to improve the remaining wooded stream buffer, which will be maintained as an undisturbed buffer. The planting specifications are included on the landscaping plan (sheet L-1.0 of the set of plans referenced in Finding 1), last revised February 27, 2006. Vegetation to be planted in the stream buffer includes red twig dogwood, burkwood viburnum, and highbush blueberry.

The Department finds that the applicants have made adequate provision for buffer strips.

3. SURFACE WATER QUALITY:

The proposed project includes 32,441 square feet of new impervious area and is located within the watershed of the Stroudwater River. Because of the project's location and size, stormwater runoff from the project site must be treated to meet the sliding scale total suspended solids (TSS) standard outlined the Department Rules, Chapter 500 (December 31, 1997). The applicants propose to remove approximately 55 percent of TSS from the project's stormwater runoff by utilizing underdrained filter basins and dry swales.

As discussed in Finding 4, the applicants' proposed stormwater management system was reviewed by, and revised in response to, comments from the Division of Watershed Management of the Bureau of Land and Water Quality (DWM). Specific aspects of the system, including measures to protect water quality, are further discussed in Finding 4.

Based on the stormwater management system's design and DWM's review, the Department finds that the applicants have made adequate provision to ensure that the proposed project will meet the stormwater quality standards contained in Department Rules, Chapter 500 and to ensure that the project will not have an unreasonable adverse impact on surface water quality.

4. STORMWATER MANAGEMENT:

The applicants are proposing to utilize a stormwater management system consisting of a subsurface detention structure, underdrained filter basins and dry swales. This system is based on estimates of pre- and post-development stormwater runoff flows obtained by using Hydrocad, a stormwater modeling software that utilizes the methodologies outlined in Technical Releases #55 and #20, U.S.D.A., Soil Conservation Service), and detains stormwater from 24-hour storms of 2-, 10-, and 25-year frequency. The post-development peak flow from the site will not exceed the pre-development peak flow from the site.

The stormwater management system proposed by the applicant was reviewed by, and revised in response to, comments from the DWM. In its comments, DWM stated that the proposed system complies with Department standards for stormwater management. The applicant must retain the services of the design engineer to inspect the installation of the underdrained filter basins and dry swales, and upon completion, submit to the Bureau of Land and Water Quality a written certification that the structures were installed in accordance with the approved design.

The applicant submitted a maintenance plan that includes provisions for regular maintenance of the proposed stormwater management structures. The responsible party for maintenance of the system will be ELC, Inc.

Based on the system's design and DWM's review, the Department finds that the applicants have made adequate provision to ensure that the proposed project will meet the stormwater quantity standards for: (1) peak flow from the site and peak flow of the receiving waters; (2) grading or other construction activity; (3) channel limits and runoff areas; (4) detention basins; (5) maintenance; (6) level spreaders; and (7) discharge to freshwater wetlands.

5. EROSION AND SEDIMENTATION CONTROL:

The applicants submitted an Erosion and Sedimentation Control Plan as Section 14 of the application. This plan and plan sheets containing erosion control details were reviewed by, and revised in response to the comments of DWM. Erosion control details will be included on the final construction plans and the erosion control narrative will be included in the project specifications to be provided to the construction contractor.

The Department finds that the applicants have made adequate provision to control erosion and sedimentation.

6. ALL OTHER:

All other Findings of Fact, Conclusions and Conditions remain as approved in Department Order #39-3190-05170, and subsequent orders.

BASED on the above findings of fact, and subject to the conditions listed below, the Department makes the following conclusions pursuant to 38 M.R.S.A. Sections 481 et seq.:

A. The applicants have provided adequate evidence of financial capacity and technical ability to develop the project in a manner consistent with state environmental standards.

B. The applicants have made adequate provision for fitting the development harmoniously into the existing natural environment and the development will not adversely affect existing uses, scenic character, air quality, water quality or other natural resources in the municipality or in neighboring municipalities.

C. The proposed development will be built on soil types which are suitable to the nature of the undertaking and will not cause unreasonable erosion of soil or sediment nor inhibit the natural transfer of soil.

D. The proposed development meets the standards for storm water management in Section 420-D and the standard for erosion and sedimentation control in Section 420-C provided the design engineer submits a certification as described in Finding 3.

E. The proposed development will not pose an unreasonable risk that a discharge to a significant groundwater aquifer will occur.

F. The applicants have made adequate provision of utilities, including water supplies, sewerage facilities, solid waste disposal and roadways required for the development and the development will not have an unreasonable adverse effect on the existing or proposed utilities and roadways in the municipality or area served by those services.

G. The activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties nor create an unreasonable flood hazard to any structure.

THEREFORE, the Department APPROVES the application of CADCAM ASSOCIATES/ELC, INC. to expand an existing office building and construct associated improvements as outlined in Finding 1, SUBJECT TO THE FOLLOWING CONDITIONS and all applicable standards and regulations:

1. The Standard Conditions of Approval, a copy attached.

2. In addition to any specific erosion control measures described in this or previous orders, the applicants shall take all necessary actions to ensure that their activities or those of their agents do not result in noticeable erosion of soils or fugitive dust emissions on the site during the construction and operation of the project covered by this approval.

3. Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

4. The applicant shall retain the services of the design engineer to inspect the installation of the underdrained filter basins and dry swales, and upon completion, submit to the Bureau of Land and Water Quality a written certification that the structures were installed in accordance with the approved design.

5. All other Findings of Fact, Conclusions and Conditions remain as approved in Department Order #39-3190-05170, and subsequent orders, and are incorporated herein.

THIS APPROVAL DOES NOT CONSTITUTE OR SUBSTITUTE FOR ANY OTHER REQUIRED STATE, FEDERAL OR LOCAL APPROVALS NOR DOES IT VERIFY COMPLIANCE WITH ANY APPLICABLE SHORELAND ZONING ORDINANCES.

DONE AND DATED AT AUGUSTA, MAINE, THIS 3RD DAY OF April, 2006.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

By: ______________________ For
DAVID P. LITTELL, COMMISSIONER

PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application January 23, 2006
Date of application acceptance January 30, 2006

Date filed with Board of Environmental Protection
MR/ATS#56953/L10223QB

FILED
APR 4 2006
BOARD OF ENVIRONMENTAL PROT.
STATE OF MAINE

SITE LOCATION OF DEVELOPMENT (SITE) STANDARD CONDITIONS

STRICT CONFORMANCE WITH THE STANDARD AND SPECIAL CONDITIONS OF THIS APPROVAL IS NECESSARY FOR THE PROJECT TO MEET THE STATUTORY CRITERIA FOR APPROVAL.

1. This approval is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. Any variation from the plans, proposals and supporting documents is subject to the review and approval of the Board prior to implementation. Further subdivision of proposed lots by the applicant or future owners is specifically prohibited, without prior approval by the Board of Environmental Protection, and the applicant shall include deed restrictions to this effect.

2. The applicant shall secure and comply with all applicable Federal, State and local licenses, permits, authorizations, conditions, agreements, and orders, prior to or during construction and operation as appropriate.

3. The applicant shall submit all reports and information requested by the Board or Department demonstrating that the applicant has complied or will comply with all conditions of this approval. All preconstruction terms and conditions must be met before construction begins.

4. Advertising relating to matters included in this application shall refer to this approval only if it notes that the approval has been granted WITH CONDITIONS, and indicates where copies of those conditions may be obtained.

5. Unless otherwise provided in this approval, the applicant shall not sell, lease, assign or otherwise transfer the development or any portion thereof without prior written approval of the Board where the purpose or consequence of the transfer is to transfer any of the obligations of the developer as incorporated in this approval. Such approval shall be granted only if the applicant or transferee demonstrates to the Board that the transferee has the technical capacity and financial ability to comply with conditions of this approval and the proposals and plans contained in the application and supporting documents submitted by the applicant.

6. If the construction or operation of the activity is not begun within two years, this approval shall lapse and the applicant shall reapply to the Board for a new approval. The applicant may not begin construction or operation of the development until a new approval is granted. Reapplications for approval shall state the reasons why the development was not begun within two years from the granting of the initial approval and the reasons why the applicant will be able to begin the activity within two years from the granting of a new approval, if granted. Reapplications for approval may include information submitted in the initial application by reference.

7. If the approved development is not completed within five years from the date of the granting of approval, the Board may reexamine its approval and impose additional terms or conditions or prescribe other necessary corrective action to respond to significant changes in circumstances which may have occurred during the five-year period.

8. A copy of this approval must be included in or attached to all contract bid specifications for the development.

9. Work done by a contractor pursuant to this approval shall not begin before the contractor has been shown by the developer a copy of this approval.

(2/81)/Revised November 1, 1979

DEPLW 148

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE HOUSE STATION 17 AUGUSTA, MAINE 04333

DEPARTMENT ORDER

IN THE MATTER OF

CADCAM ASSOCIATES/ELC, INC.	) SITE LOCATION OF DEVELOPMENT ACT
Portland, Cumberland County	)
OFFICE BUILDING EXPANSION	) MINOR AMENDMENT
L-10223-39-Q-B (approval)	) FINDINGS OF FACT AND ORDER

Pursuant to the provisions of 38 M.R.S.A. Sections 481 et seq., the Department of Environmental Protection has considered the application of CADCAM ASSOCIATES with the supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

1. PROJECT DESCRIPTION:

A. History of Project: In Department Order #39-3190-05170, dated July 30, 1979, the Department approved the development of an industrial park known as Stroudwater Estates, Phase I. Phase I consisted of eight lots on an approximately 130-acre parcel of land. Department Order #L-10223-86-A-N, dated June 14, 1984, approved the development of Phase II of Stroudwater Estates, which consisted of an additional twelve lots. In Department Order #L-10223-39-K-N, dated November 20, 1992, the Department approved Stroudwater Estates Phase III. The Phase III approval lapsed, and in Department Order #L-10223-39-O-M, dated April 2, 2002, the Department approved the addition of an 85-acre parcel to the subdivision as an unbuildable lot.

B. Summary: The applicants own Lots 15 and 16 of Stroudwater Estates Phase II, and propose to construct a three-story building addition with a footprint of approximately 7,560 square feet, an addition to a parking lot on the northerly portion of the site, new parking at the rear of the building, a new access drive, and a redesigned plaza and walkway in the center of the site. The proposed project is shown on a set of 14 plans, the first of which is entitled "CADCAM Associates – Portland, Maine – Woodard & Curran Inc. Office Expansion," prepared by Woodard and Curran and dated January 2006, with a latest revision date of February 27, 2006. The project site is located on the north side of Congress Street in the City of Portland.

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C. Current Use of Site: The project site, which is approximately 6.65 acres in size, currently contains an approximately 13,232 square-foot office building and associated parking.

2. BUFFER STRIPS:

The project site is bisected by a stream. Currently, portions of an existing parking lot are within 75 feet of the stream. A portion of the proposed access drive to the rear parking area will be located in essentially the same area. Grading for one of the proposed stormwater filter basins and other minor grading associated with the proposed rear parking area will be located within the stream buffer. To minimize additional impacts to the buffer, the applicants agreed to eliminate one row of parking that was located closest to the stream. The applicants also agreed to plant additional trees and shrubs at the base of the retaining wall adjacent to the proposed access drive to improve the remaining wooded stream buffer, which will be maintained as an undisturbed buffer. The planting specifications are included on the landscaping plan (sheet L-1.0 of the set of plans referenced in Finding 1), last revised February 27, 2006. Vegetation to be planted in the stream buffer includes red twig dogwood, burkwood viburnum, and highbush blueberry.

The Department finds that the applicants have made adequate provision for buffer strips.

3. SURFACE WATER QUALITY:

The proposed project includes 32,441 square feet of new impervious area and is located within the watershed of the Stroudwater River. Because of the project's location and size, stormwater runoff from the project site must be treated to meet the sliding scale total suspended solids (TSS) standard outlined the Department Rules, Chapter 500 (December 31, 1997). The applicants propose to remove approximately 55 percent of TSS from the project's stormwater runoff by utilizing underdrained filter basins and dry swales.

As discussed in Finding 4, the applicants' proposed stormwater management system was reviewed by, and revised in response to, comments from the Division of Watershed Management of the Bureau of Land and Water Quality (DWM). Specific aspects of the system, including measures to protect water quality, are further discussed in Finding 4.

Based on the stormwater management system's design and DWM's review, the Department finds that the applicants have made adequate provision to ensure that the proposed project will meet the stormwater quality standards contained in Department Rules, Chapter 500 and to ensure that the project will not have an unreasonable adverse impact on surface water quality.

4. STORMWATER MANAGEMENT:

The applicants are proposing to utilize a stormwater management system consisting of a subsurface detention structure, underdrained filter basins and dry swales. This system is based on estimates of pre- and post-development stormwater runoff flows obtained by using Hydrocad, a stormwater modeling software that utilizes the methodologies outlined in Technical Releases #55 and #20, U.S.D.A., Soil Conservation Service), and detains stormwater from 24-hour storms of 2-, 10-, and 25-year frequency. The post-development peak flow from the site will not exceed the pre-development peak flow from the site.

The stormwater management system proposed by the applicant was reviewed by, and revised in response to, comments from the DWM. In its comments, DWM stated that the proposed system complies with Department standards for stormwater management. The applicant must retain the services of the design engineer to inspect the installation of the underdrained filter basins and dry swales, and upon completion, submit to the Bureau of Land and Water Quality a written certification that the structures were installed in accordance with the approved design.

The applicant submitted a maintenance plan that includes provisions for regular maintenance of the proposed stormwater management structures. The responsible party for maintenance of the system will be ELC, Inc.

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The Department finds that the applicants have made adequate provision to control erosion and sedimentation.

6. ALL OTHER:

All other Findings of Fact, Conclusions and Conditions remain as approved in Department Order #39-3190-05170, and subsequent orders.

BASED on the above findings of fact, and subject to the conditions listed below, the Department makes the following conclusions pursuant to 38 M.R.S.A. Sections 481 et seq.:

A. The applicants have provided adequate evidence of financial capacity and technical ability to develop the project in a manner consistent with state environmental standards.

B. The applicants have made adequate provision for fitting the development harmoniously into the existing natural environment and the development will not adversely affect existing uses, scenic character, air quality, water quality or other natural resources in the municipality or in neighboring municipalities.

C. The proposed development will be built on soil types which are suitable to the nature of the undertaking and will not cause unreasonable erosion of soil or sediment nor inhibit the natural transfer of soil.

D. The proposed development meets the standards for storm water management in Section 420-D and the standard for erosion and sedimentation control in Section 420-C provided the design engineer submits a certification as described in Finding 3.

E. The proposed development will not pose an unreasonable risk that a discharge to a significant groundwater aquifer will occur.

F. The applicants have made adequate provision of utilities, including water supplies, sewerage facilities, solid waste disposal and roadways required for the development and the development will not have an unreasonable adverse effect on the existing or proposed utilities and roadways in the municipality or area served by those services.

G. The activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties nor create an unreasonable flood hazard to any structure.

THEREFORE, the Department APPROVES the application of CADCAM ASSOCIATES/ELC, INC. to expand an existing office building and construct associated improvements as outlined in Finding 1, SUBJECT TO THE FOLLOWING CONDITIONS and all applicable standards and regulations:

1. The Standard Conditions of Approval, a copy attached.

2. In addition to any specific erosion control measures described in this or previous orders, the applicants shall take all necessary actions to ensure that their activities or those of their agents do not result in noticeable erosion of soils or fugitive dust emissions on the site during the construction and operation of the project covered by this approval.

3. Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

4. The applicant shall retain the services of the design engineer to inspect the installation of the underdrained filter basins and dry swales, and upon completion, submit to the Bureau of Land and Water Quality a written certification that the structures were installed in accordance with the approved design.

5. All other Findings of Fact, Conclusions and Conditions remain as approved in Department Order #39-3190-05170, and subsequent orders, and are incorporated herein.

THIS APPROVAL DOES NOT CONSTITUTE OR SUBSTITUTE FOR ANY OTHER REQUIRED STATE, FEDERAL OR LOCAL APPROVALS NOR DOES IT VERIFY COMPLIANCE WITH ANY APPLICABLE SHORELAND ZONING ORDINANCES.

DONE AND DATED AT AUGUSTA, MAINE, THIS 3RD DAY OF APRIL, 2006.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

By: ________________ FOR
DAVID P. LITTELL, COMMISSIONER

PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application January 23, 2006
Date of application acceptance January 30, 2006

Date filed with Board of Environmental Protection
MR/ATS#56953/L10223QB

FILED
APR 4 2006
BOARD OF ENVIRONMENTAL PROT.
STATE OF MAINE

SITE LOCATION OF DEVELOPMENT (SITE) STANDARD CONDITIONS

STRICT CONFORMANCE WITH THE STANDARD AND SPECIAL CONDITIONS OF THIS APPROVAL IS NECESSARY FOR THE PROJECT TO MEET THE STATUTORY CRITERIA FOR APPROVAL.

1. This approval is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. Any variation from the plans, proposals and supporting documents is subject to the review and approval of the Board prior to implementation. Further subdivision of proposed lots by the applicant or future owners is specifically prohibited, without prior approval by the Board of Environmental Protection, and the applicant shall include deed restrictions to this effect.

2. The applicant shall secure and comply with all applicable Federal, State and local licenses, permits, authorizations, conditions, agreements, and orders, prior to or during construction and operation as appropriate.

3. The applicant shall submit all reports and information requested by the Board or Department demonstrating that the applicant has complied or will comply with all conditions of this approval. All preconstruction terms and conditions must be met before construction begins.

4. Advertising relating to matters included in this application shall refer to this approval only if it notes that the approval has been granted WITH CONDITIONS, and indicates where copies of those conditions may be obtained.

5. Unless otherwise provided in this approval, the applicant shall not sell, lease, assign or otherwise transfer the development or any portion thereof without prior written approval of the Board where the purpose or consequence of the transfer is to transfer any of the obligations of the developer as incorporated in this approval. Such approval shall be granted only if the applicant or transferee demonstrates to the Board that the transferee has the technical capacity and financial ability to comply with conditions of this approval and the proposals and plans contained in the application and supporting documents submitted by the applicant.

6. If the construction or operation of the activity is not begun within two years, this approval shall lapse and the applicant shall reapply to the Board for a new approval. The applicant may not begin construction or operation of the development until a new approval is granted. Reapplications for approval shall state the reasons why the development was not begun within two years from the granting of the initial approval and the reasons why the applicant will be able to begin the activity within two years from the granting of a new approval, if granted. Reapplications for approval may include information submitted in the initial application by reference.

7. If the approved development is not completed within five years from the date of the granting of approval, the Board may reexamine its approval and impose additional terms or conditions or prescribe other necessary corrective action to respond to significant changes in circumstances which may have occurred during the five-year period.

8. A copy of this approval must be included in or attached to all contract bid specifications for the development.

9. Work done by a contractor pursuant to this approval shall not begin before the contractor has been shown by the developer a copy of this approval.

(2/81)/Revised November 1, 1979

DEPLW 148

Finance Department
Duane G. Kline, Director

August 27, 2007

Bangor Savings Bank
280 Fore Street, Suite 200
Portland, ME 04101

Re: Performance Guarantee – Cianchette Family, LLC – 41 Hutchins Drive
Letter of Credit No. 176 dated May 15, 2006

This is to inform you that I am authorizing the reduction in the above-named letter of credit by the amount of $34,030.70, which leaves a balance of $32,709.30 remaining.

If you require any further information, please let me know.

Sincerely,

Duane G. Kline
Finance Director

DGK:mma

cc: Barbara Barhydt, Development Review Services Manager
Philip DiPierro, Development Review Coordinator

PORTLAND MAINE

Strengthening a Remarkable City, Building a Community for Life ® www.portlandmaine.gov

Planning and Development Department
Lee D. Urban, Director

Planning Division
Alexander Jaegerman, Director

TO: Duane Kline, Finance Department

FROM: Alexander Jaegerman, Planning Division Director

DATE: August 21, 2007

SUBJECT: Request for Reduction of Performance Guarantee to Defect Guarantee
Woodard & Curran Addition, 41 Hutchins Drive
(ID# 2005-0225) (Lead CBL#238A A 1; 239 A 4)
(Cianchette Family LLC)

Please reduce the letter of credit, #176 dated May 15, 2006 for the Woodard & Curran Building Addition, to the Defect Guarantee.

Original Amount	$327,093.00
First Reduction	$260,353.00
This Reduction	**$34,030.70**
Remaining Balance	$ 32,709.30

This is the second reduction for the project.

Approved: Alexander Jaegerman
Alexander Jaegerman
Planning Division Director

cc: Barbara Barhydt, Development Review Services Manager
Philip DiPierro, Development Review Coordinator
File: Urban Insight

O:\PLAN\DRC\Projects\Hutchins 41\PG Reduction to DG Letter.doc

TO: Inspections Department

FROM: Philip DiPierro, Development Review Coordinator

DATE: August 21, 2007

RE: Woodard & Curran Addition, 41 Hutchins Drive
(ID# 2005-0225) (Lead CBL#238A A 1; 239 A 4)
(Cianchette Family LLC)

After visiting the site, I have the following comments:

Site work complete

At this time, **I recommend issuing a permanent Certificate of Occupancy.**

Cc: Barbara Barhydt, Development Review Services Manager
Jeanie Bourke, Inspection Services Manager
File: Urban Insight

Philip DiPierro - RE: Woodard & Curran Addition Final Inspection

From: "John Brockington" <jsb@AlliedCook.com>
To: "Philip DiPierro " <PD@portlandmaine.gov>
Date: 8/6/2007 8:47 AM
Subject: RE: Woodard & Curran Addition Final Inspection

Phil - As of last Friday, we have completed the remaining work with exception of the island that Woodard & Curran wanted to change with staff approval. If you have time to stop at the site to check the work completed so we can close out our final payment with the owner would be greatly appreciated. Please let me know if everything is done to your acceptance. Thanks for all your help, John

-----Original Message-----
From: Philip DiPierro [mailto:PD@portlandmaine.gov]
Sent: Wednesday, July 11, 2007 1:59 PM
To: John Brockington
Subject: RE: Woodard & Curran Addition Final Inspection

Hi John, I just wanted to follow up on the inspection we did yesterday. After you left I noticed a couple other items that will need to be addresed in addition to what we already identified.
I noticed several plantings were dead or dying at the foot of the retaining wall next to the driveway that leads to the lower, or rear parking areas. They will need to be replaced. Also the parking area by the cardboard dumpster abutting the driveway isn't consructed as shown on the approved plan. It appears to be missing an island area, and the current striping layout has eliminated 1 parking spot.

Please contact me with any questions. Thanks.

Philip DiPierro
Development Review Coordinator
City of Portland Planning Division
389 Congress Street
Portland, Maine 04101

Phone 207 874-8632
Fax 207 756-8258

>>> "John Brockington" <jsb@AlliedCook.com> 7/6/2007 8:11:19 AM >>>
Phil - Tuesday morning at 7:00 AM works great! I will meet you at the main entrance doors to Woodard & Curran. Thanks, John

-----Original Message-----
From: Philip DiPierro [mailto:PD@portlandmaine.gov]
Sent: Thursday, July 05, 2007 5:22 PM
To: John Brockington
Subject: RE: Woodard & Curran Addition Final Inspection

Yes, how about Tuesday morning at 7:00.

Philip DiPierro
Development Review Coordinator
City of Portland Planning Division
389 Congress Street

Portland, Maine 04101

Phone 207 874-8632
Fax 207 756-8258

>>> "John Brockington" <jsb@AlliedCook.com> 7/5/2007 5:16:55 PM >>>
Phil - Are you available next week for the final inspection? - John

> -----Original Message-----
> From: John Brockington
> Sent: Friday, June 29, 2007 4:03 PM
> To: Phil DiPierro (E-mail)
> Subject: Woodard & Curran Addition Final Inspection
>
> Phil -
>
> Can we meet at the Woodard & Curran next week to do the final site inspection?
>
> Thanks,
>
> John Brockington
> Allied/Cook Construction
> P.O. Box 1396
> Portland, ME 04104
> Tel. (207) 772-2888
> Fax (207) 885-5135
> Cell (207) 615-6730
> jsb@alliedcook.com
>

Philip DiPierro - RE: Woodard & Curran Addition Final Inspection

From: Philip DiPierro
To: Brockington, John
Date: 7/11/2007 1:59 PM
Subject: RE: Woodard & Curran Addition Final Inspection

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Phone 207 874-8632
Fax 207 756-8258

>>> "John Brockington" <jsb@AlliedCook.com> 7/6/2007 8:11:19 AM >>>
Phil - Tuesday morning at 7:00 AM works great! I will meet you at the main entrance doors to Woodard & Curran. Thanks, John

-----Original Message-----
From: Philip DiPierro [mailto:PD@portlandmaine.gov]
Sent: Thursday, July 05, 2007 5:22 PM
To: John Brockington
Subject: RE: Woodard & Curran Addition Final Inspection

Yes, how about Tuesday morning at 7:00.

Philip DiPierro
Development Review Coordinator
City of Portland Planning Division
389 Congress Street
Portland, Maine 04101

Phone 207 874-8632
Fax 207 756-8258

>>> "John Brockington" <jsb@AlliedCook.com> 7/5/2007 5:16:55 PM >>>
Phil - Are you available next week for the final inspection? - John

> -----Original Message-----
> From: John Brockington
> Sent: Friday, June 29, 2007 4:03 PM

> To: Phil DiPierro (E-mail)
> Subject: Woodard & Curran Addition Final Inspection
>
> Phil -
>
> Can we meet at the Woodard & Curran next week to do the final site inspection?
>
> Thanks,
>
> John Brockington
> Allied/Cook Construction
> P.O. Box 1396
> Portland, ME 04104
> Tel. (207) 772-2888
> Fax (207) 885-5135
> Cell (207) 615-6730
> jsb@alliedcook.com
>

In addition, this memorandum updates on further discussions between City Departments and Reviewers and the applicant which resolved other issues raised in the Planning Board Report #10-06. In summary these are:

a. Support for the waiver of the city standards to allow the internal access road to be 20 feet wide;
b. The request for an additional hydrant has been withdrawn;
c. Easements.

SITE PLAN REVIEW – Update to Planning Board Report #10-06

<u>Traffic</u>

Access

Can we wait

The review of access found that the main access road, where it meets Hutchins Drive, did not meet the City standards of 24 feet wide for two-way traffic. The revised proposals (<u>Attachment IV I e)</u> shows this to be widened to 24 feet wide.

The Report outlined the applicants request for a waiver from the 24 foot standard to allow the internal access road (running alongside the proposed building) to be 20 feet wide. The waiver was supported by the City Engineer (<u>Attachment IV C</u>) and Traffic Reviewer (see previous Report), but the Development Review Engineer Jim Seymour originally raised concerns over whether this width is workable in this situation; he now supports the waiver provided specific maintenance plans for winter conditions and snow removal are in place (<u>Attachment IV D</u>).

Traffic Generation

The Report outlined the issue of whether the traffic generation created by the additional employees that could occupy the new building would be within the capacity of the existing signaled junction where Hutchins Drive meets Congress Street. Tom Errico, the City's Traffic Engineering Reviewer, requested in January that the applicant conduct a post-development evaluation of the intersection and if that analysis identified a problem, some contribution towards correcting the problem would be required.

Gorrill Palmer, on behalf of the applicant, submitted an analysis of the post-development operation of this intersection on 2.21.2006 to Tom Errico for review (<u>Attachment IV A- f).</u> Tom Errico did not review that submission as Planning staff had queried the figure used (64) for maximum additional employees occupying the proposed building on the site. At present there are 111 employees in the existing complex on the site and the potential employee level once the new addition is fully occupied is 207. This would suggest that the traffic/intersection capacity assessment should be based on 207 less 111 (96 employees). Gorrill-Palmer used the figure of 64 additional employees as the basis of their assessment because the 32 W&C employees now working in leased premises off-site next door were subtracted because they were already using

Subcatchment 12X: North/West of Satellite

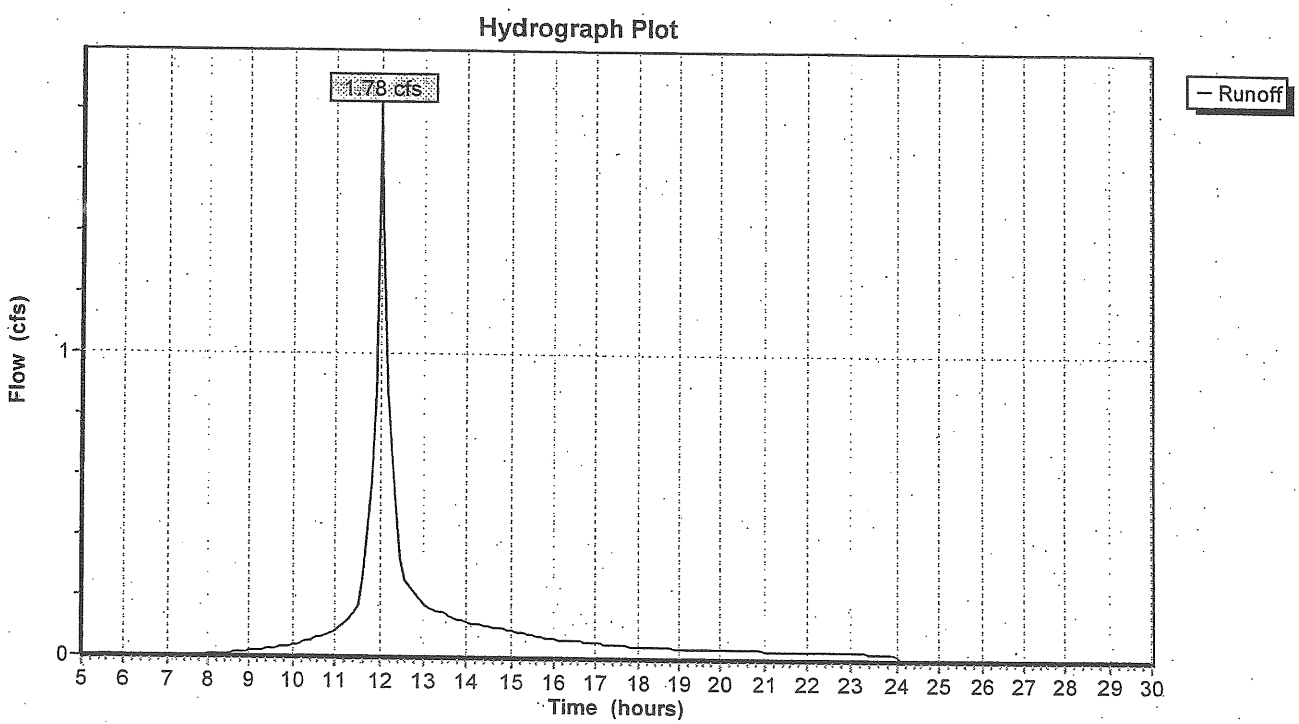
Runoff = 1.78 cfs @ 12.02 hrs, Volume= 0.134 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.020	73	WOODS (FAIR)-HSG "C"
0.400	74	OPEN SPACE (GOOD)-HSG "C"
0.170	98	IMPERVIOUS
0.590	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	16	0.1900	0.2		**Sheet Flow, Segment ID:AB** Grass: Dense n= 0.240 P2= 3.00"
0.8	13	0.5000	0.3		**Sheet Flow, Segment ID:BC** Grass: Dense n= 0.240 P2= 3.00"
1.3	185	0.0270	2.5		**Shallow Concentrated Flow, Segment ID:CD** Grassed Waterway Kv= 15.0 fps
0.2	60	0.0100	5.7	7.00	**Circular Channel (pipe), SEGMENT ID:DE** Diam= 15.0" Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
1.1	165	0.0300	2.6		**Shallow Concentrated Flow, SEGMENT ID:EF** Grassed Waterway Kv= 15.0 fps
4.8	439	Total			

Subcatchment 12X: North/West of Satellite



Subcatchment 13X: Existing NORTH-CENTRAL

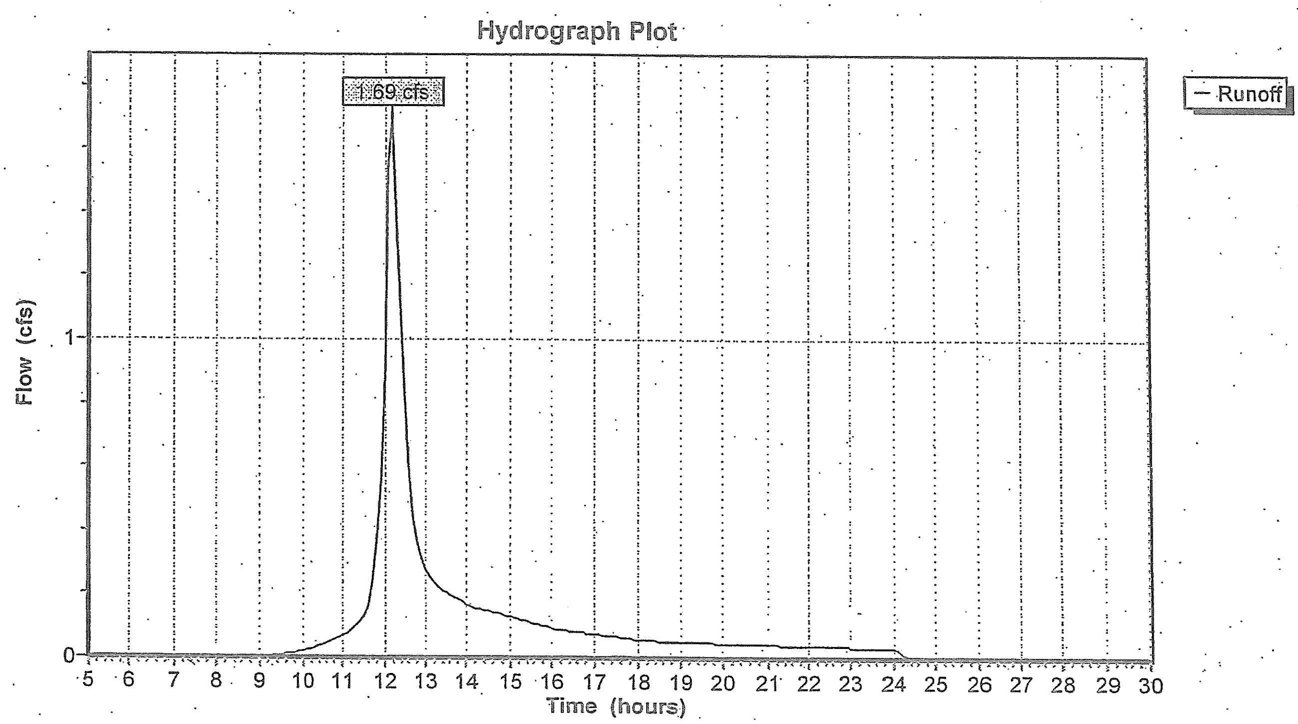
Runoff = 1.69 cfs @ 12.18 hrs, Volume= 0.167 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.000	98	IMPERVIOUS (PAVEMENT)
0.540	73	WOODS (FAIR)-HSG "C"
0.130	74	OPEN SPACE (GOOD)-HSG "C"
0.240	79	WOODS (FAIR)-HSG "D"
0.910	75	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	35	0.0700	0.1		**Sheet Flow, Segment ID:AB** Woods: Light underbrush n= 0.400 P2= 3.00"
6.7	65	0.1700	0.2		**Sheet Flow, Segment ID:BC** Woods: Light underbrush n= 0.400 P2= 3.00"
1.2	130	0.1300	1.8		**Shallow Concentrated Flow, SegmentC-D** Woodland Kv= 5.0 fps
1.7	100	0.0400	1.0		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
15.4	330	Total			

Subcatchment 13X: Existing NORTH-CENTRAL



Subcatchment 13X: Existing NORTH-CENTRAL

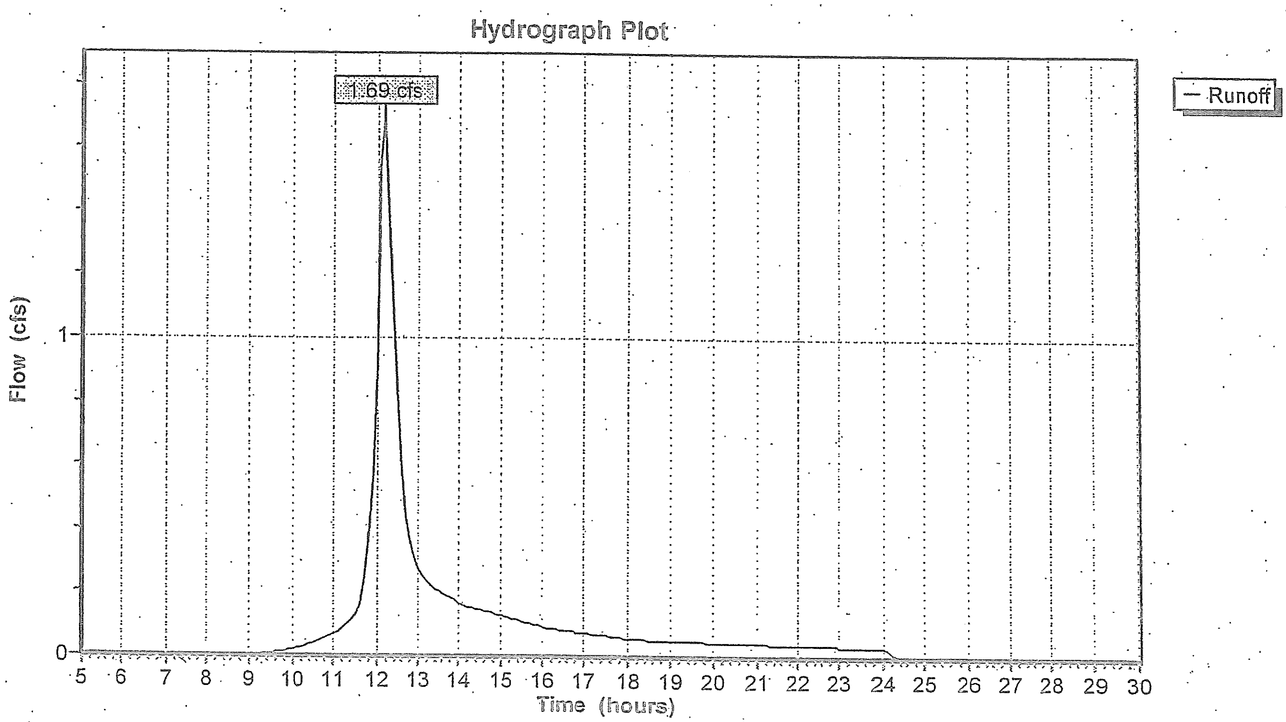
Runoff = 1.69 cfs @ 12.18 hrs, Volume= 0.167 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.000	98	IMPERVIOUS (PAVEMENT)
0.540	73	WOODS (FAIR)-HSG "C"
0.130	74	OPEN SPACE (GOOD)-HSG "C"
0.240	79	WOODS (FAIR)-HSG "D"
0.910	75	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	35	0.0700	0.1		**Sheet Flow, Segment ID:AB** Woods: Light underbrush n= 0.400 P2= 3.00"
6.7	65	0.1700	0.2		**Sheet Flow, Segment ID:BC** Woods: Light underbrush n= 0.400 P2= 3.00"
1.2	130	0.1300	1.8		**Shallow Concentrated Flow, SegmentC-D** Woodland Kv= 5.0 fps
1.7	100	0.0400	1.0		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
15.4	330	Total			

Subcatchment 13X: Existing NORTH-CENTRAL



Subcatchment 14X: Existing Northeast

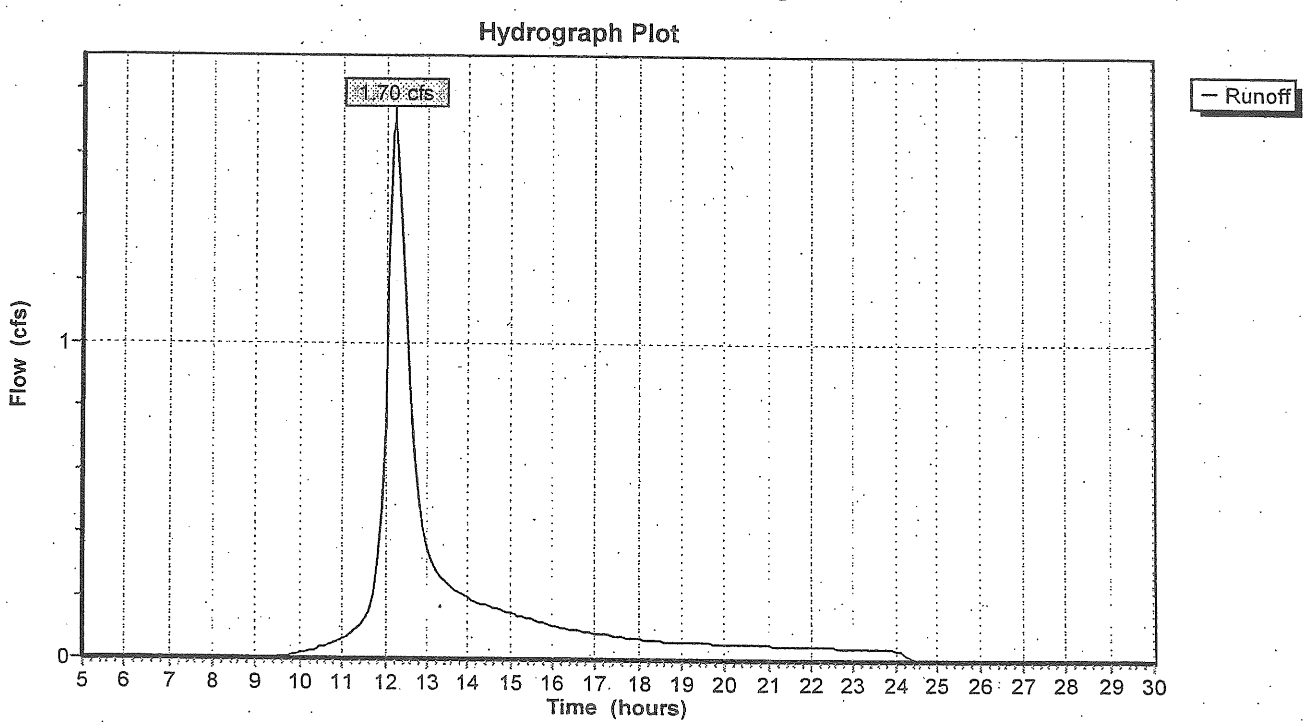
Runoff = 1.70 cfs @ 12.25 hrs, Volume= 0.184 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.810	73	Woods, Fair, HSG C
0.230	79	Woods, Fair, HSG D
1.040	74	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	60	0.0250	0.1		**Sheet Flow, Segment AB** Woods: Light underbrush n= 0.400 P2= 3.00"
4.0	40	0.2250	0.2		**Sheet Flow, SegmentBC** Woods: Light underbrush n= 0.400 P2= 3.00"
0.8	90	0.1444	1.9		**Shallow Concentrated Flow, SegmentCD** Woodland Kv= 5.0 fps
0.1	25	0.4400	3.3		**Shallow Concentrated Flow, SegmentDE** Woodland Kv= 5.0 fps
2.0	70	0.0140	0.6		**Shallow Concentrated Flow, SegmentEF** Woodland Kv= 5.0 fps
20.4	285	Total			

Subcatchment 14X: Existing Northeast



Subcatchment 21X: Existing Central

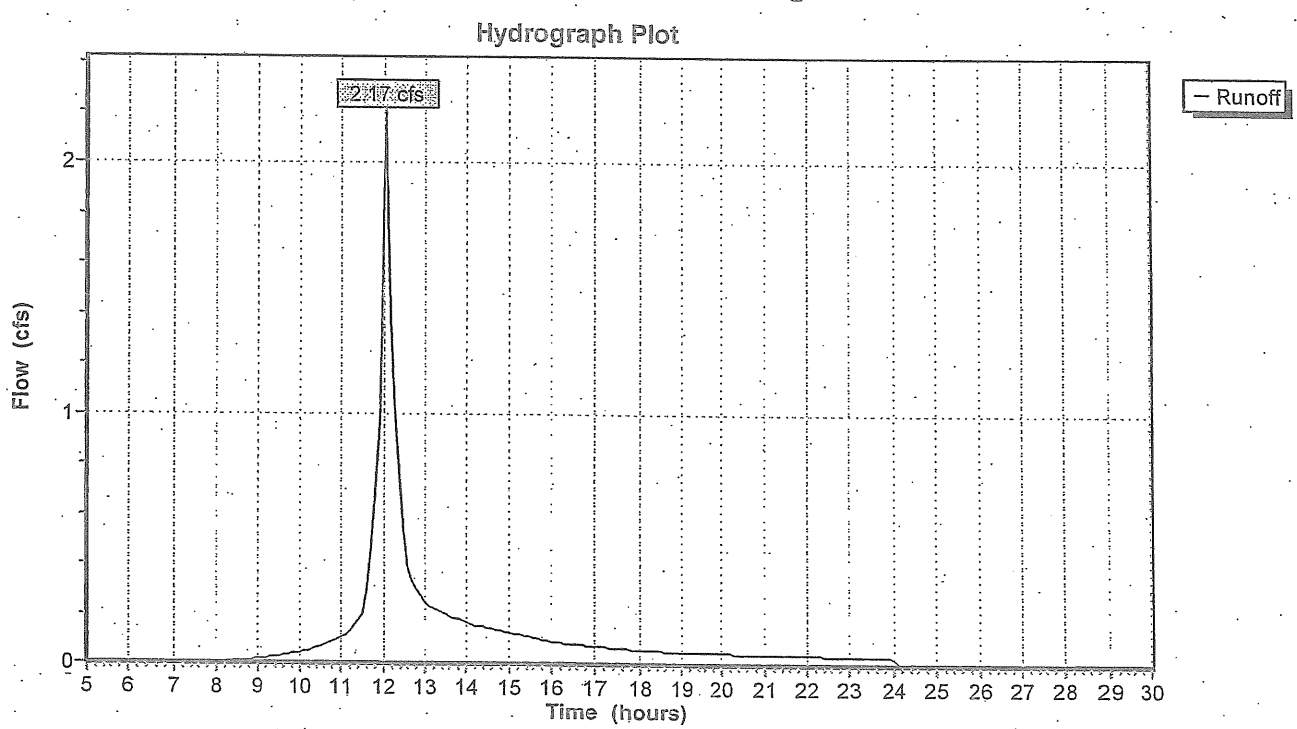
Runoff = 2.17 cfs @ 12.07 hrs, Volume= 0.180 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.260	73	WOODS (FAIR)-HSG "C"
0.250	74	OPEN SPACE (GOODG "C"
0.200	79	WOODS (FAIR)-HSD "D"
0.140	98	IMPERVIOUS (BLDG, PAVEMENT)
0.850	79	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	75	0.0600	0.2		**Sheet Flow, Segment ID:AB** Grass: Short n= 0.150 P2= 3.00"
0.7	15	0.4000	0.4		**Sheet Flow, SegmentBC** Grass: Short n= 0.150 P2= 3.00"
0.2	30	0.2700	2.6		**Shallow Concentrated Flow, Segment ID:CD** Woodland Kv= 5.0 fps
1.2	80	0.0500	1.1		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
7.3	200	Total			

Subcatchment 21X: Existing Central



Subcatchment 21X: Existing Central

Runoff = 2.17 cfs @ 12.07 hrs, Volume= 0.180 af

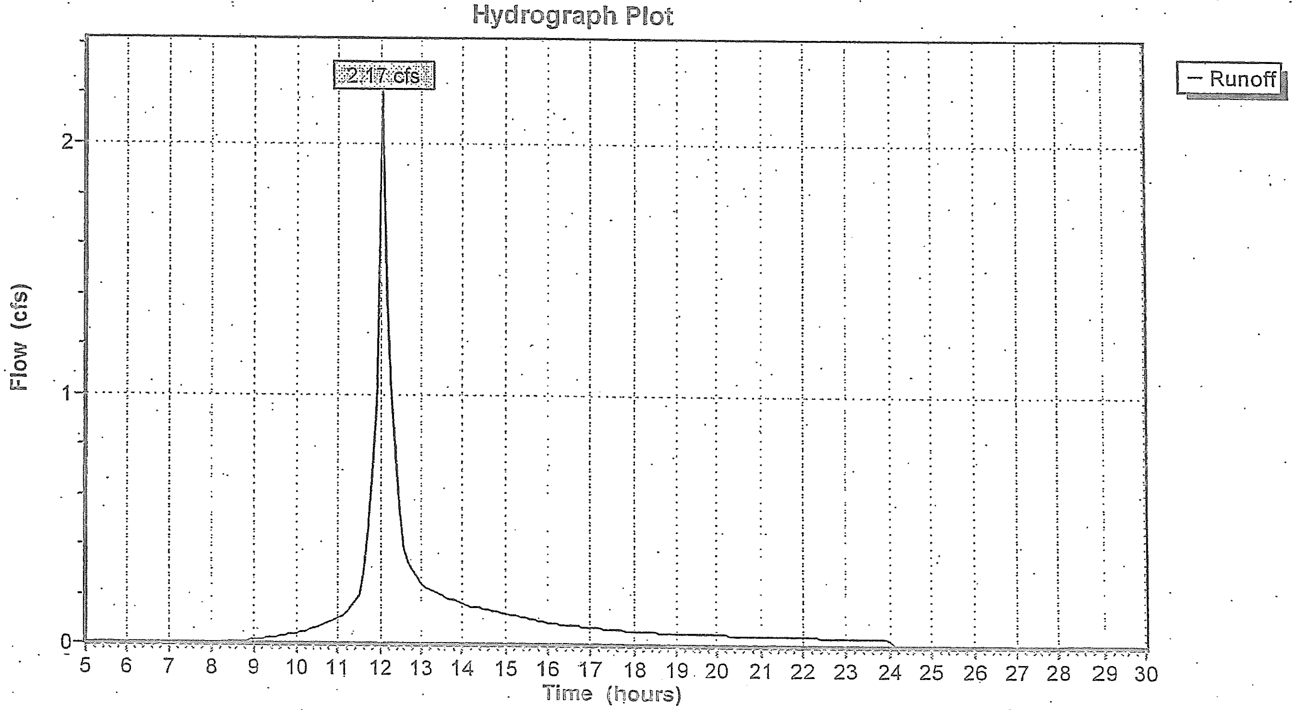
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.260	73	WOODS (FAIR)-HSG "C"
0.250	74	OPEN SPACE (GOODG "C"
0.200	79	WOODS (FAIR)-HSD "D"
0.140	98	IMPERVIOUS (BLDG, PAVEMENT)
0.850	79	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	75	0.0600	0.2		**Sheet Flow, Segment ID:AB** Grass: Short n= 0.150 P2= 3.00"
0.7	15	0.4000	0.4		**Sheet Flow, SegmentBC** Grass: Short n= 0.150 P2= 3.00"
0.2	30	0.2700	2.6		**Shallow Concentrated Flow, Segment ID:CD** Woodland Kv= 5.0 fps
1.2	80	0.0500	1.1		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
7.3	200	Total			

Subcatchment 21X: Existing Central

Hydrograph Plot



Subcatchment 22X: Existing Parking and Entrance Circle

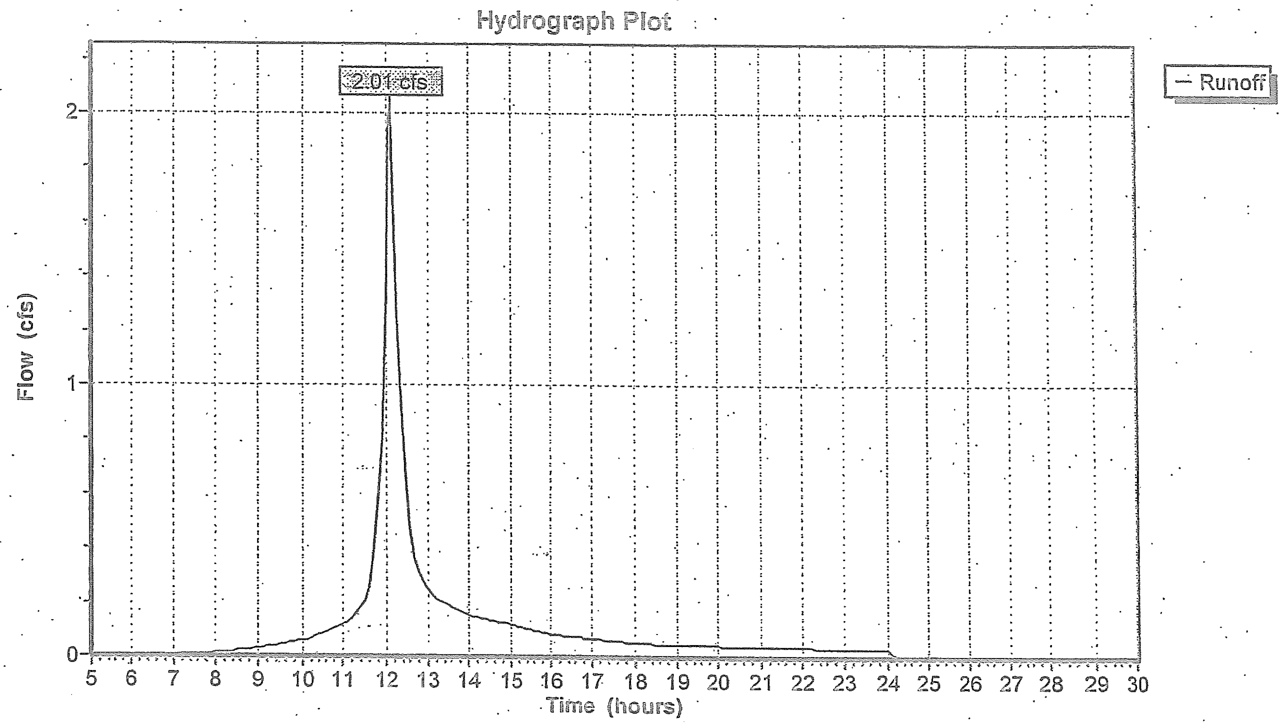
Runoff = 2.01 cfs @ 12.12 hrs, Volume= 0.180 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

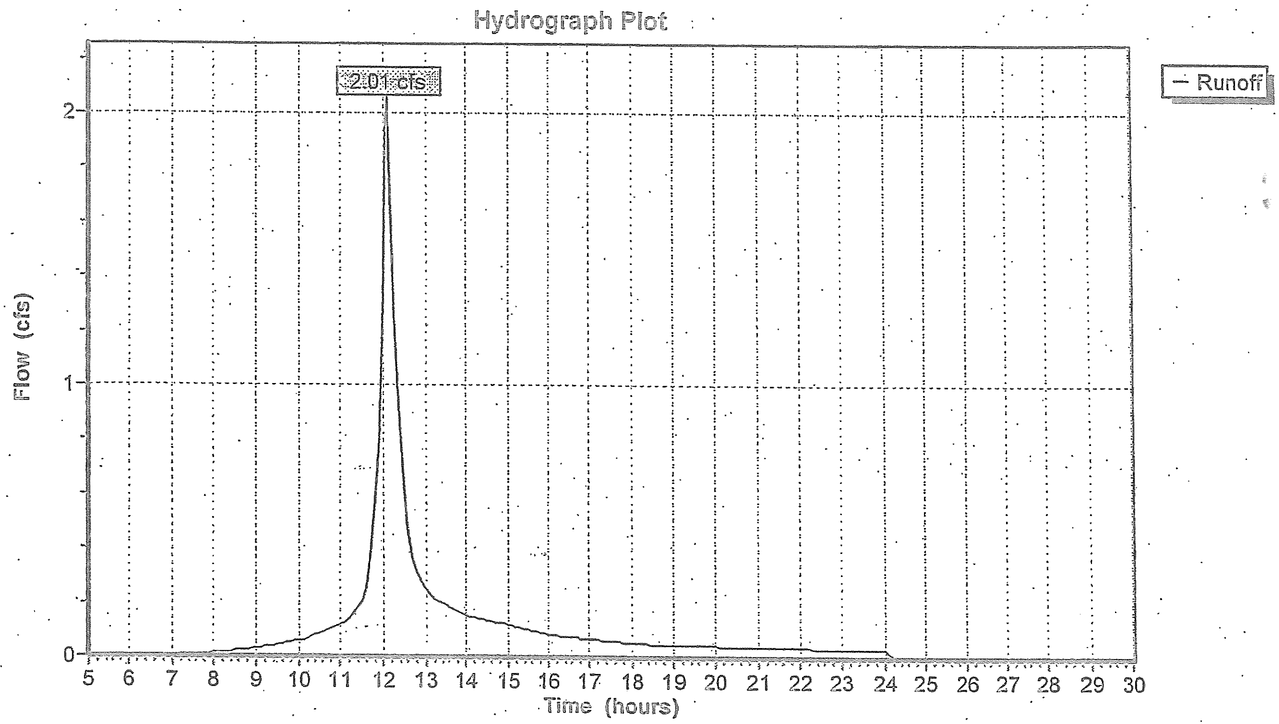
Area (ac)	CN	Description
0.130	73	WOODS (FAIR)-HSG "C"
0.280	74	OPEN SPACE (GOODG "C"
0.310	98	IMPERVIOUS (BLDG, PAVEMENT)
0.720	84	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0167	0.1		**Sheet Flow, Segment ID:AB** Grass: Short n= 0.150 P2= 3.00"
0.4	20	0.0125	0.8		**Sheet Flow, SegmentBC** Smooth surfaces n= 0.011 P2= 3.00"
7.9	65	0.1100	0.1		**Sheet Flow, SegmentCD** Woods: Light underbrush n= 0.400 P2= 3.00"
0.8	70	0.0860	1.5		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
0.4	90	0.0333	3.7		**Shallow Concentrated Flow, Segment ID:EF** Paved Kv= 20.3 fps
0.1	65	0.0500	12.0	9.42	**Circular Channel (pipe), SegmentFG** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011
12.0	325	Total			

Subcatchment 22X: Existing Parking and Entrance Circle



Subcatchment 22X: Existing Parking and Entrance Circle



Subcatchment 23X: Existing Buildings and surrounding

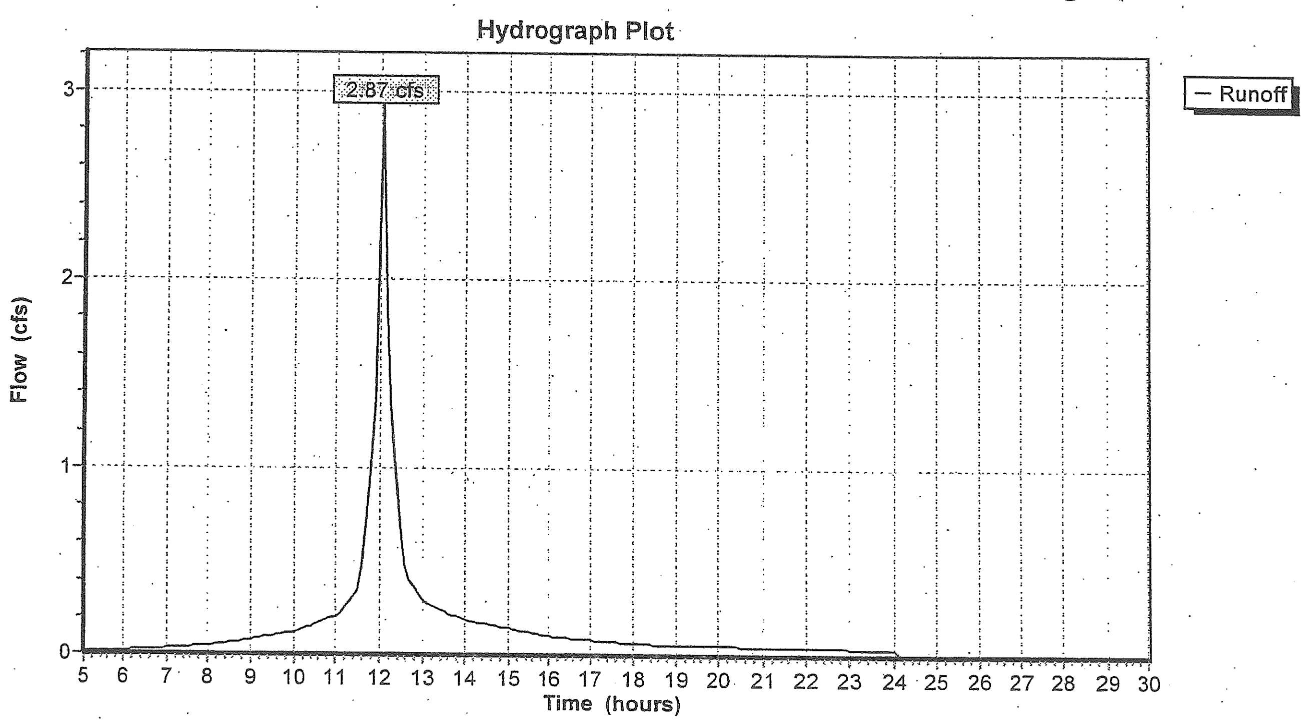
Runoff = 2.87 cfs @ 12.08 hrs, Volume= 0.249 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.310	79	OPEN SPACE (FAIR)-HSG "C"
0.200	98	Paved parking & roofs
0.300	98	Paved parking & roofs
0.810	91	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	10	0.2000	0.3		**Sheet Flow, Segment ID:AB** Grass: Short n= 0.150 P2= 3.00"
6.4	90	0.0500	0.2		**Sheet Flow, Segment ID:BC** Grass: Short n= 0.150 P2= 3.00"
0.4	60	0.1100	2.3		**Shallow Concentrated Flow, Segment ID:CD** Short Grass Pasture Kv= 7.0 fps
0.0	10	0.3000	3.8		**Shallow Concentrated Flow, Segment ID:DE** Short Grass Pasture Kv= 7.0 fps
0.9	95	0.0630	1.8		**Shallow Concentrated Flow, SegmentEF** Short Grass Pasture Kv= 7.0 fps
8.3	265	Total			

Subcatchment 23X: Existing Buildings and surrounding



Subcatchment 24X: Behind Existing Pond

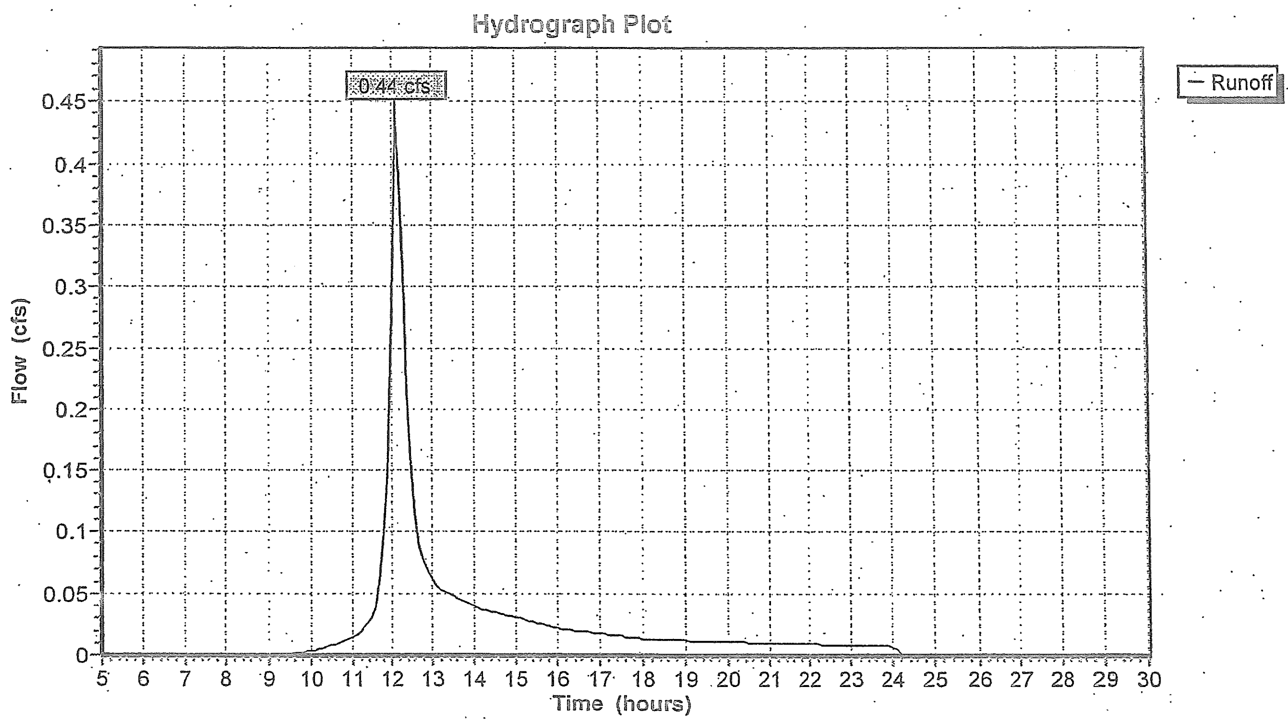
Runoff = 0.44 cfs @ 12.12 hrs, Volume= 0.039 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.230	73	Woods, Fair, HSG C

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	45	0.1111	0.1		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.00"
4.2	55	0.0545	0.2		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
1.5	125	0.0800	1.4		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
11.6	225	Total			

Subcatchment 24X: Behind Existing Pond



Subcatchment 24X: Behind Existing Pond

Runoff = 0.44 cfs @ 12.12 hrs, Volume= 0.039 af

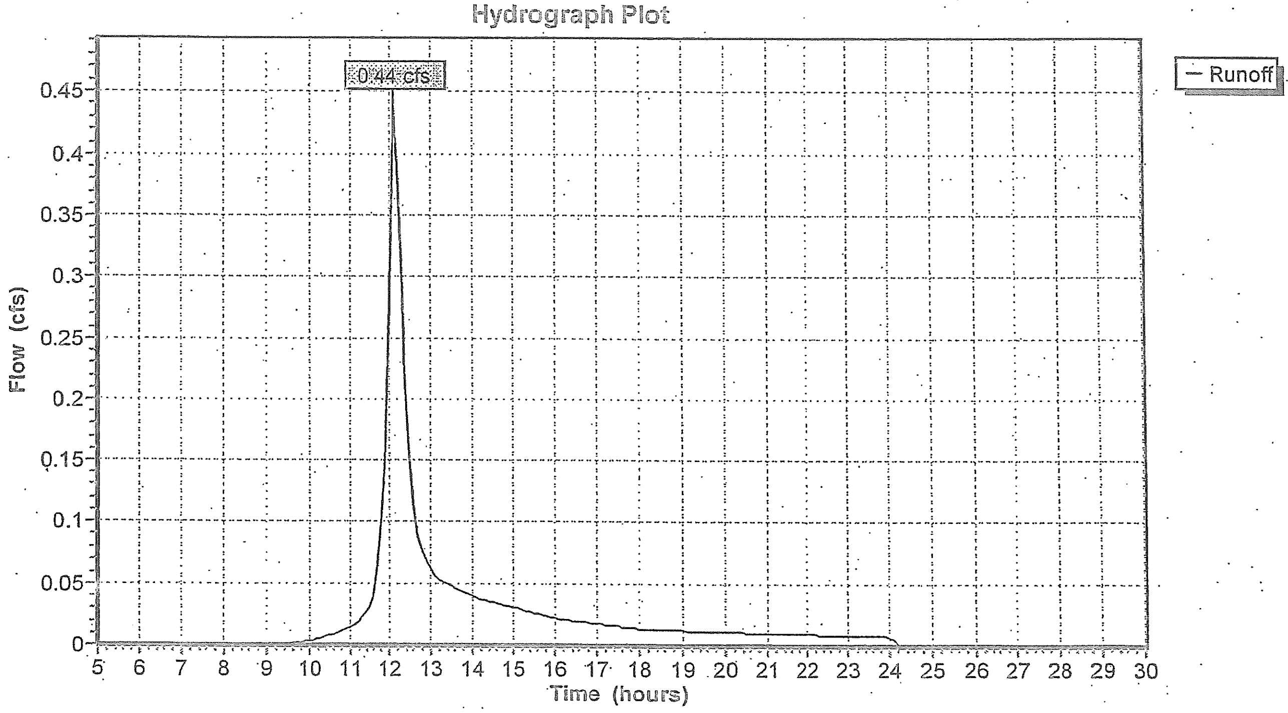
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.230	73	Woods, Fair, HSG C

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	45	0.1111	0.1		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.00"
4.2	55	0.0545	0.2		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
1.5	125	0.0800	1.4		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
11.6	225	Total			

Subcatchment 24X: Behind Existing Pond

Hydrograph Plot



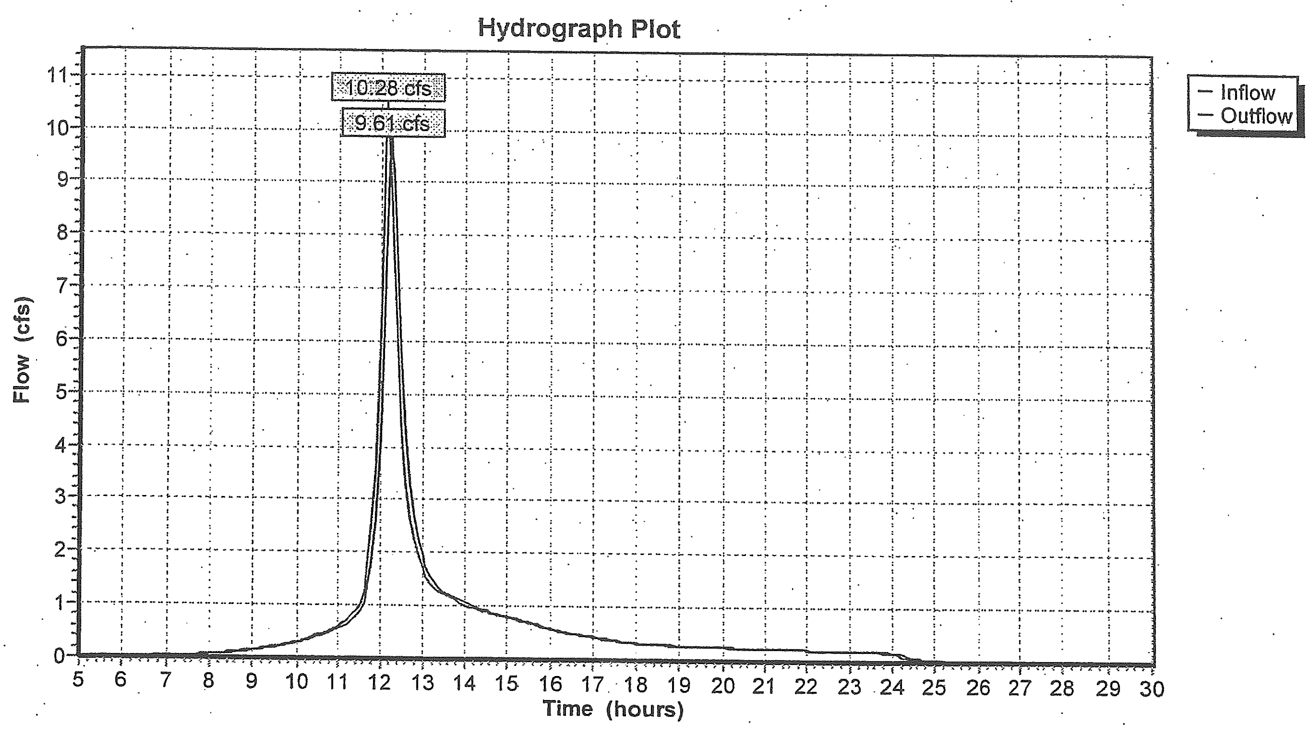
Reach 1R: Existing Swale

Inflow	=	10.28 cfs @	12.14 hrs,	Volume=	1.058 af
Outflow	=	9.61 cfs @	12.24 hrs,	Volume=	1.058 af, Atten= 7%, Lag= 5.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.2 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.3 fps, Avg. Travel Time= 10.6 min

Peak Depth= 0.91'
Capacity at bank full= 43.53 cfs
Inlet Invert= 30.00', Outlet Invert= 29.50'
7.00' x 2.00' deep channel, n= 0.050 Length= 200.0' Slope= 0.0025 '/'
Side Slope Z-value= 3.0 2.0 '/'

Reach 1R: Existing Swale



Reach 2R: Existing Swale

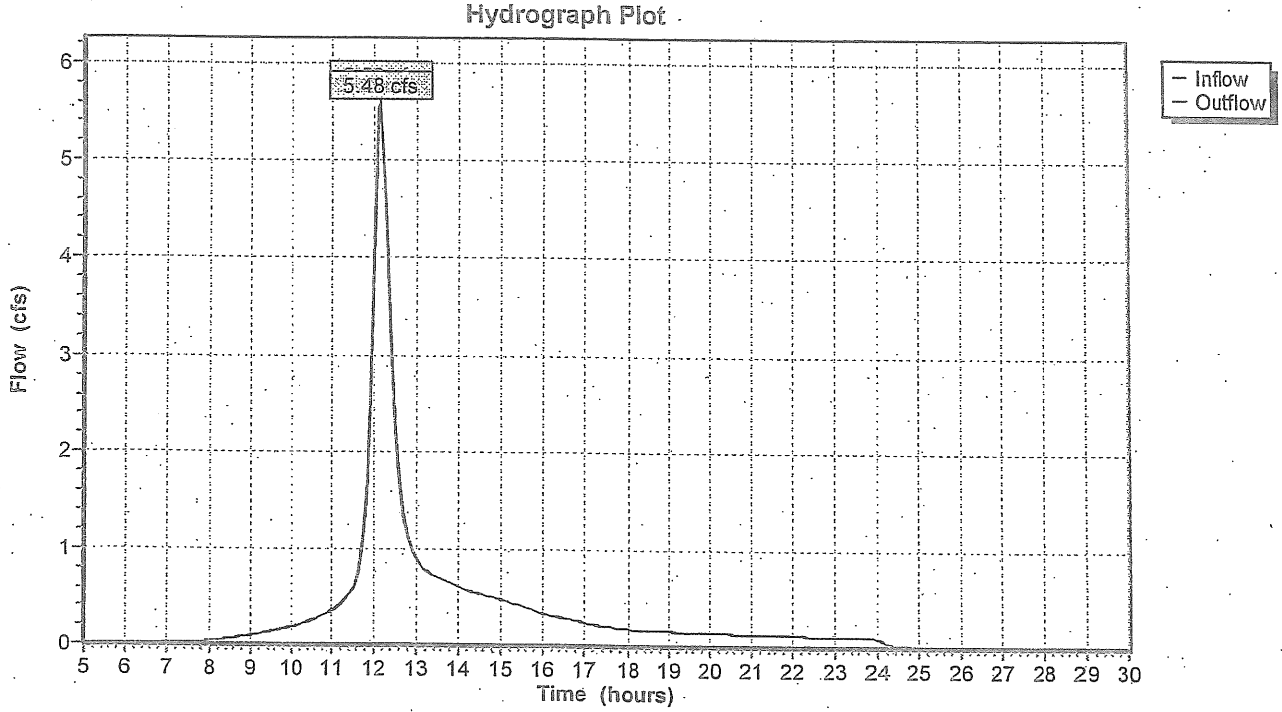
Inflow	=	5.59 cfs @	12.12 hrs,	Volume=	0.602 af
Outflow	=	5.48 cfs @	12.14 hrs,	Volume=	0.602 af, Atten= 2%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.7 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 0.5 fps, Avg. Travel Time= 2.6 min

Peak Depth= 0.54'
Capacity at bank full= 144.69 cfs
Inlet Invert= 30.80', Outlet Invert= 30.00'
5.00' x 3.00' deep channel, n= 0.050 Length= 80.0' Slope= 0.0100 '/'
Side Slope Z-value= 2.0 '/'

Reach 2R: Existing Swale

Hydrograph Plot



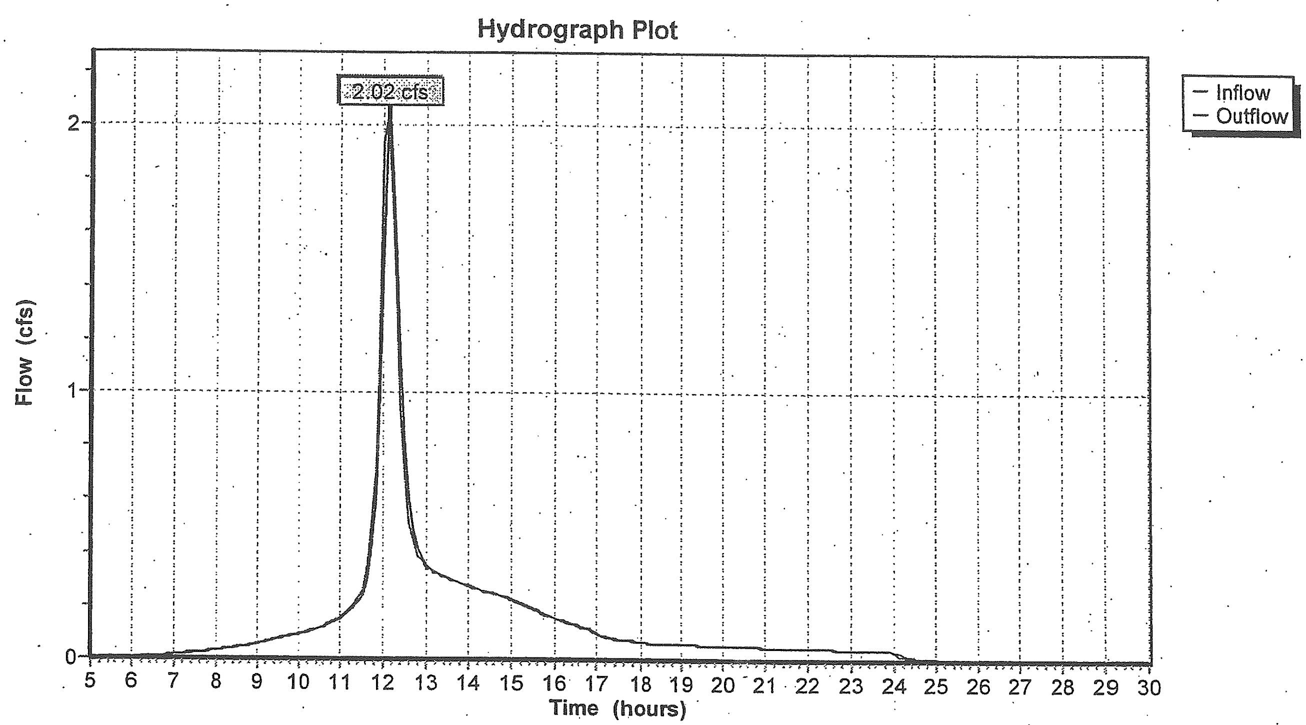
Reach 3R: Existing Swale

Inflow	=	2.03 cfs @ 12.07 hrs,	Volume=	0.242 af
Outflow	=	2.02 cfs @ 12.13 hrs,	Volume=	0.242 af, Atten= 0%, Lag= 3.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.2 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 0.4 fps, Avg. Travel Time= 5.4 min

Peak Depth= 0.30'
Capacity at bank full= 63.42 cfs
Inlet Invert= 32.00', Outlet Invert= 30.80'
5.00' x 2.00' deep channel, n= 0.050 Length= 120.0' Slope= 0.0100 '/'
Side Slope Z-value= 2.0 '/'

Reach 3R: Existing Swale



Reach R11: From P11 to Swale

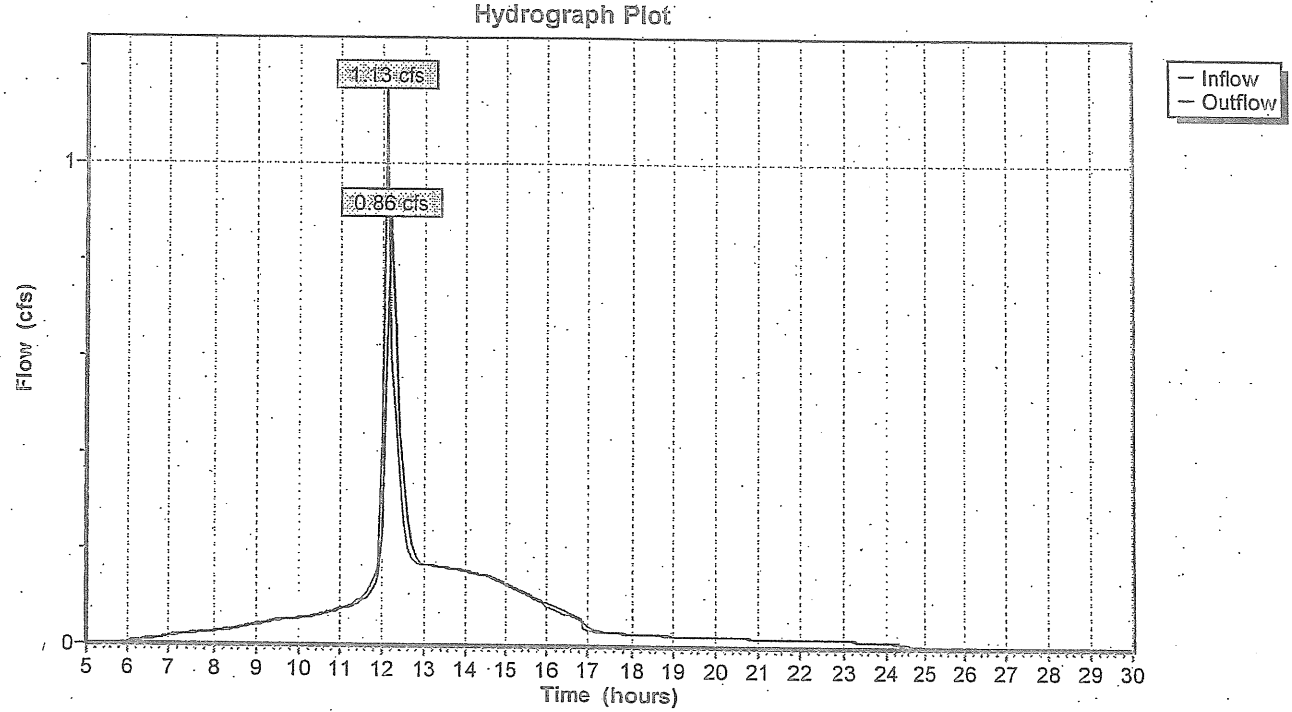
Inflow = 1.13 cfs @ 12.11 hrs, Volume= 0.108 af
Outflow = 0.86 cfs @ 12.21 hrs, Volume= 0.108 af, Atten= 23%, Lag= 6.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.4 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 9.4 min

Peak Depth= 0.14'
Capacity at bank full= 33.01 cfs
Inlet Invert= 45.90', Outlet Invert= 32.00'
15.00' x 1.00' deep channel, n= 0.400 Length= 70.0' Slope= 0.1986 '/'
Side Slope Z-value= 10.0 '/'

Reach R11: From P11 to Swale

Hydrograph Plot



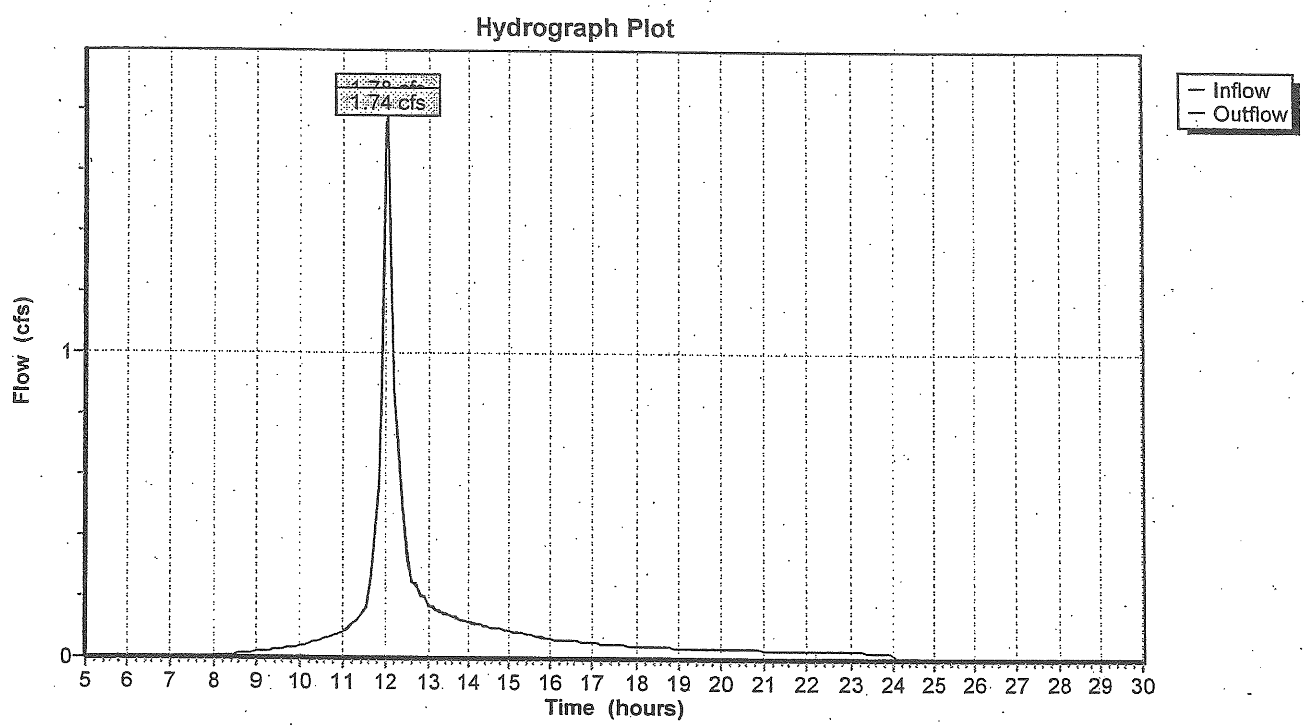
Reach R12: 48" RCP

Inflow = 1.78 cfs @ 12.02 hrs, Volume= 0.134 af
Outflow = 1.74 cfs @ 12.02 hrs, Volume= 0.134 af, Atten= 2%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 8.8 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.7 fps, Avg. Travel Time= 0.4 min

Peak Depth= 0.18'
Capacity at bank full= 463.95 cfs
Inlet Invert= 40.00', Outlet Invert= 32.00'
48.0" Diameter Pipe n= 0.012 Length= 90.0' Slope= 0.0889 '/'

Reach R12: 48" RCP



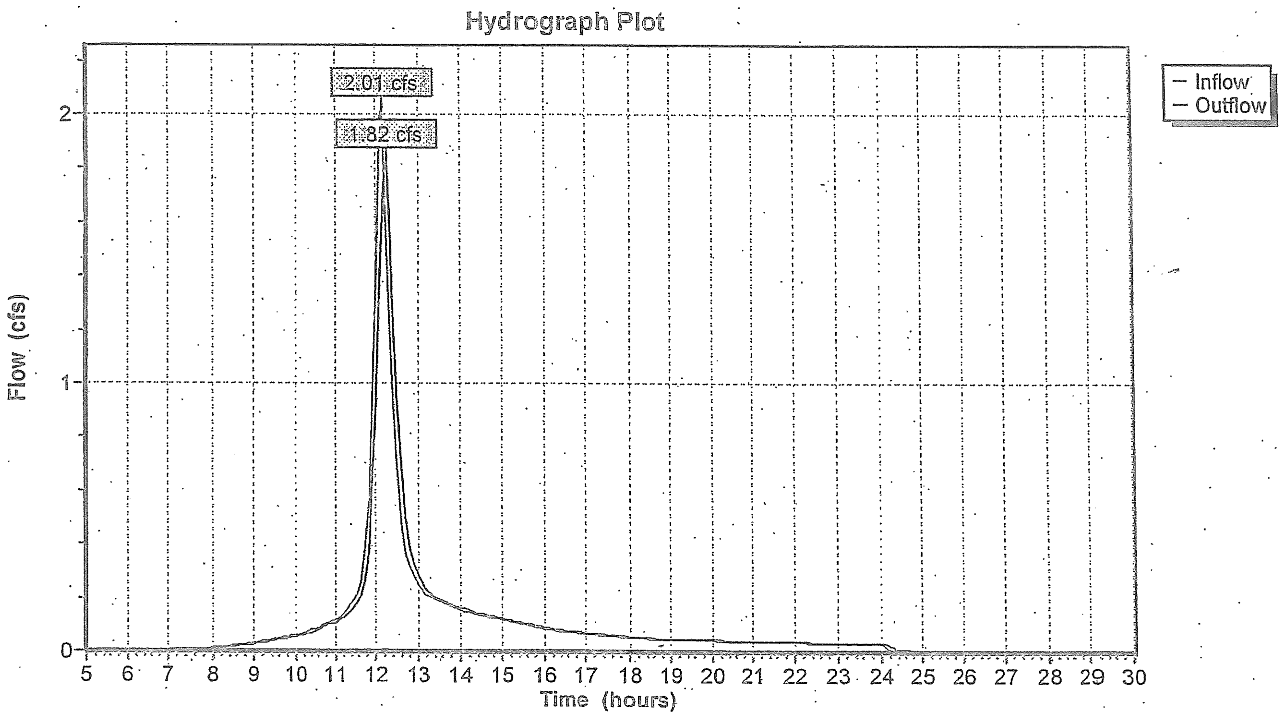
Reach R22: From 22 to Swale

Inflow = 2.01 cfs @ 12.12 hrs, Volume= 0.180 af
Outflow = 1.82 cfs @ 12.22 hrs, Volume= 0.180 af, Atten= 9%, Lag= 6.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.5 fps, Min. Travel Time= 3.0 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 11.0 min

Peak Depth= 0.23'
Capacity at bank full= 27.37 cfs
Inlet Invert= 44.00', Outlet Invert= 30.50'
15.00' x 1.00' deep channel, n= 0.400 Length= 90.0' Slope= 0.1500 '/'
Side Slope Z-value= 15.0 2.0 '/'

Reach R22: From 22 to Swale



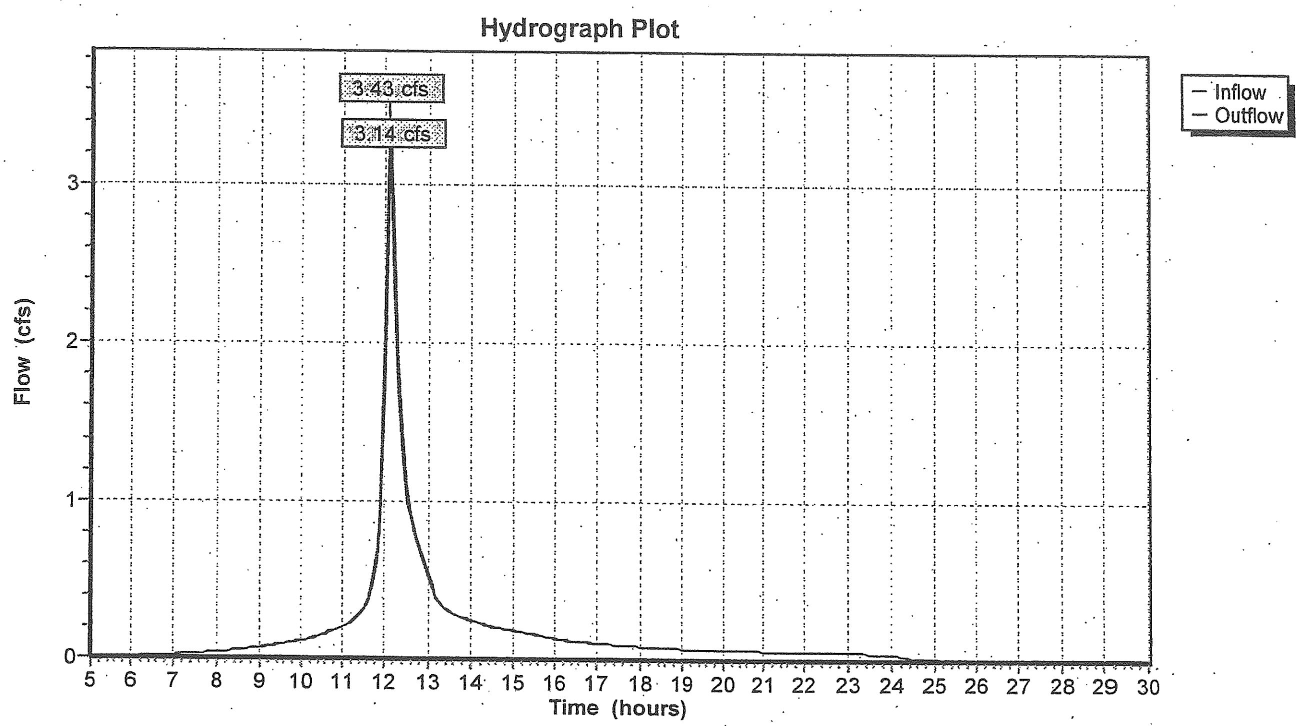
Reach R23: From Pond23 to Swale

Inflow	=	3.43 cfs @	12.11 hrs,	Volume=	0.288 af
Outflow	=	3.14 cfs @	12.14 hrs,	Volume=	0.288 af, Atten= 8%, Lag= 1.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.7 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 0.2 fps, Avg. Travel Time= 3.4 min

Peak Depth= 0.44'
Capacity at bank full= 21.38 cfs
Inlet Invert= 37.00', Outlet Invert= 30.00'
5.00' x 1.00' deep channel, n= 0.400 Length= 40.0' Slope= 0.1750 '/'
Side Slope Z-value= 15.0 '/'

Reach R23: From Pond23 to Swale



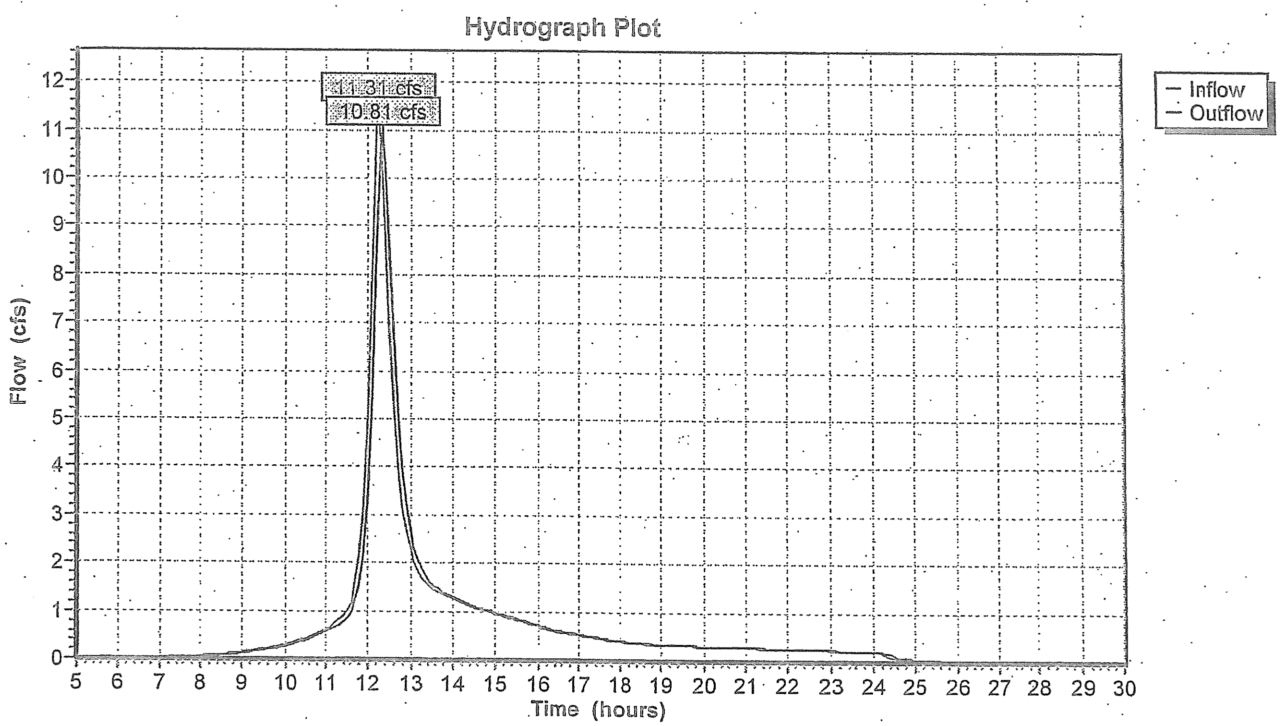
Reach SP: Study Point

Inflow = 11.31 cfs @ 12.24 hrs, Volume= 1.242 af
Outflow = 10.81 cfs @ 12.33 hrs, Volume= 1.242 af, Atten= 4%, Lag= 5.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.6 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.2 fps, Avg. Travel Time= 10.8 min

Peak Depth= 0.52'
Capacity at bank full= 239.77 cfs
Inlet Invert= 29.50', Outlet Invert= 29.40'
35.00' x 3.00' deep channel, n= 0.050 Length= 100.0' Slope= 0.0010 '/'
Side Slope Z-value= 5.0 4.0 '/'

Reach SP: Study Point



Pond 11P: Existing Satellie Lot Detention Pond

Inflow	=	1.44 cfs @	11.99 hrs,	Volume=	0.109 af
Outflow	=	1.13 cfs @	12.11 hrs,	Volume=	0.108 af, Atten= 22%, Lag= 6.9 min
Primary	=	0.18 cfs @	12.11 hrs,	Volume=	0.090 af
Secondary	=	0.95 cfs @	12.11 hrs,	Volume=	0.019 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 48.70' Storage= 1,141 cf
Plug-Flow detention time= 47.6 min calculated for 0.108 af (99% of inflow)
Storage and wetted areas determined by Prismatic sections

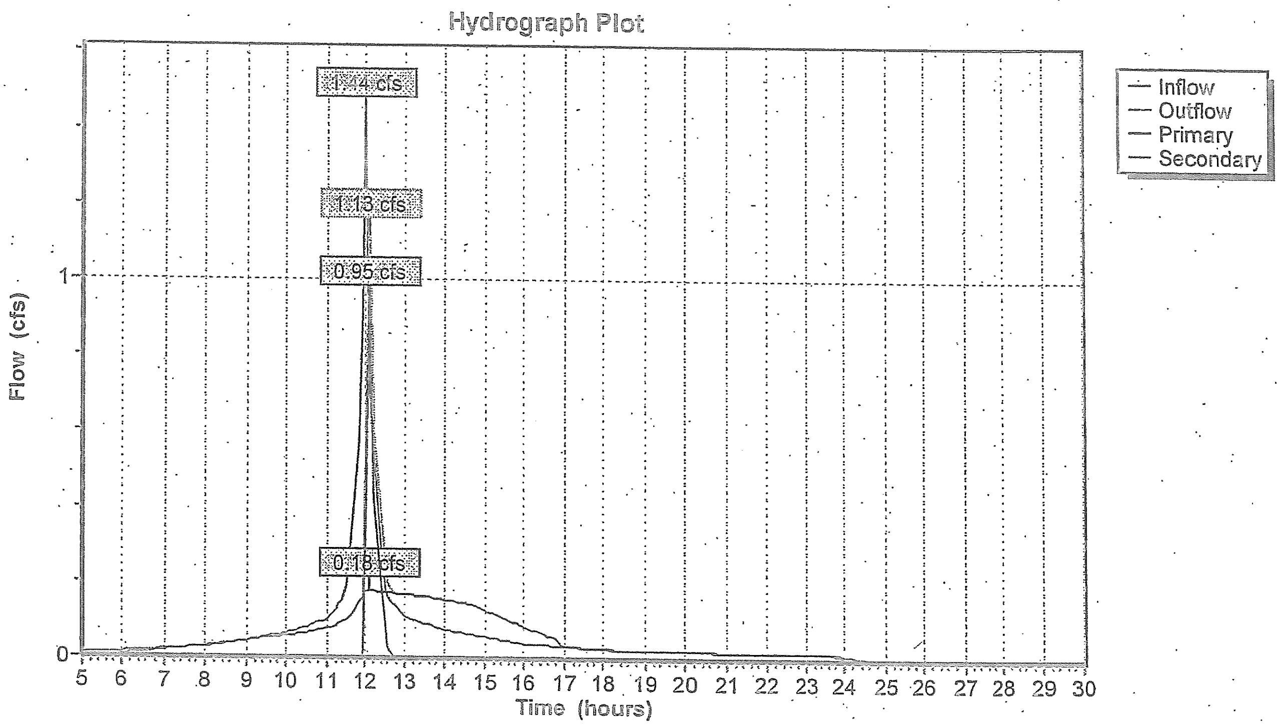
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.00	10	0	0
47.00	117	64	64
48.00	674	396	459
49.00	1,276	975	1,434

Primary OutFlow (Free Discharge)
—1=Orifice/Grate
—2=Orifice/Grate

Secondary OutFlow (Free Discharge)
—3=Sharp-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	46.50'	**1.0" Vert. Orifice/Grate** C= 0.600
2	Primary	46.80'	**2.0" Vert. Orifice/Grate** C= 0.600
3	Secondary	48.50'	**3.1' long x 0.5' high Sharp-Crested Rectangular Weir** 0 End Contraction(s)

Pond 11P: Existing Satellie Lot Detention Pond



Pond 23P: Pond 23

Inflow	=	2.87 cfs @	12.08 hrs,	Volume=	0.249 af
Outflow	=	3.00 cfs @	12.11 hrs,	Volume=	0.249 af, Atten= 0%, Lag= 1.7 min
Primary	=	0.92 cfs @	12.11 hrs,	Volume=	0.207 af
Secondary	=	2.08 cfs @	12.11 hrs,	Volume=	0.042 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 41.19' Storage= 1,015 cf
Plug-Flow detention time= 18.6 min calculated for 0.249 af (100% of inflow)
Storage and wetted areas determined by Prismatic sections

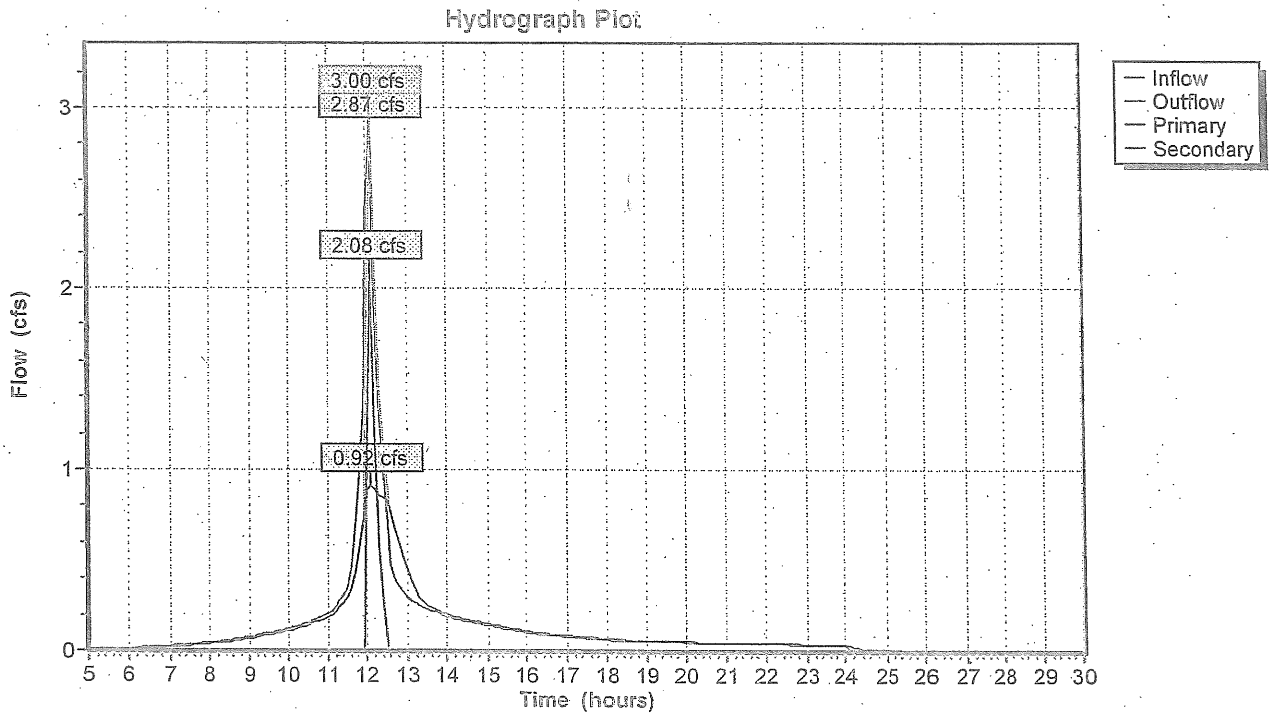
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
40.00	608	0	0
41.00	996	802	802
41.50	1,265	565	1,367

Primary OutFlow (Free Discharge)
↑—1=Culvert

Secondary OutFlow (Free Discharge)
↑—2=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	40.00'	**6.0" x 17.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 37.00' S= 0.1765 '/' n= 0.011 Cc= 0.900
2	Secondary	41.00'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.3

Pond 23P: Pond 23



Time span=5.00-30.00 hrs, dt=0.10 hrs, 251 points
Runoff by SCS TR-20 method, UH=SCS, Type III 24-hr Rainfall=5.50"
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 11X: Satellite Parking
Tc=2.1 min CN=95 Area=0.320 ac Runoff= 1.70 cfs 0.130 af

Subcatchment 12X: North/West of Satellite
Tc=4.8 min CN=81 Area=0.590 ac Runoff= 2.24 cfs 0.169 af

Subcatchment 13X: Existing NORTH-CENTRAL
Tc=15.4 min CN=75 Area=0.910 ac Runoff= 2.20 cfs 0.217 af

Subcatchment 14X: Existing Northeast
Tc=20.4 min CN=74 Area=1.040 ac Runoff= 2.23 cfs 0.240 af

Subcatchment 21X: Existing Central
Tc=7.3 min CN=79 Area=0.850 ac Runoff= 2.75 cfs 0.229 af

Subcatchment 22X: Existing Parking and Entrance Circle
Tc=12.0 min CN=84 Area=0.720 ac Runoff= 2.49 cfs 0.224 af

Subcatchment 23X: Existing Buildings and surrounding
Tc=8.3 min CN=91 Area=0.810 ac Runoff= 3.43 cfs 0.301 af

Subcatchment 24X: Behind Existing Pond
Tc=11.6 min CN=73 Area=0.230 ac Runoff= 0.58 cfs 0.051 af

Reach 1R: Existing Swale Inflow= 13.23 cfs 1.320 af
Length= 200.0' Max Vel= 1.3 fps Capacity= 43.53 cfs Outflow= 12.38 cfs 1.320 af

Reach 2R: Existing Swale Inflow= 7.39 cfs 0.751 af
Length= 80.0' Max Vel= 1.9 fps Capacity= 144.69 cfs Outflow= 7.24 cfs 0.751 af

Reach 3R: Existing Swale Inflow= 2.92 cfs 0.297 af
Length= 120.0' Max Vel= 1.4 fps Capacity= 63.42 cfs Outflow= 2.86 cfs 0.297 af

Reach R11: From P11 to Swale Inflow= 1.34 cfs 0.129 af
Length= 70.0' Max Vel= 0.5 fps Capacity= 33.01 cfs Outflow= 1.19 cfs 0.129 af

Reach R12: 48" RCP Inflow= 2.24 cfs 0.169 af
Length= 90.0' Max Vel= 9.4 fps Capacity= 463.95 cfs Outflow= 2.19 cfs 0.169 af

Reach R22: From 22 to Swale Inflow= 2.49 cfs 0.224 af
Length= 90.0' Max Vel= 0.5 fps Capacity= 27.37 cfs Outflow= 2.27 cfs 0.224 af

Reach R23: From Pond23 to Swale Inflow= 3.94 cfs 0.352 af
Length= 40.0' Max Vel= 0.7 fps Capacity= 21.38 cfs Outflow= 3.85 cfs 0.352 af

Reach SP: Study Point Inflow= 14.61 cfs 1.560 af
Length= 100.0' Max Vel= 0.6 fps Capacity= 239.77 cfs Outflow= 13.94 cfs 1.560 af

Pond 11P: Existing Satellie Lot Detention Pond Peak Storage= 1,169 cf Inflow= 1.70 cfs 0.130 af
Primary= 0.18 cfs 0.100 af Secondary= 1.16 cfs 0.029 af Outflow= 1.34 cfs 0.129 af

Pond 23P: Pond 23 Peak Storage= 1,039 cf Inflow= 3.43 cfs 0.301 af
Primary= 0.93 cfs 0.240 af Secondary= 2.44 cfs 0.061 af Outflow= 3.37 cfs 0.301 af

Runoff Area = 5.470 ac Volume = 1.561 af Average Depth = 3.42"

Subcatchment 11X: Satellite Parking

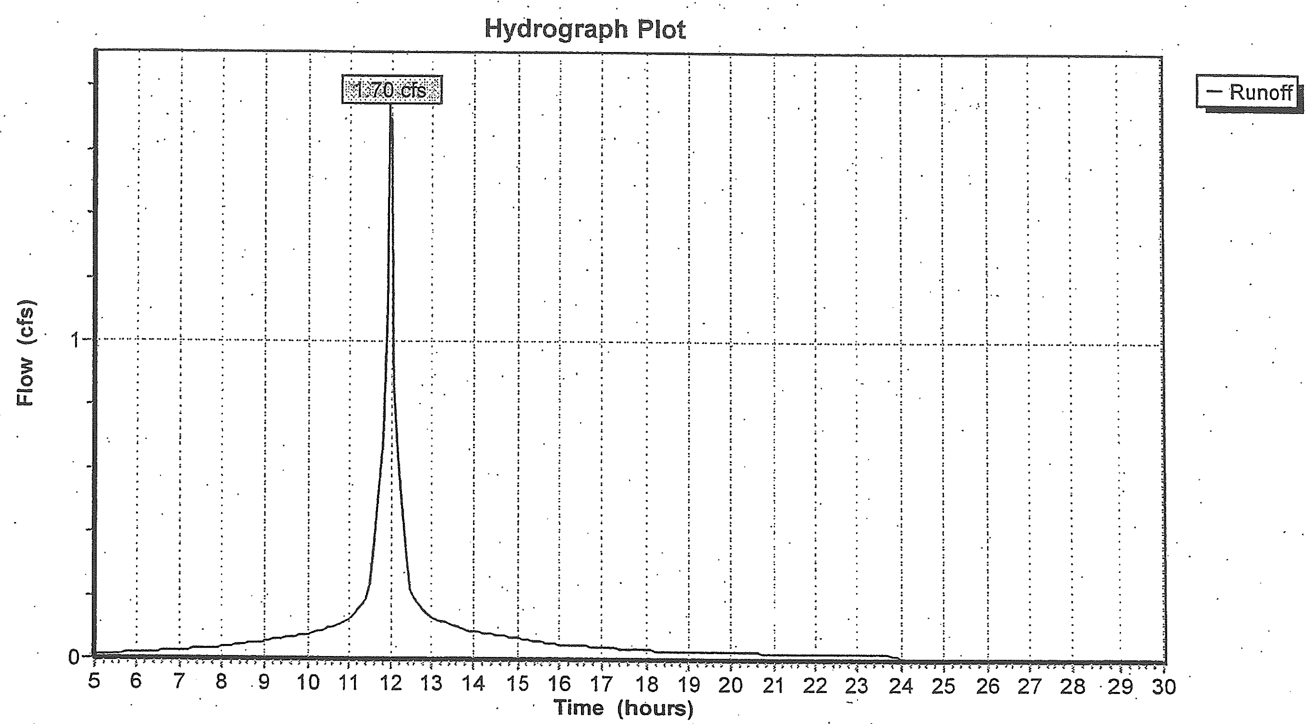
Runoff = 1.70 cfs @ 11.99 hrs, Volume= 0.130 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.270	98	IMPERVIOUS (PARKING LOT)
0.040	74	OPEN SPACE (GOOD)-HSG "C"
0.010	89	RIP RAP-HSG "C"
0.320	95	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0303	1.6		**Sheet Flow, Segment ID:AB** Smooth surfaces n= 0.011 P2= 3.00"
0.1	15	0.3300	4.0		**Shallow Concentrated Flow, Segment ID:BC** Kv= 7.0 fps
0.9	55	0.0200	1.0		**Shallow Concentrated Flow, Segment ID:CD** Short Grass Pasture Kv= 7.0 fps
2.1	170	Total			

Subcatchment 11X: Satellite Parking



Subcatchment 12X: North/West of Satellite

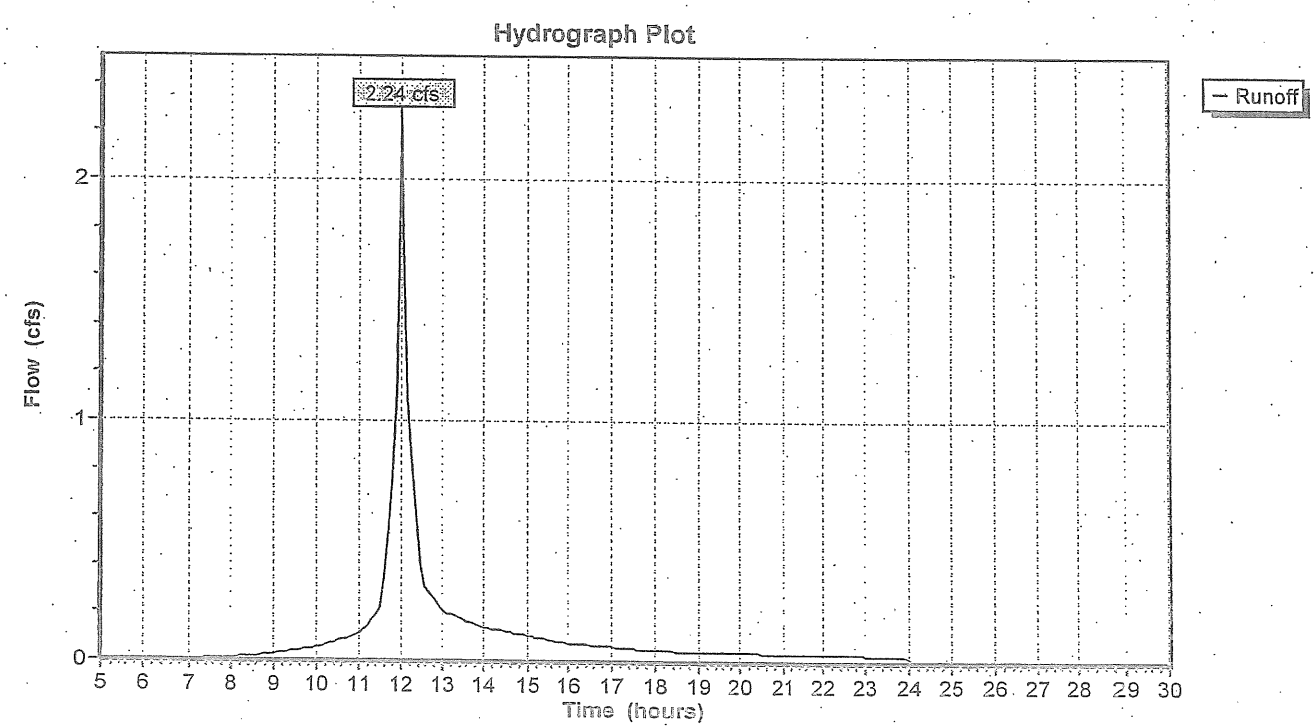
Runoff = 2.24 cfs @ 12.02 hrs, Volume= 0.169 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.020	73	WOODS (FAIR)-HSG "C"
0.400	74	OPEN SPACE (GOOD)-HSG "C"
0.170	98	IMPERVIOUS
0.590	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	16	0.1900	0.2		**Sheet Flow, Segment ID:AB** Grass: Dense n= 0.240 P2= 3.00"
0.8	13	0.5000	0.3		**Sheet Flow, Segment ID:BC** Grass: Dense n= 0.240 P2= 3.00"
1.3	185	0.0270	2.5		**Shallow Concentrated Flow, Segment ID:CD** Grassed Waterway Kv= 15.0 fps
0.2	60	0.0100	5.7	7.00	**Circular Channel (pipe), SEGMENT ID:DE** Diam= 15.0" Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
1.1	165	0.0300	2.6		**Shallow Concentrated Flow, SEGMENT ID:EF** Grassed Waterway Kv= 15.0 fps
4.8	439	Total			

Subcatchment 12X: North/West of Satellite



Subcatchment 13X: Existing NORTH-CENTRAL

Runoff = 2.20 cfs @ 12.18 hrs, Volume= 0.217 af

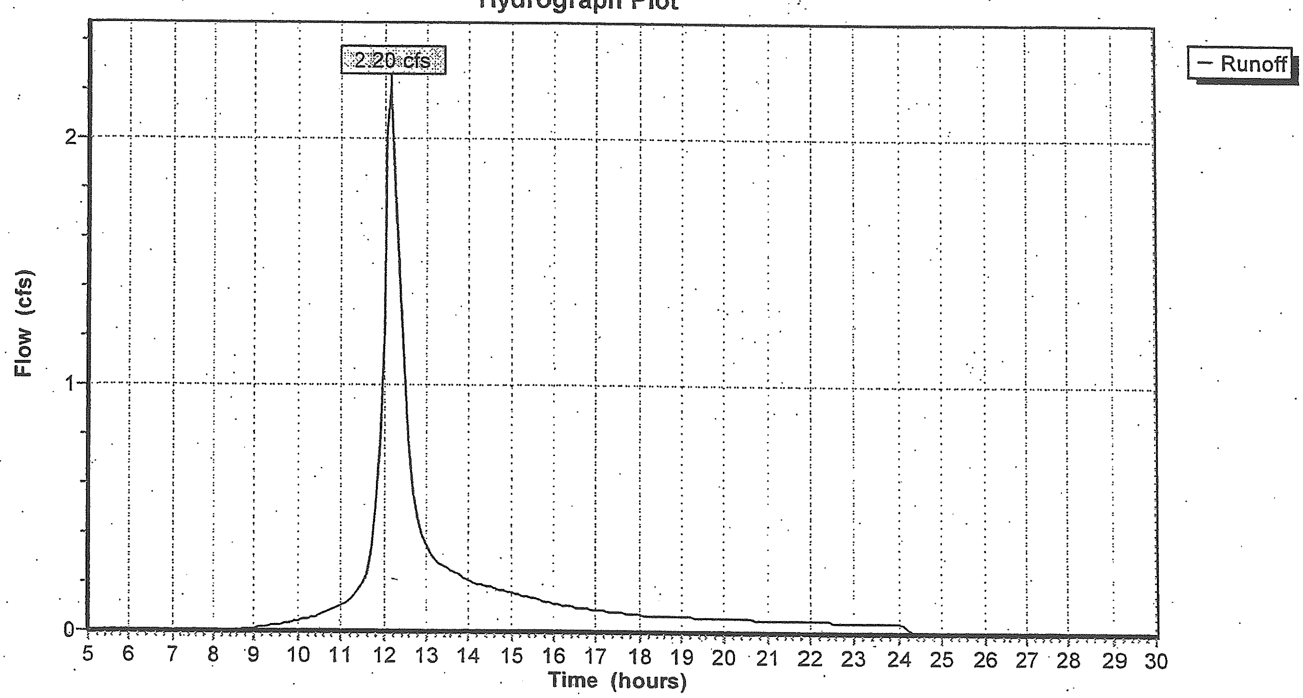
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.000	98	IMPERVIOUS (PAVEMENT)
0.540	73	WOODS (FAIR)-HSG "C"
0.130	74	OPEN SPACE (GOOD)-HSG "C"
0.240	79	WOODS (FAIR)-HSG "D"
0.910	75	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	35	0.0700	0.1		**Sheet Flow, Segment ID:AB** Woods: Light underbrush n= 0.400 P2= 3.00"
6.7	65	0.1700	0.2		**Sheet Flow, Segment ID:BC** Woods: Light underbrush n= 0.400 P2= 3.00"
1.2	130	0.1300	1.8		**Shallow Concentrated Flow, SegmentC-D** Woodland Kv= 5.0 fps
1.7	100	0.0400	1.0		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
15.4	330	Total			

Subcatchment 13X: Existing NORTH-CENTRAL

Hydrograph Plot



Subcatchment 14X: Existing Northeast

Runoff = 2.23 cfs @ 12.24 hrs, Volume= 0.240 af

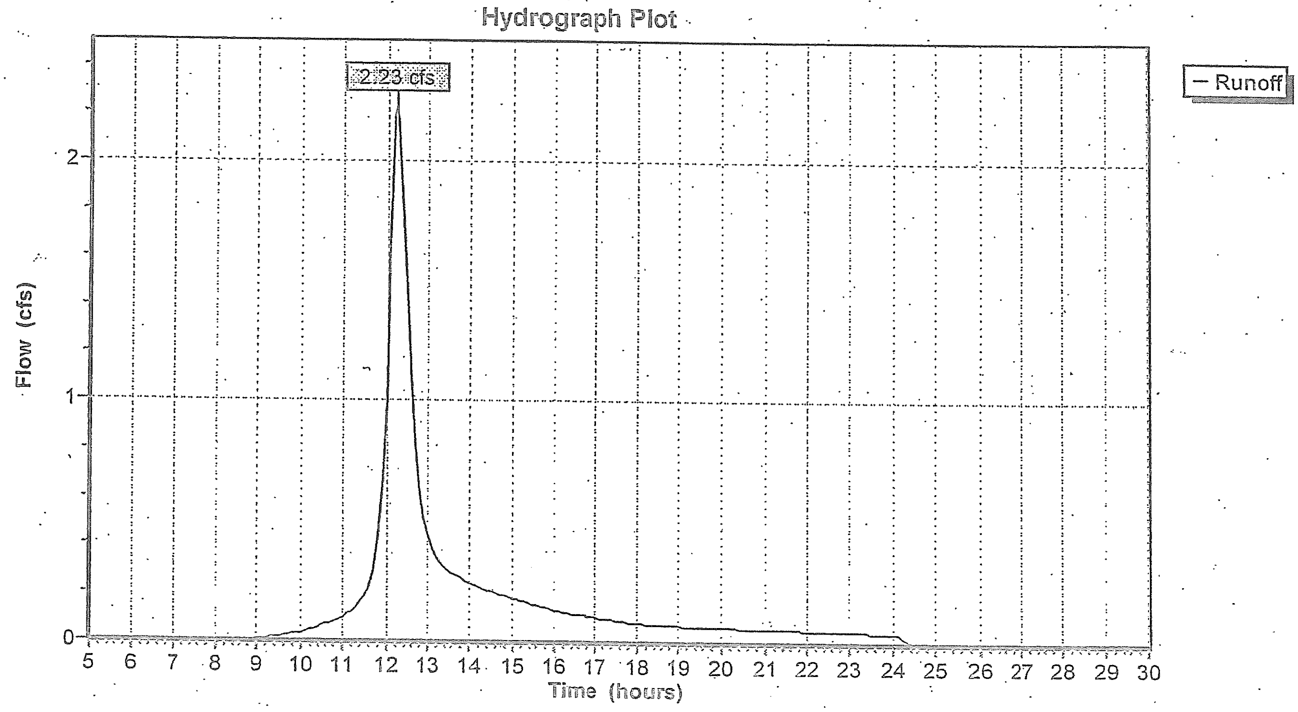
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.810	73	Woods, Fair, HSG C
0.230	79	Woods, Fair, HSG D
1.040	74	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.5	60	0.0250	0.1		**Sheet Flow, Segment AB** Woods: Light underbrush n= 0.400 P2= 3.00"
4.0	40	0.2250	0.2		**Sheet Flow, SegmentBC** Woods: Light underbrush n= 0.400 P2= 3.00"
0.8	90	0.1444	1.9		**Shallow Concentrated Flow, SegmentCD** Woodland Kv= 5.0 fps
0.1	25	0.4400	3.3		**Shallow Concentrated Flow, SegmentDE** Woodland Kv= 5.0 fps
2.0	70	0.0140	0.6		**Shallow Concentrated Flow, SegmentEF** Woodland Kv= 5.0 fps
20.4	285	Total			

Subcatchment 14X: Existing Northeast

Hydrograph Plot



Subcatchment 21X: Existing Central

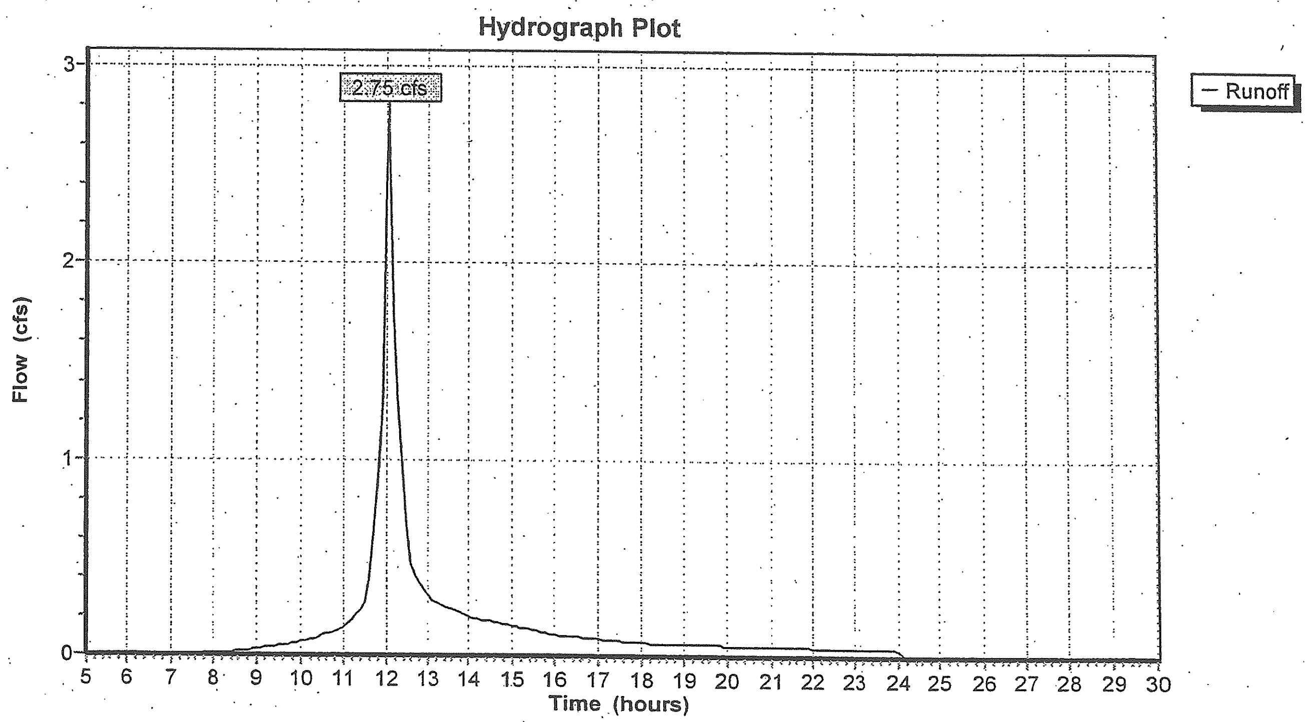
Runoff = 2.75 cfs @ 12.07 hrs, Volume= 0.229 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.260	73	WOODS (FAIR)-HSG "C"
0.250	74	OPEN SPACE (GOODG "C"
0.200	79	WOODS (FAIR)-HSD "D"
0.140	98	IMPERVIOUS (BLDG, PAVEMENT)
0.850	79	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	75	0.0600	0.2		**Sheet Flow, Segment ID:AB** Grass: Short n= 0.150 P2= 3.00"
0.7	15	0.4000	0.4		**Sheet Flow, SegmentBC** Grass: Short n= 0.150 P2= 3.00"
0.2	30	0.2700	2.6		**Shallow Concentrated Flow, Segment ID:CD** Woodland Kv= 5.0 fps
1.2	80	0.0500	1.1		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
7.3	200	Total			

Subcatchment 21X: Existing Central



Subcatchment 22X: Existing Parking and Entrance Circle

Runoff = 2.49 cfs @ 12.12 hrs, Volume= 0.224 af

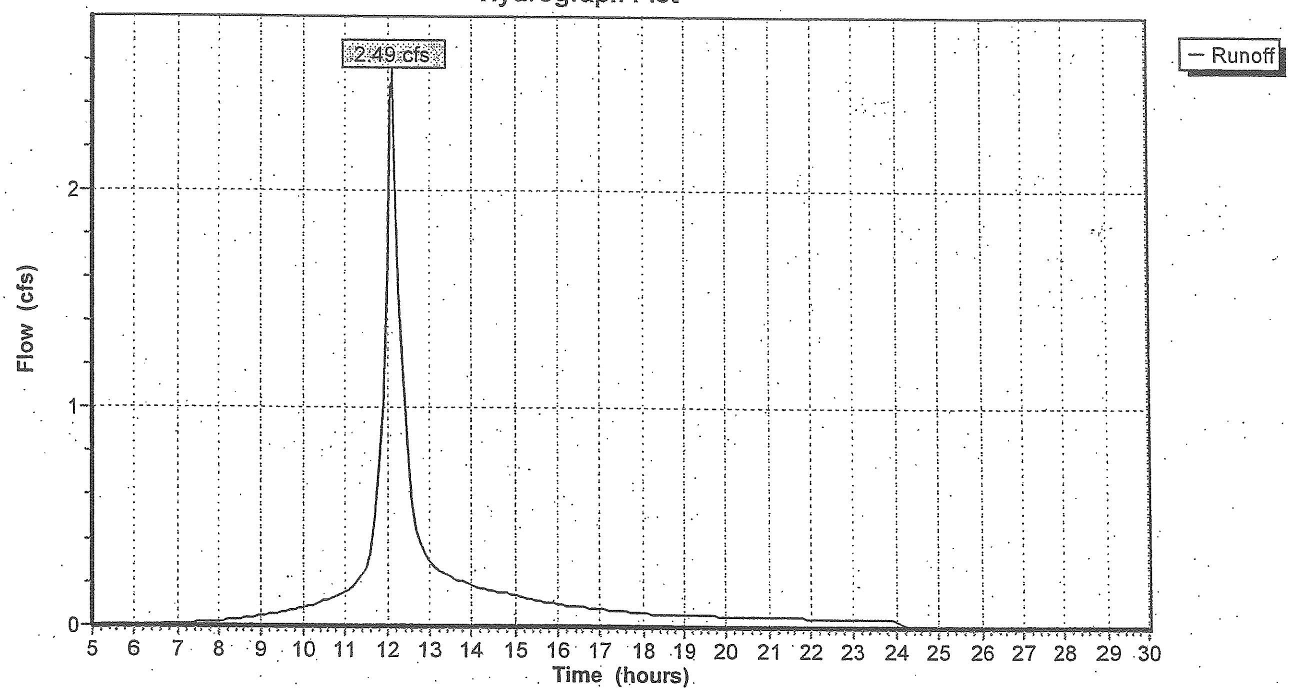
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.130	73	WOODS (FAIR)-HSG "C"
0.280	74	OPEN SPACE (GOODG "C"
0.310	98	IMPERVIOUS (BLDG, PAVEMENT)
0.720	84	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0167	0.1		**Sheet Flow, Segment ID:AB** Grass: Short n= 0.150 P2= 3.00"
0.4	20	0.0125	0.8		**Sheet Flow, SegmentBC** Smooth surfaces n= 0.011 P2= 3.00"
7.9	65	0.1100	0.1		**Sheet Flow, SegmentCD** Woods: Light underbrush n= 0.400 P2= 3.00"
0.8	70	0.0860	1.5		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
0.4	90	0.0333	3.7		**Shallow Concentrated Flow, Segment ID:EF** Paved Kv= 20.3 fps
0.1	65	0.0500	12.0	9.42	**Circular Channel (pipe), SegmentFG** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011
12.0	325	Total			

Subcatchment 22X: Existing Parking and Entrance Circle

Hydrograph Plot



Subcatchment 23X: Existing Buildings and surrounding

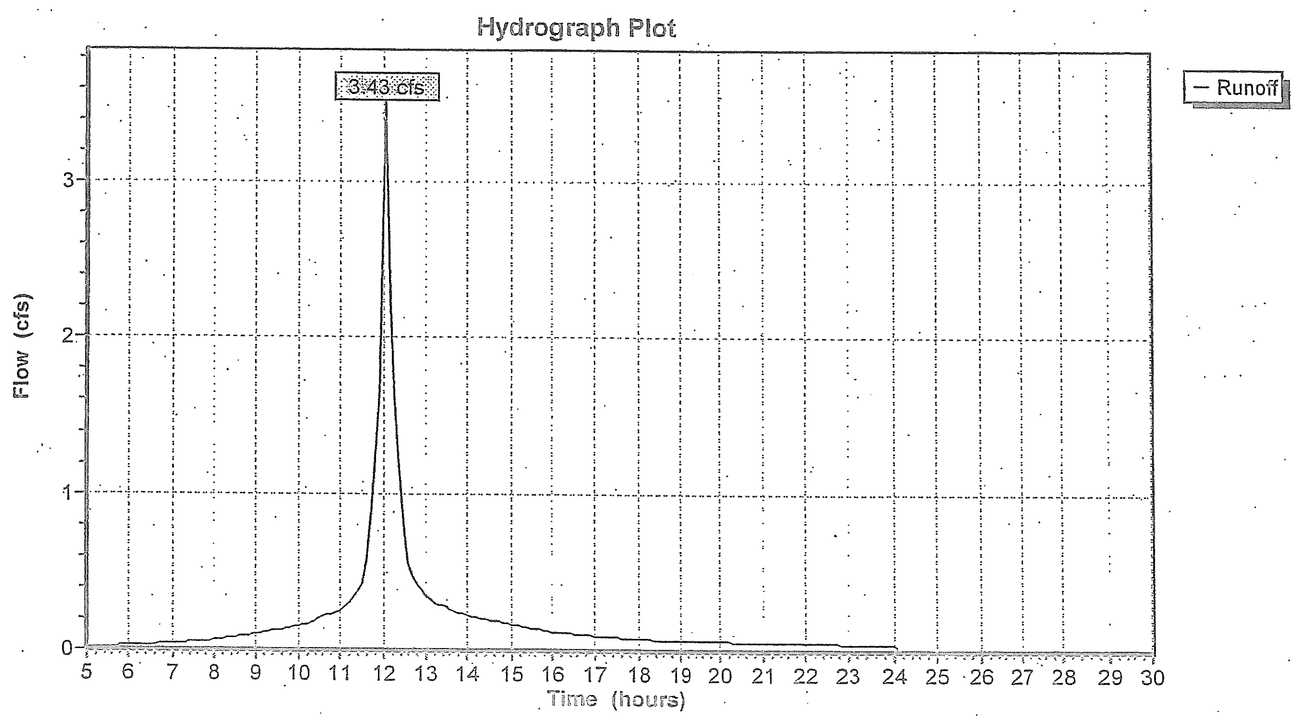
Runoff = 3.43 cfs @ 12.08 hrs, Volume= 0.301 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.310	79	OPEN SPACE (FAIR)-HSG "C"
0.200	98	Paved parking & roofs
0.300	98	Paved parking & roofs
0.810	91	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	10	0.2000	0.3		**Sheet Flow, Segment ID:AB** Grass: Short n= 0.150 P2= 3.00"
6.4	90	0.0500	0.2		**Sheet Flow, Segment ID:BC** Grass: Short n= 0.150 P2= 3.00"
0.4	60	0.1100	2.3		**Shallow Concentrated Flow, Segment ID:CD** Short Grass Pasture Kv= 7.0 fps
0.0	10	0.3000	3.8		**Shallow Concentrated Flow, Segment ID:DE** Short Grass Pasture Kv= 7.0 fps
0.9	95	0.0630	1.8		**Shallow Concentrated Flow, SegmentEF** Short Grass Pasture Kv= 7.0 fps
8.3	265	Total			

Subcatchment 23X: Existing Buildings and surrounding



Subcatchment 24X: Behind Existing Pond

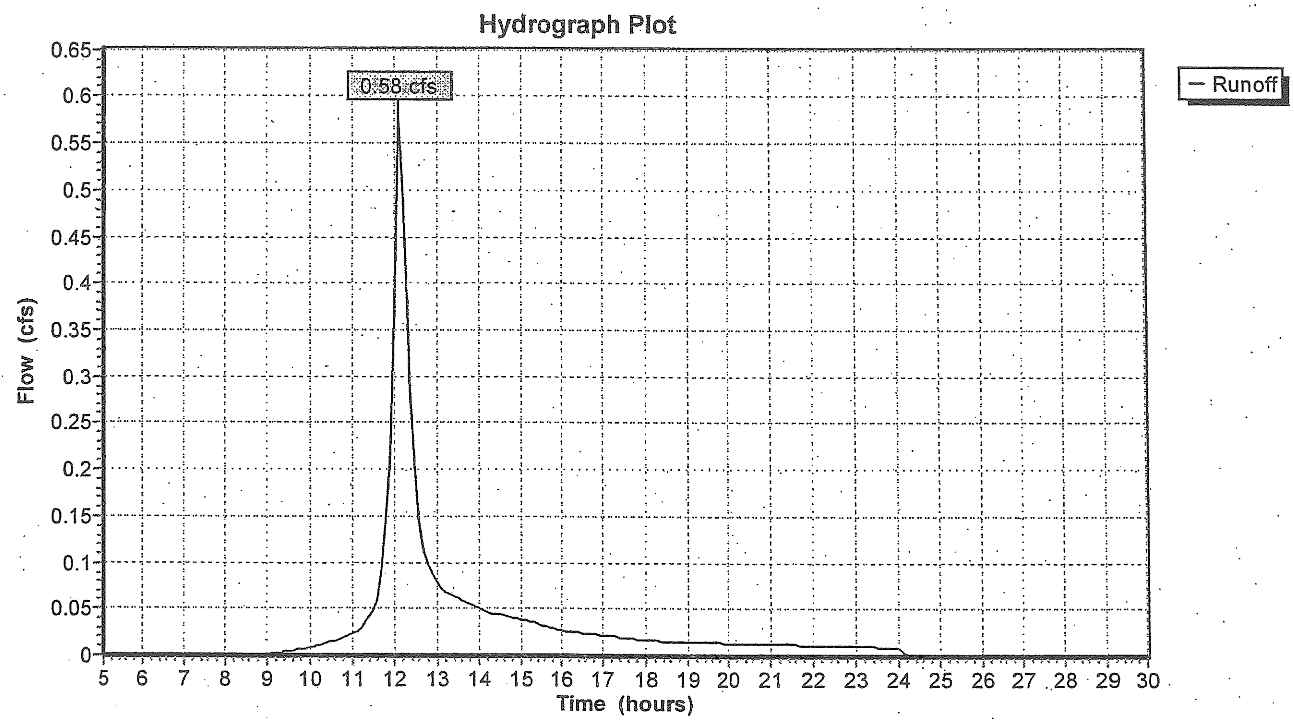
Runoff = 0.58 cfs @ 12.12 hrs, Volume= 0.051 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.230	73	Woods, Fair, HSG C

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	45	0.1111	0.1		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.00"
4.2	55	0.0545	0.2		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
1.5	125	0.0800	1.4		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
11.6	225	Total			

Subcatchment 24X: Behind Existing Pond



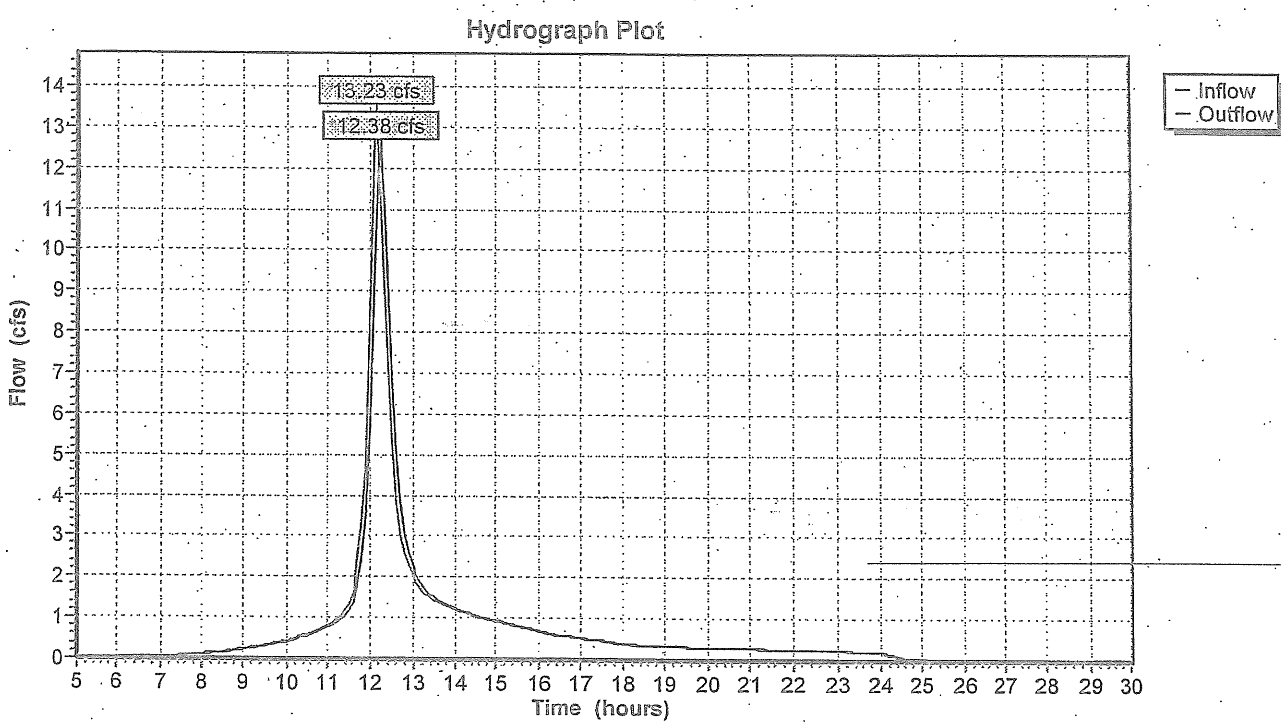
Reach 1R: Existing Swale

Inflow	=	13.23 cfs @	12.14 hrs, Volume=	1.320 af	
Outflow	=	12.38 cfs @	12.23 hrs, Volume=	1.320 af,	Atten= 6%, Lag= 5.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.3 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 0.3 fps, Avg. Travel Time= 9.8 min

Peak Depth= 1.05'
Capacity at bank full= 43.53 cfs
Inlet Invert= 30.00', Outlet Invert= 29.50'
7.00' x 2.00' deep channel, n= 0.050 Length= 200.0' Slope= 0.0025 '/'
Side Slope Z-value= 3.0 2.0 '/'

Reach 1R: Existing Swale



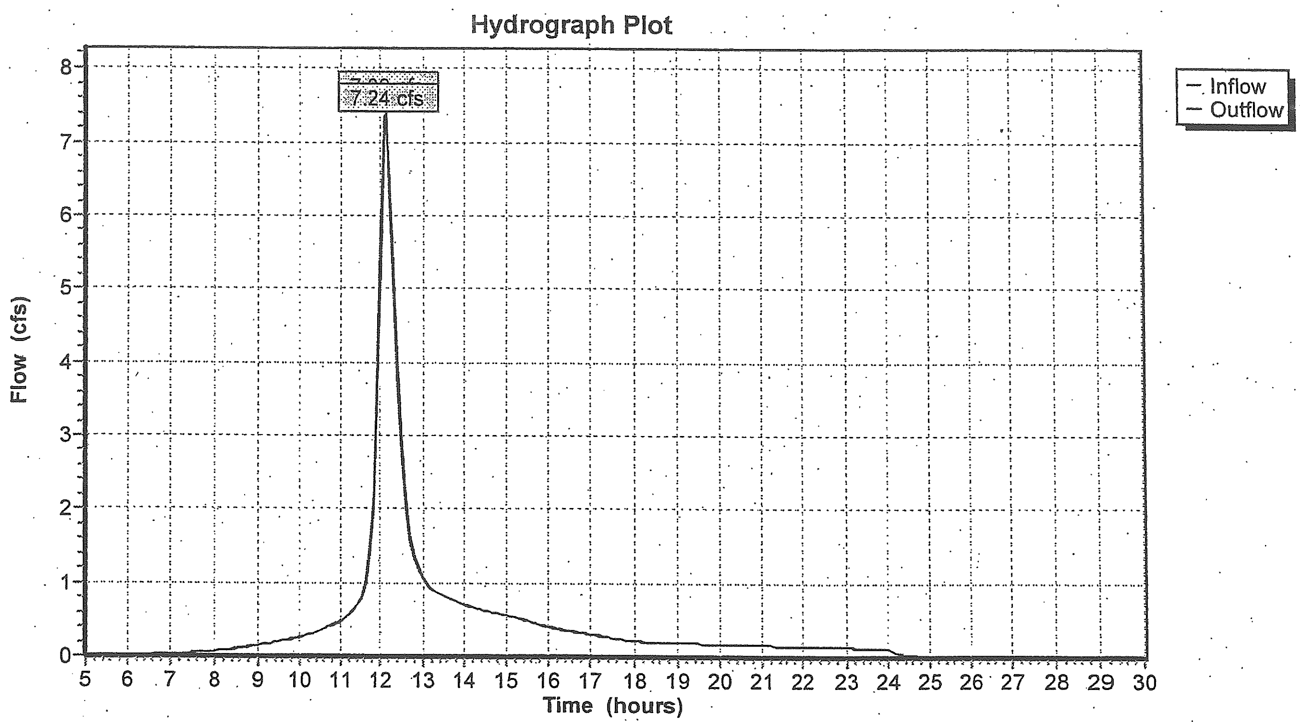
Reach 2R: Existing Swale

Inflow	=	7.39 cfs @ 12.12 hrs, Volume=	0.751 af
Outflow	=	7.24 cfs @ 12.13 hrs, Volume=	0.751 af, Atten= 2%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.9 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.5 fps, Avg. Travel Time= 2.4 min

Peak Depth= 0.63'
Capacity at bank full= 144.69 cfs
Inlet Invert= 30.80', Outlet Invert= 30.00'
5.00' x 3.00' deep channel, n= 0.050 Length= 80.0' Slope= 0.0100 '/'
Side Slope Z-value= 2.0 '/'

Reach 2R: Existing Swale



Reach 3R: Existing Swale

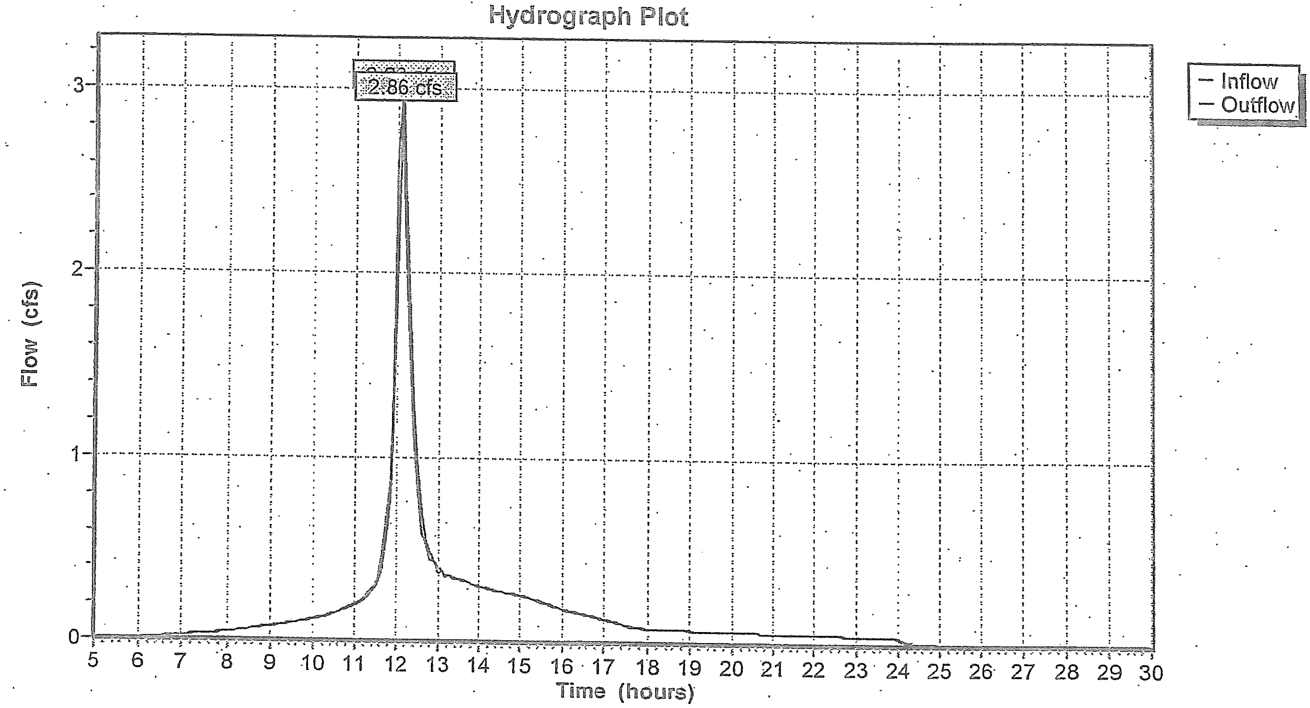
Inflow	=	2.92 cfs @ 12.07 hrs,	Volume=	0.297 af
Outflow	=	2.86 cfs @ 12.12 hrs,	Volume=	0.297 af, Atten= 2%, Lag= 2.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.4 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.4 fps, Avg. Travel Time= 5.1 min

Peak Depth= 0.37'
Capacity at bank full= 63.42 cfs
Inlet Invert= 32.00', Outlet Invert= 30.80'
5.00' x 2.00' deep channel, n= 0.050 Length= 120.0' Slope= 0.0100 '/'
Side Slope Z-value= 2.0 '/'

Reach 3R: Existing Swale

Hydrograph Plot



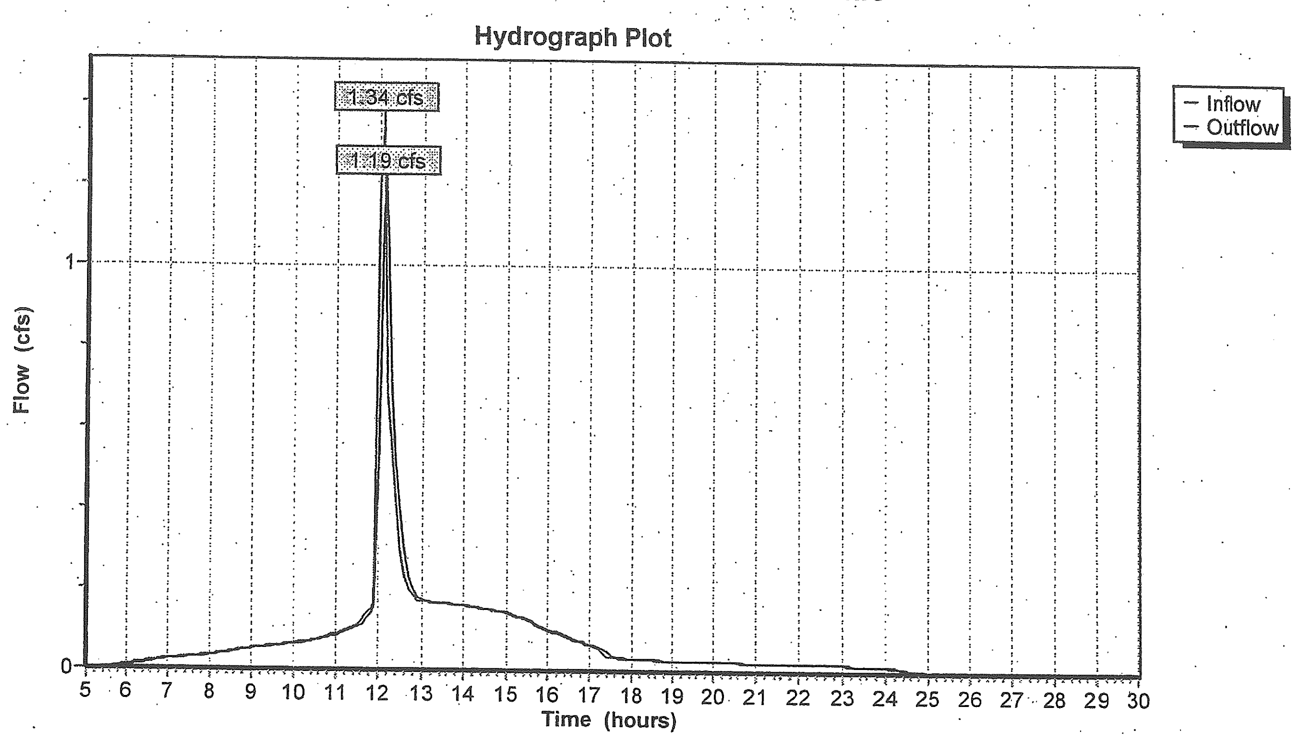
Reach R11: From P11 to Swale

Inflow = 1.34 cfs @ 12.06 hrs, Volume= 0.129 af
Outflow = 1.19 cfs @ 12.14 hrs, Volume= 0.129 af, Atten= 12%, Lag= 4.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.5 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 9.0 min

Peak Depth= 0.17'
Capacity at bank full= 33.01 cfs
Inlet Invert= 45.90', Outlet Invert= 32.00'
15.00' x 1.00' deep channel, n= 0.400 Length= 70.0' Slope= 0.1986 '/'
Side Slope Z-value= 10.0 '/'

Reach R11: From P11 to Swale



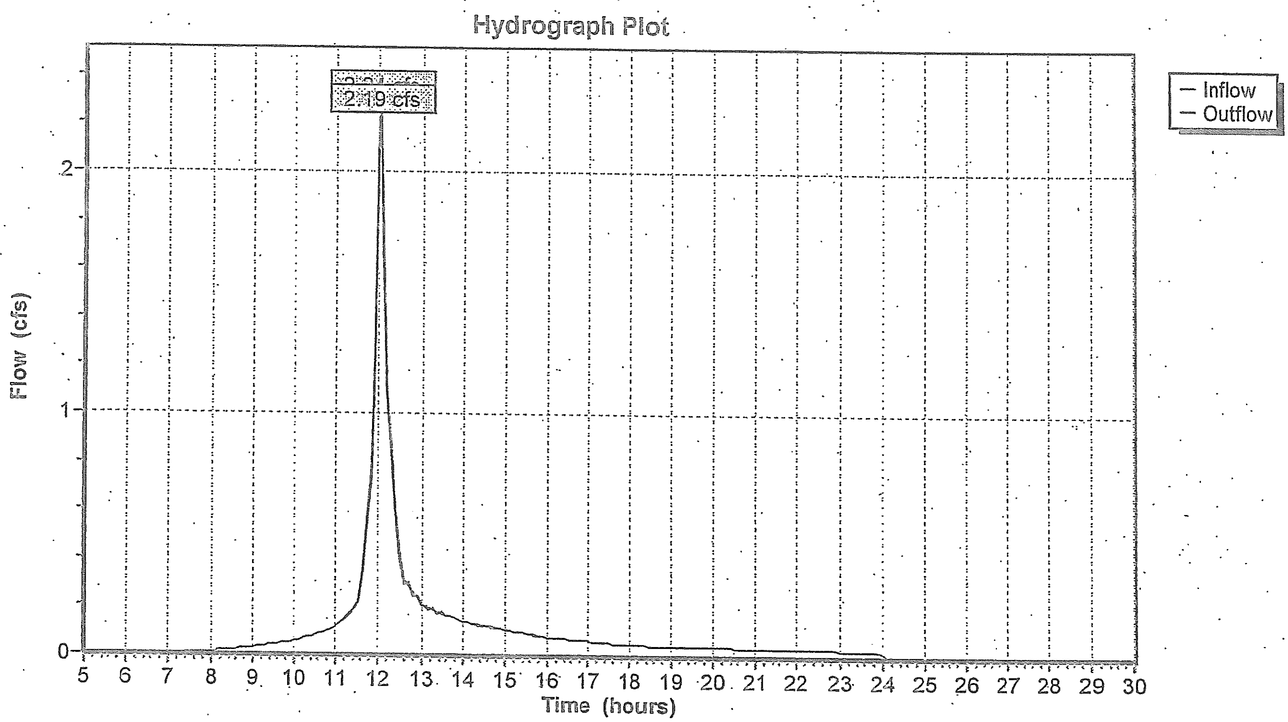
Reach R12: 48" RCP

Inflow = 2.24 cfs @ 12.02 hrs, Volume= 0.169 af
Outflow = 2.19 cfs @ 12.02 hrs, Volume= 0.169 af, Atten= 2%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 9.4 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.8 fps, Avg. Travel Time= 0.4 min

Peak Depth= 0.20'
Capacity at bank full= 463.95 cfs
Inlet Invert= 40.00', Outlet Invert= 32.00'
48.0" Diameter Pipe n= 0.012 Length= 90.0' Slope= 0.0889 '/'

Reach R12: 48" RCP



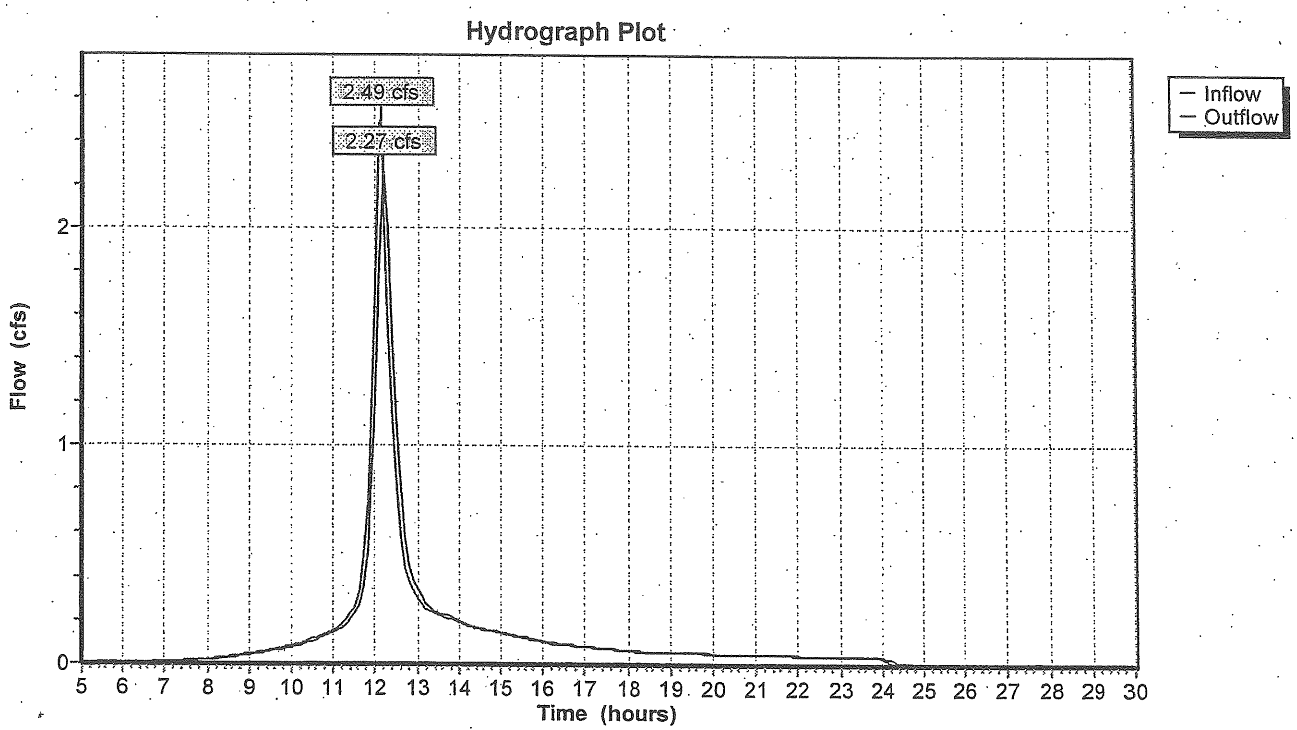
Reach R22: From 22 to Swale

Inflow	=	2.49 cfs @	12.12 hrs,	Volume=	0.224 af
Outflow	=	2.27 cfs @	12.21 hrs,	Volume=	0.224 af, Atten= 9%, Lag= 5.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.5 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 10.4 min

Peak Depth= 0.26'
Capacity at bank full= 27.37 cfs
Inlet Invert= 44.00', Outlet Invert= 30.50'
15.00' x 1.00' deep channel, n= 0.400 Length= 90.0' Slope= 0.1500 '/'
Side Slope Z-value= 15.0 2.0 '/'

Reach R22: From 22 to Swale



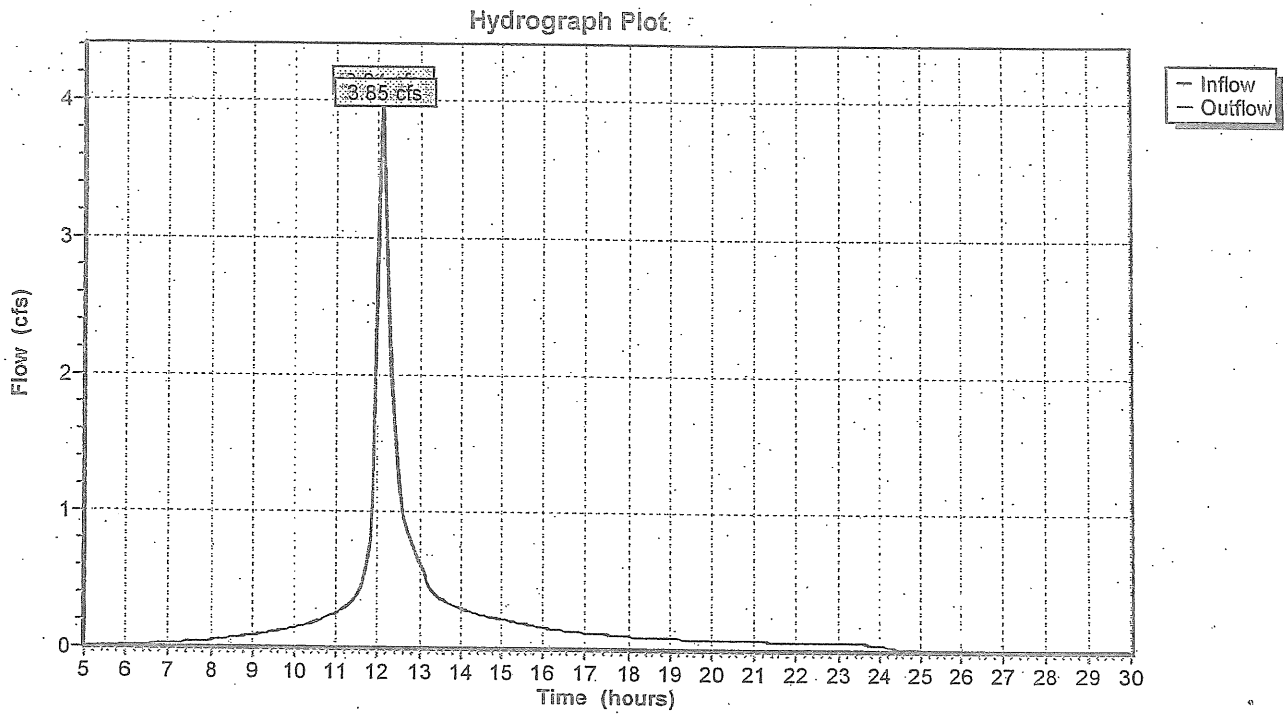
Reach R23: From Pond23 to Swale

Inflow = 3.94 cfs @ 12.10 hrs, Volume= 0.352 af
Outflow = 3.85 cfs @ 12.12 hrs, Volume= 0.352 af, Atten= 2%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.7 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 0.2 fps, Avg. Travel Time= 3.2 min

Peak Depth= 0.48'
Capacity at bank full= 21.38 cfs
Inlet Invert= 37.00', Outlet Invert= 30.00'
5.00' x 1.00' deep channel, n= 0.400 Length= 40.0' Slope= 0.1750 '/'
Side Slope Z-value= 15.0 '/'

Reach R23: From Pond23 to Swale



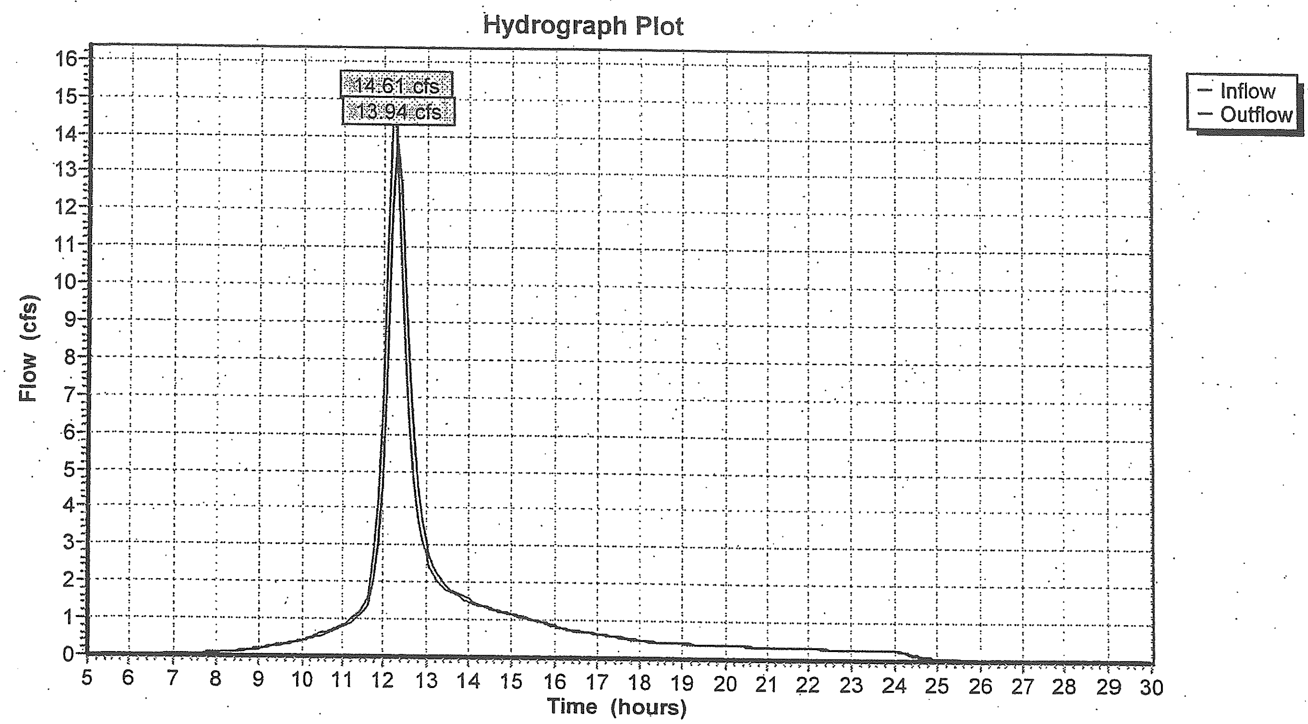
Reach SP: Study Point

Inflow = 14.61 cfs @ 12.23 hrs, Volume= 1.560 af
Outflow = 13.94 cfs @ 12.31 hrs, Volume= 1.560 af, Atten= 5%, Lag= 5.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.6 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 0.2 fps, Avg. Travel Time= 10.1 min

Peak Depth= 0.60'
Capacity at bank full= 239.77 cfs
Inlet Invert= 29.50', Outlet Invert= 29.40'
35.00' x 3.00' deep channel, n= 0.050 Length= 100.0' Slope= 0.0010 '/'
Side Slope Z-value= 5.0 4.0 '/'

Reach SP: Study Point



Pond 11P: Existing Satellie Lot Detention Pond

Inflow = 1.70 cfs @ 11.99 hrs, Volume= 0.130 af
Outflow = 1.34 cfs @ 12.06 hrs, Volume= 0.129 af, Atten= 21%, Lag= 4.4 min
Primary = 0.18 cfs @ 12.06 hrs, Volume= 0.100 af
Secondary = 1.16 cfs @ 12.06 hrs, Volume= 0.029 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 48.73' Storage= 1,169 cf
Plug-Flow detention time= 44.2 min calculated for 0.128 af (99% of inflow)
Storage and wetted areas determined by Prismatic sections

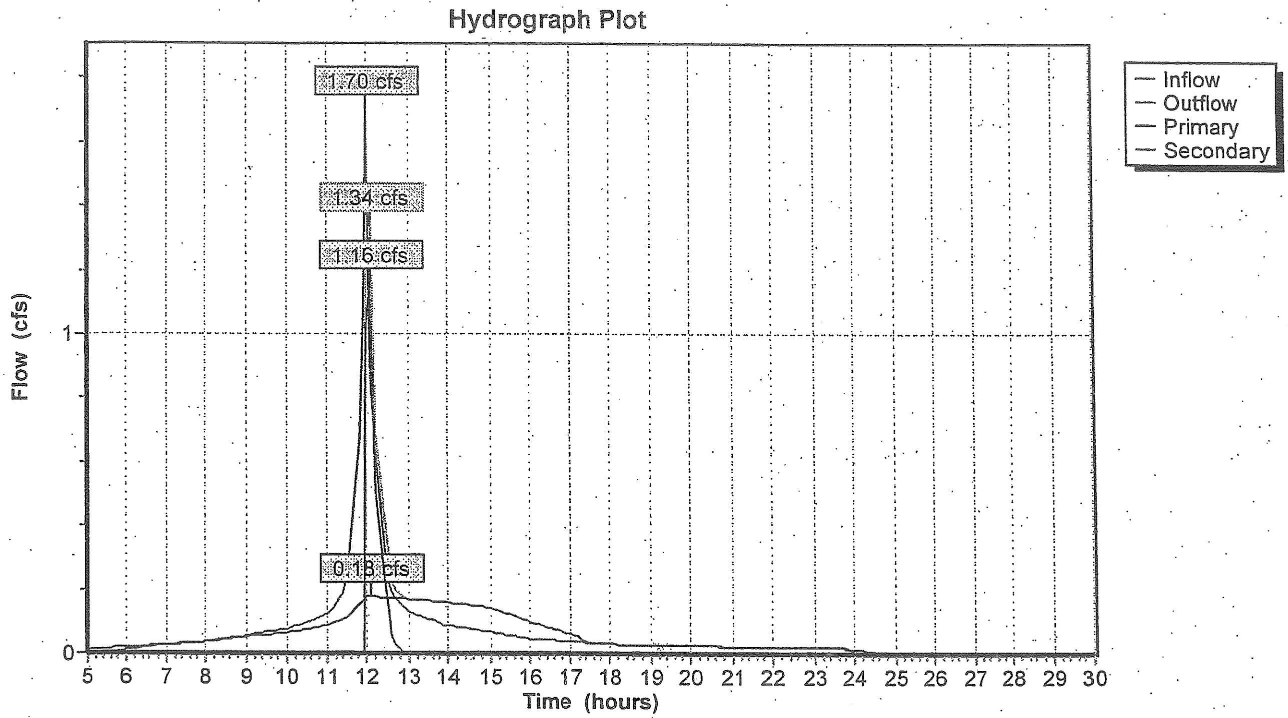
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.00	10	0	0
47.00	117	64	64
48.00	674	396	459
49.00	1,276	975	1,434

Primary OutFlow (Free Discharge)
├─1=Orifice/Grate
└─2=Orifice/Grate

Secondary OutFlow (Free Discharge)
└─3=Sharp-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	46.50'	**1.0" Vert. Orifice/Grate** C= 0.600
2	Primary	46.80'	**2.0" Vert. Orifice/Grate** C= 0.600
3	Secondary	48.50'	**3.1' long x 0.5' high Sharp-Crested Rectangular Weir** 0 End Contraction(s)

Pond 11P: Existing Satellie Lot Detention Pond



Pond 23P: Pond 23

Inflow	=	3.43 cfs @	12.08 hrs,	Volume=	0.301 af
Outflow	=	3.37 cfs @	12.09 hrs,	Volume=	0.301 af, Atten= 2%, Lag= 1.0 min
Primary	=	0.93 cfs @	12.09 hrs,	Volume=	0.240 af
Secondary	=	2.44 cfs @	12.09 hrs,	Volume=	0.061 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 41.21' Storage= 1,039 cf
Plug-Flow detention time= 16.5 min calculated for 0.300 af (100% of inflow)
Storage and wetted areas determined by Prismatic sections

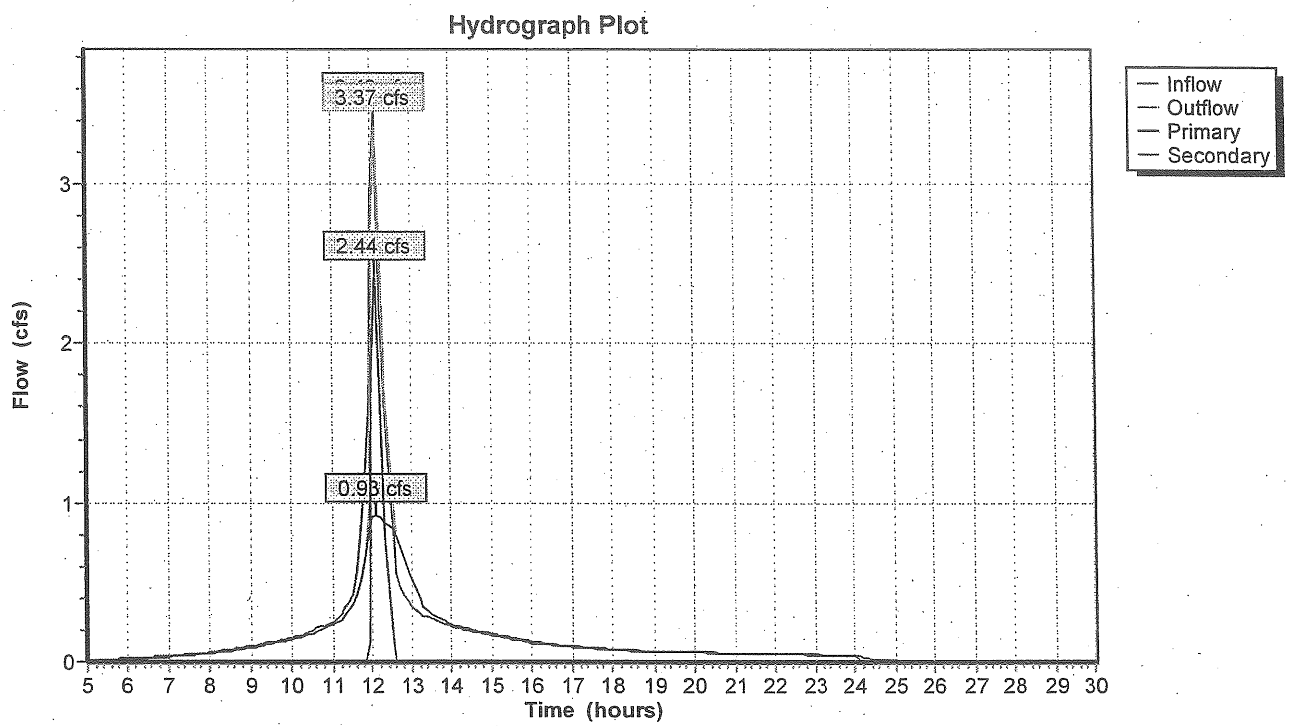
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
40.00	608	0	0
41.00	996	802	802
41.50	1,265	565	1,367

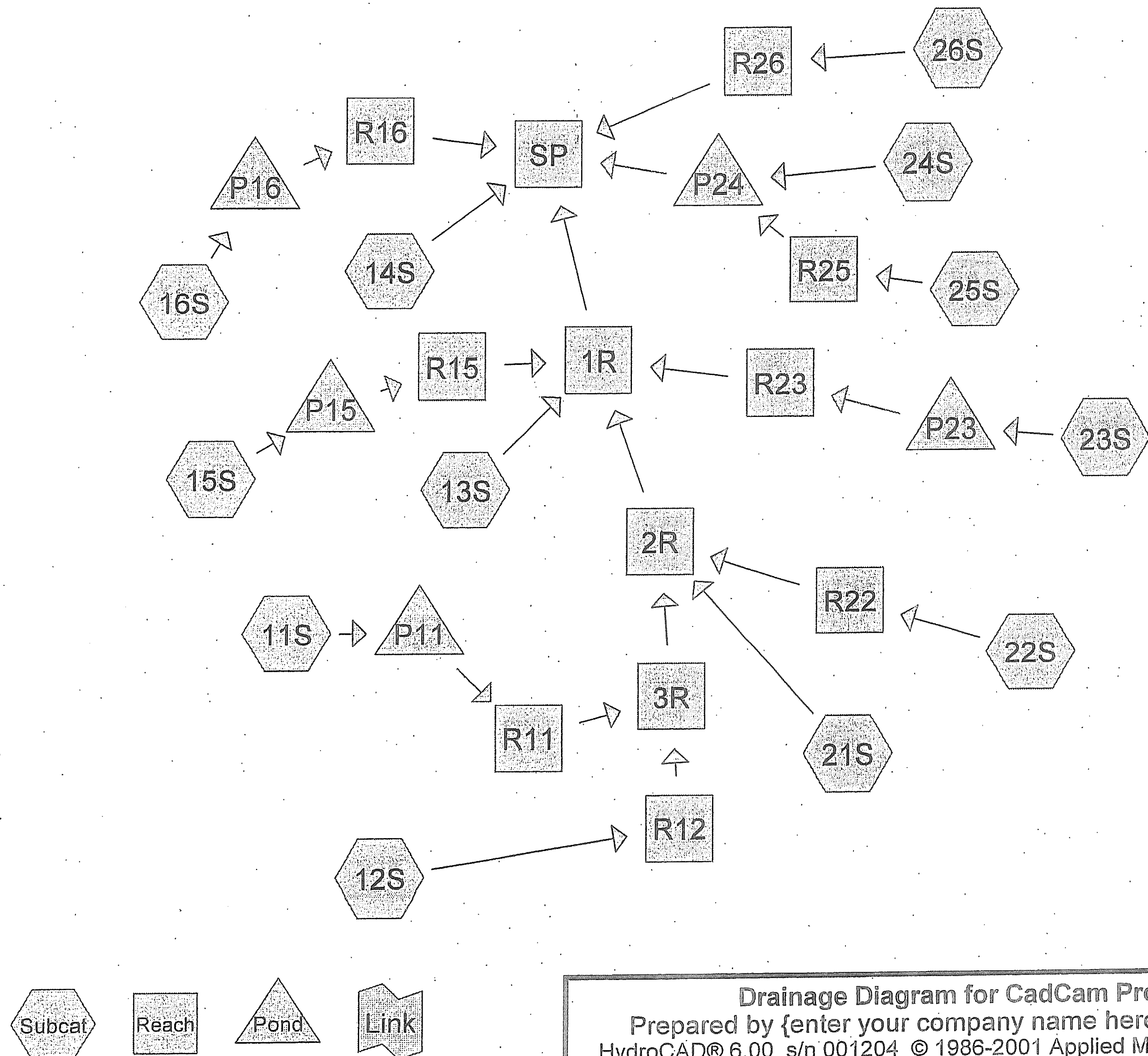
Primary OutFlow (Free Discharge)
└─1=Culvert

Secondary OutFlow (Free Discharge)
└─2=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	40.00'	**6.0" x 17.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 37.00' S= 0.1765 '/' n= 0.011 Cc= 0.900
2	Secondary	41.00'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.3

Pond 23P: Pond 23





Drainage Diagram for CadCam Proposed
Prepared by {enter your company name here} 2/22/2006
HydroCAD® 6.00 s/n 001204 © 1986-2001 Applied Microcomputer Systems

Time span=5.00-30.00 hrs, dt=0.10 hrs, 251 points
Runoff by SCS TR-20 method, UH=SCS, Type III 24-hr Rainfall=3.00"
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 11S: Satellite Parking
Tc=2.1 min CN=95 Area=0.320 ac Runoff= 0.89 cfs 0.065 af

Subcatchment 12S: North/West of Satellite
Tc=4.8 min CN=81 Area=0.590 ac Runoff= 0.85 cfs 0.065 af

Subcatchment 13S: Proposed NORTH-CENTRAL
Tc=9.7 min CN=75 Area=0.670 ac Runoff= 0.61 cfs 0.054 af

Subcatchment 14S: Proposed Northeast
Tc=14.2 min CN=76 Area=0.590 ac Runoff= 0.49 cfs 0.050 af

Subcatchment 15S: Proposed Parking
Tc=1.4 min CN=91 Area=0.480 ac Runoff= 1.15 cfs 0.083 af

Subcatchment 16S: Proposed Parking
Tc=1.5 min CN=85 Area=0.220 ac Runoff= 0.42 cfs 0.029 af

Subcatchment 21S: Proposed Central
Tc=8.6 min CN=76 Area=0.530 ac Runoff= 0.52 cfs 0.045 af

Subcatchment 22S: Existing Parking and Entrance Circle
Tc=11.8 min CN=85 Area=0.860 ac Runoff= 1.29 cfs 0.114 af

Subcatchment 23S: Proposed Buildings
Tc=5.0 min CN=98 Area=0.480 ac Runoff= 1.32 cfs 0.109 af

Subcatchment 24S: Expanded Parking
Tc=3.8 min CN=89 Area=0.280 ac Runoff= 0.62 cfs 0.044 af

Subcatchment 25S: Access & Rear Parking
Tc=3.2 min CN=93 Area=0.330 ac Runoff= 0.86 cfs 0.062 af

Subcatchment 26S: Rear of Building
Tc=7.8 min CN=74 Area=0.120 ac Runoff= 0.10 cfs 0.009 af

Reach 1R: Existing Swale Inflow= 3.03 cfs 0.506 af
Length= 200.0' Max Vel= 0.8 fps Capacity= 43.53 cfs Outflow= 2.96 cfs 0.505 af

Reach 2R: Existing Swale Inflow= 2.28 cfs 0.288 af
Length= 80.0' Max Vel= 1.3 fps Capacity= 144.69 cfs Outflow= 2.27 cfs 0.288 af

Reach 3R: Existing Swale Inflow= 0.95 cfs 0.129 af
Length= 120.0' Max Vel= 0.9 fps Capacity= 63.42 cfs Outflow= 0.87 cfs 0.129 af

Reach R11: From P11 to Swale Inflow= 0.17 cfs 0.064 af
Length= 70.0' Max Vel= 0.2 fps Capacity= 33.01 cfs Outflow= 0.17 cfs 0.064 af

Reach R12: 48" RCP Inflow= 0.85 cfs 0.065 af
Length= 90.0' Max Vel= 7.0 fps Capacity= 463.95 cfs Outflow= 0.82 cfs 0.065 af

Reach R15: From P15 to Swale Inflow= 0.45 cfs 0.059 af
Length= 100.0' Max Vel= 0.2 fps Capacity= 45.62 cfs Outflow= 0.32 cfs 0.058 af

Reach R16: From P16 to Swale Inflow= 0.11 cfs 0.023 af
Length= 120.0' Max Vel= 0.1 fps Capacity= 28.43 cfs Outflow= 0.07 cfs 0.023 af

Reach R22: From 22 to Swale Inflow= 1.29 cfs 0.114 af
Length= 90.0' Max Vel= 0.4 fps Capacity= 27.37 cfs Outflow= 1.15 cfs 0.114 af

Reach R23: From 25 to Swale Inflow= 0.30 cfs 0.107 af
Length= 50.0' Max Vel= 0.3 fps Capacity= 28.77 cfs Outflow= 0.30 cfs 0.107 af

Reach R25: 24 to Dry Swale Inflow= 0.86 cfs 0.062 af
Length= 100.0' Max Vel= 0.4 fps Capacity= 7.62 cfs Outflow= 0.68 cfs 0.062 af

Reach R26: From 26 to SP Inflow= 0.10 cfs 0.009 af
Length= 180.0' Max Vel= 0.2 fps Capacity= 10.11 cfs Outflow= 0.06 cfs 0.009 af

Reach SP: Study Point Inflow= 4.07 cfs 0.680 af
Length= 100.0' Max Vel= 0.4 fps Capacity= 239.77 cfs Outflow= 3.97 cfs 0.679 af

Pond P11: Existing Satellite Lot Detention Pond Peak Storage= 917 cf Inflow= 0.89 cfs 0.065 af
Primary= 0.17 cfs 0.064 af Secondary= 0.00 cfs 0.000 af Outflow= 0.17 cfs 0.064 af

Pond P15: Pond 15 Peak Storage= 1,744 cf Inflow= 1.15 cfs 0.083 af
Primary= 0.03 cfs 0.034 af Secondary= 0.42 cfs 0.025 af Outflow= 0.45 cfs 0.059 af

Pond P16: Pond 16 Peak Storage= 595 cf Inflow= 0.42 cfs 0.029 af
Primary= 0.01 cfs 0.017 af Secondary= 0.10 cfs 0.006 af Outflow= 0.11 cfs 0.023 af

Pond P23: Pond 23 Peak Storage= 1,900 cf Inflow= 1.32 cfs 0.109 af
Primary= 0.30 cfs 0.107 af Secondary= 0.00 cfs 0.000 af Outflow= 0.30 cfs 0.107 af

Pond P24: Dry Swale Peak Storage= 1,055 cf Inflow= 1.14 cfs 0.106 af
Primary= 0.02 cfs 0.028 af Secondary= 1.09 cfs 0.065 af Outflow= 1.12 cfs 0.093 af

Runoff Area = 5.470 ac Volume = 0.728 af Average Depth = 1.60"

Subcatchment 11S: Satellite Parking

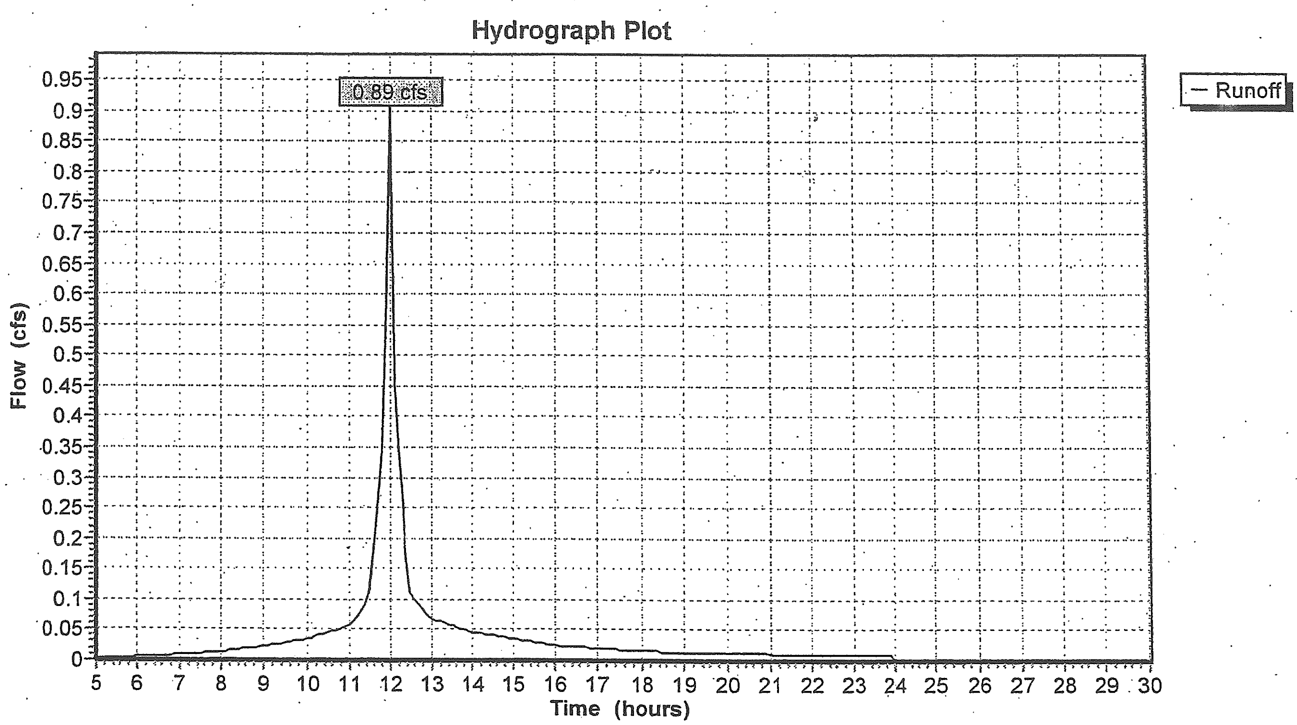
Runoff = 0.89 cfs @ 11.99 hrs, Volume= 0.065 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.270	98	IMPERVIOUS (PARKING LOT)
0.040	74	OPEN SPACE (GOOD)-HSG "C"
0.010	89	RIP RAP-HSG "C"
0.320	95	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0303	1.6		**Sheet Flow, Segment ID:AB** Smooth surfaces n= 0.011 P2= 3.00"
0.1	15	0.3300	4.0		**Shallow Concentrated Flow, Segment ID:BC** Kv= 7.0 fps
0.9	55	0.0200	1.0		**Shallow Concentrated Flow, Segment ID:CD** Short Grass Pasture Kv= 7.0 fps
2.1	170	Total			

Subcatchment 11S: Satellite Parking



Subcatchment 12S: North/West of Satellite

Runoff = 0.85 cfs @ 12.02 hrs, Volume= 0.065 af

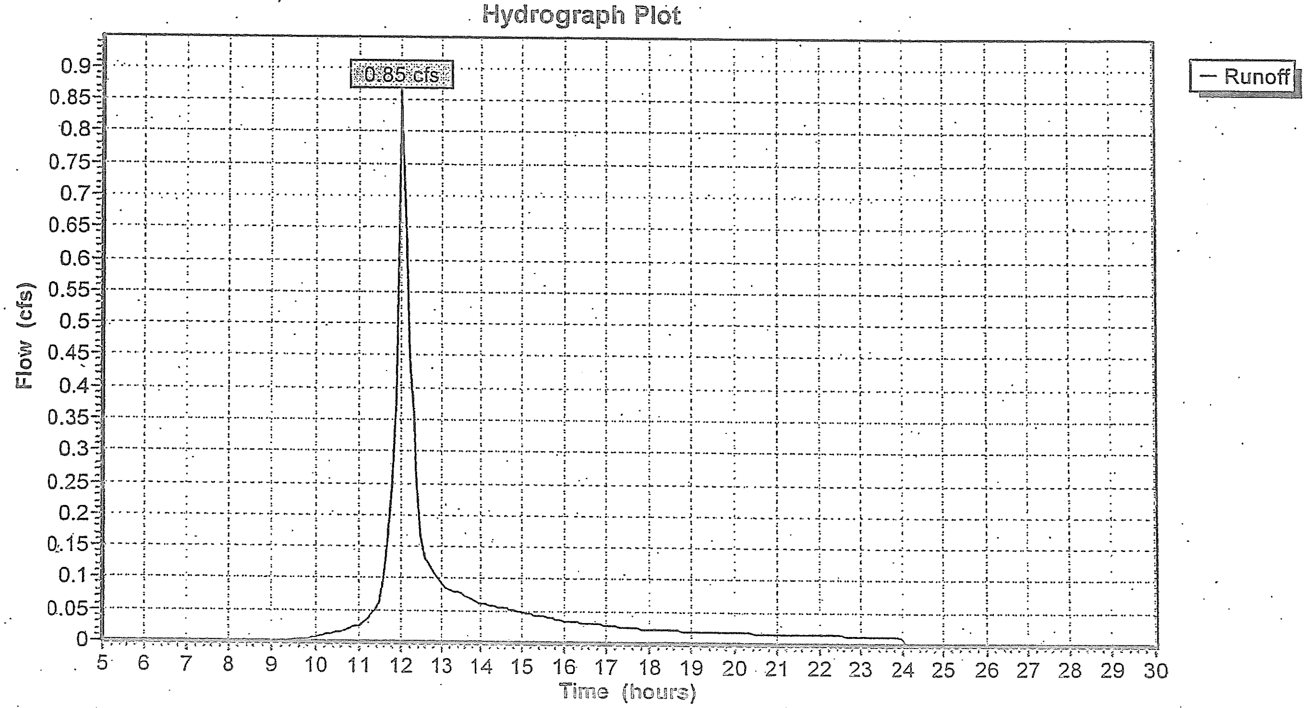
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.020	73	WOODS (FAIR)-HSG "C"
0.400	74	OPEN SPACE (GOOD)-HSG "C"
0.170	98	IMPERVIOUS
0.590	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	16	0.1900	0.2		**Sheet Flow, Segment ID:AB** Grass: Dense n= 0.240 P2= 3.00"
0.8	13	0.5000	0.3		**Sheet Flow, Segment ID:BC** Grass: Dense n= 0.240 P2= 3.00"
1.3	185	0.0270	2.5		**Shallow Concentrated Flow, Segment ID:CD** Grassed Waterway Kv= 15.0 fps
0.2	60	0.0100	5.7	7.00	**Circular Channel (pipe), SEGMENT ID:DE** Diam= 15.0" Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
1.1	165	0.0300	2.6		**Shallow Concentrated Flow, SEGMENT ID:EF** Grassed Waterway Kv= 15.0 fps
4.8	439	Total			

Subcatchment 12S: North/West of Satellite

Hydrograph Plot



Subcatchment 14S: Proposed Northeast

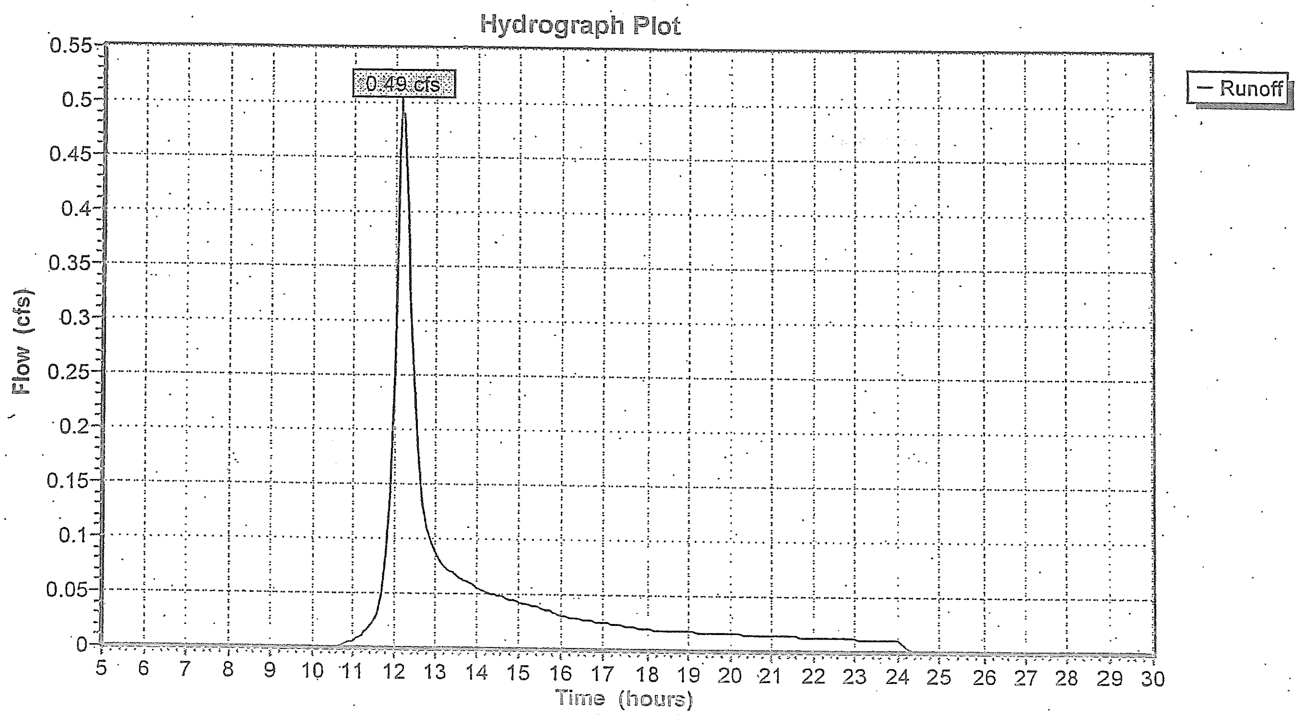
Runoff = 0.49 cfs @ 12.18 hrs, Volume= 0.050 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.240	73	Woods, Fair, HSG C
0.230	79	Woods, Fair, HSG D
0.120	74	>75% Grass cover, Good, HSG C
0.590	76	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	15	0.1333	0.2		**Sheet Flow, Segment AB** Grass: Short n= 0.150 P2= 3.00"
0.4	10	0.5000	0.4		**Sheet Flow, SegmentBC** Grass: Short n= 0.150 P2= 3.00"
3.9	45	0.3100	0.2		**Sheet Flow, Segment CD** Woods: Light underbrush n= 0.400 P2= 3.00"
6.9	30	0.0333	0.1		**Sheet Flow, DE** Woods: Light underbrush n= 0.400 P2= 3.00"
2.0	70	0.0140	0.6		**Shallow Concentrated Flow, SegmentDE** Woodland Kv= 5.0 fps
14.2	170	Total			

Subcatchment 14S: Proposed Northeast



Subcatchment 15S: Proposed Parking

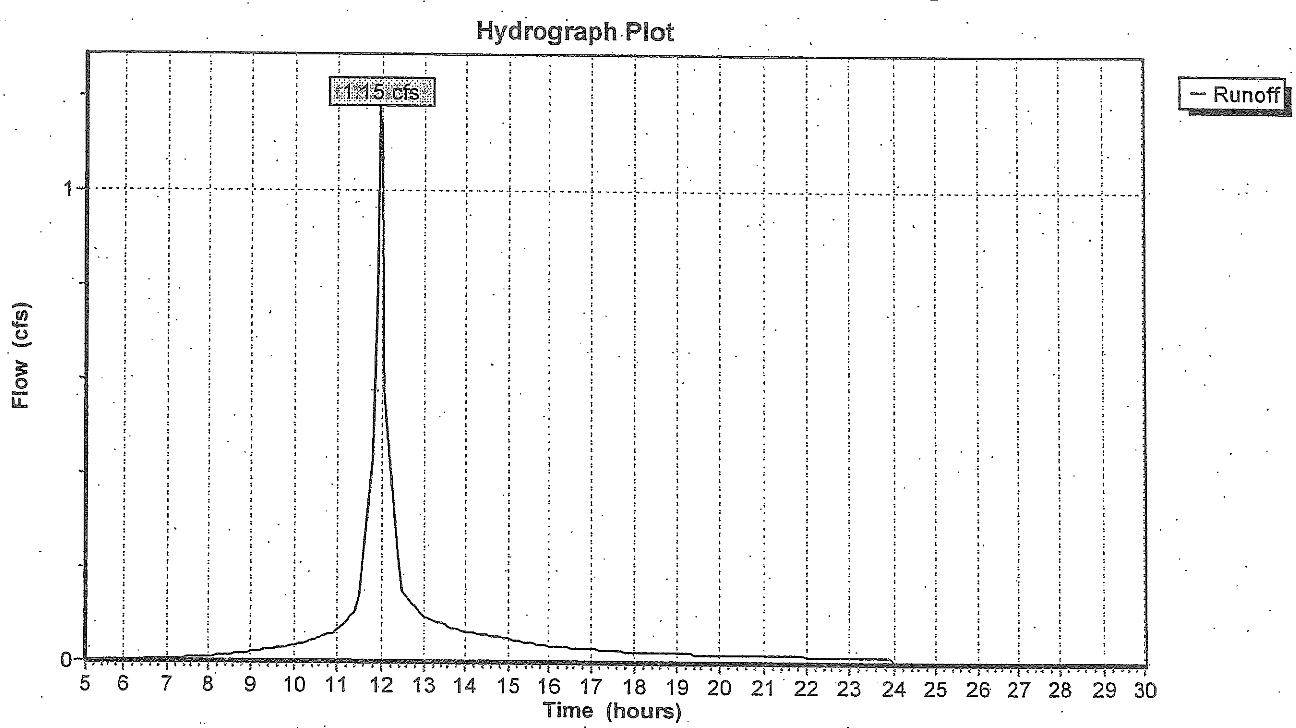
Runoff = 1.15 cfs @ 11.99 hrs, Volume= 0.083 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.340	98	Paved parking & roofs
0.140	74	>75% Grass cover, Good, HSG C
0.480	91	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0333	1.6		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.4	100	0.0333	3.7		**Shallow Concentrated Flow, BD** Paved Kv= 20.3 fps
1.4	200	Total			

Subcatchment 15S: Proposed Parking



Subcatchment 16S: Proposed Parking

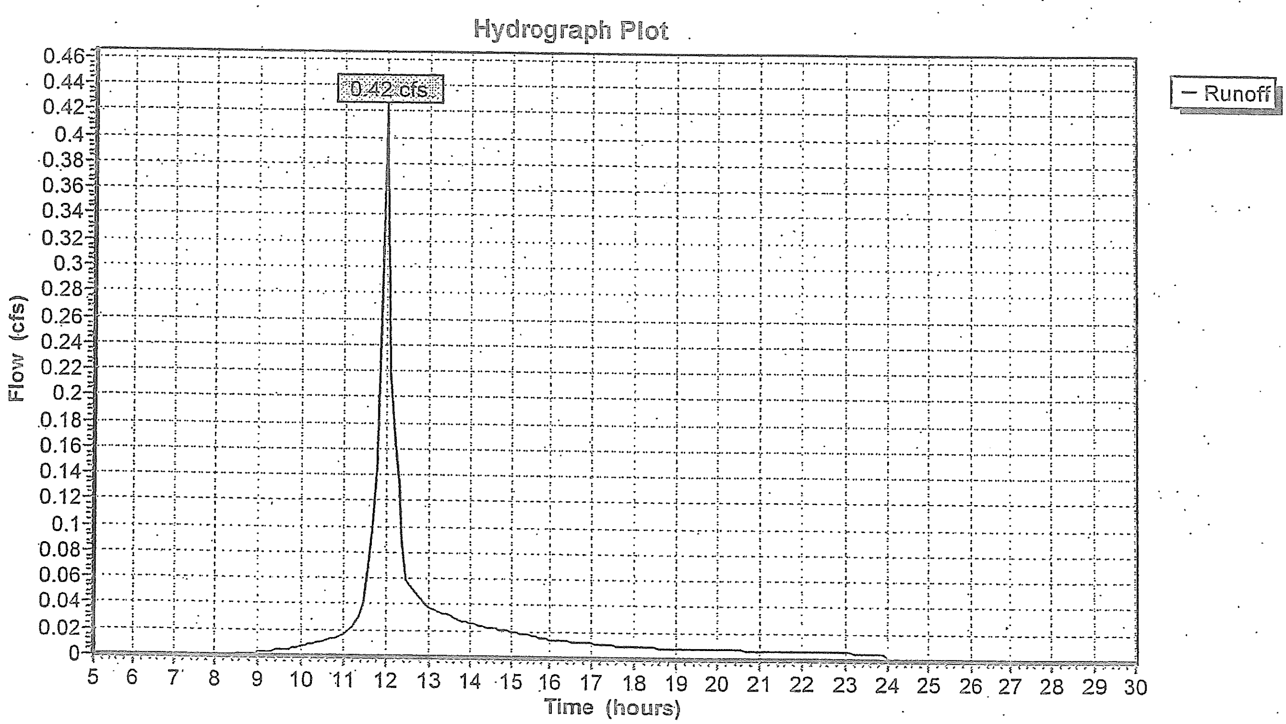
Runoff = 0.42 cfs @ 11.99 hrs, Volume= 0.029 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.100	98	Paved parking & roofs
0.120	74	>75% Grass cover, Good, HSG C
0.220	85	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	95	0.0333	1.6		Sheet Flow, Segment AB Smooth surfaces n= 0.011 P2= 3.00"
0.2	35	0.0300	3.5		Shallow Concentrated Flow, BC Paved Kv= 20.3 fps
0.3	50	0.1400	2.6		Shallow Concentrated Flow, Segment CD Short Grass Pasture Kv= 7.0 fps
1.5	180	Total			

Subcatchment 16S: Proposed Parking



Subcatchment 21S: Proposed Central

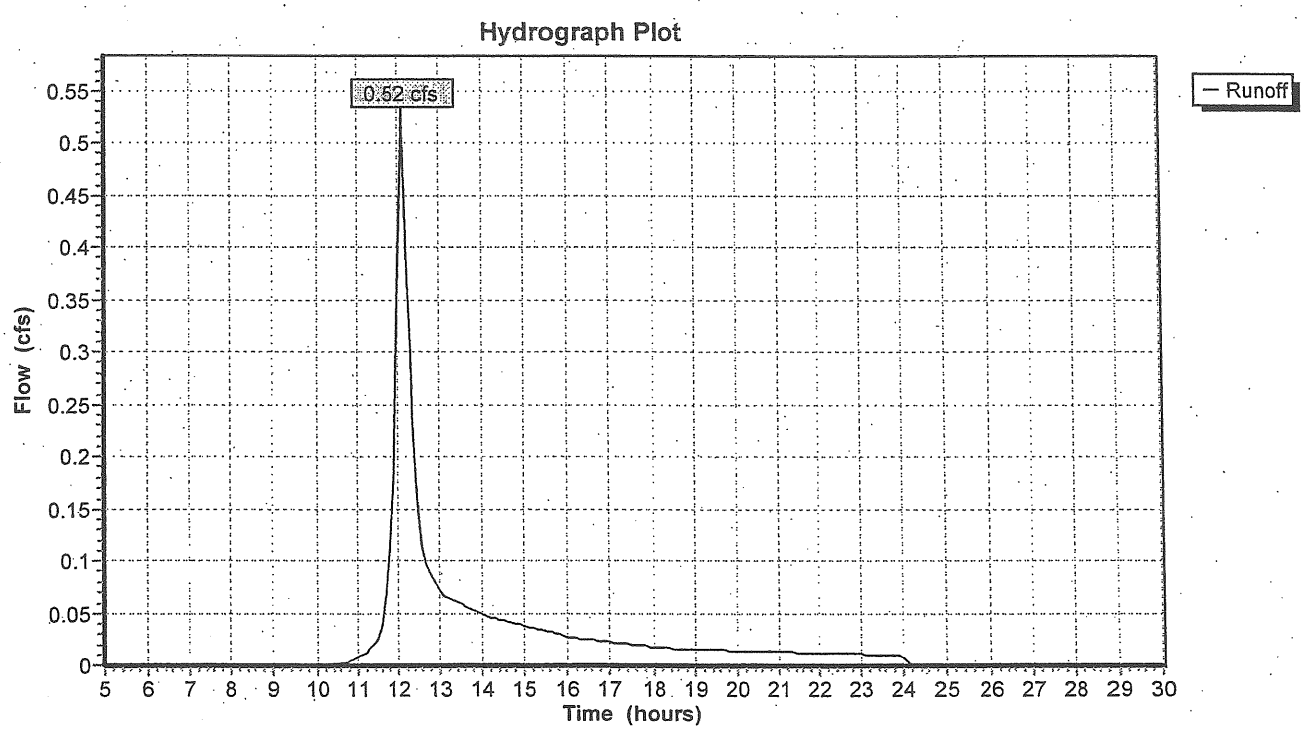
Runoff = 0.52 cfs @ 12.10 hrs, Volume= 0.045 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.180	73	WOODS (FAIR)-HSG "C"
0.150	74	OPEN SPACE (GOODG "C"
0.200	79	WOODS (FAIR)-HSD "D"
0.530	76	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	60	0.0417	0.2		**Sheet Flow, SegmentAB** Grass: Short n= 0.150 P2= 3.00"
2.2	40	0.1500	0.3		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
0.2	30	0.2700	2.6		**Shallow Concentrated Flow, Segment ID:CD** Woodland Kv= 5.0 fps
1.2	80	0.0500	1.1		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
8.6	210	Total			

Subcatchment 21S: Proposed Central



Subcatchment 22S: Existing Parking and Entrance Circle

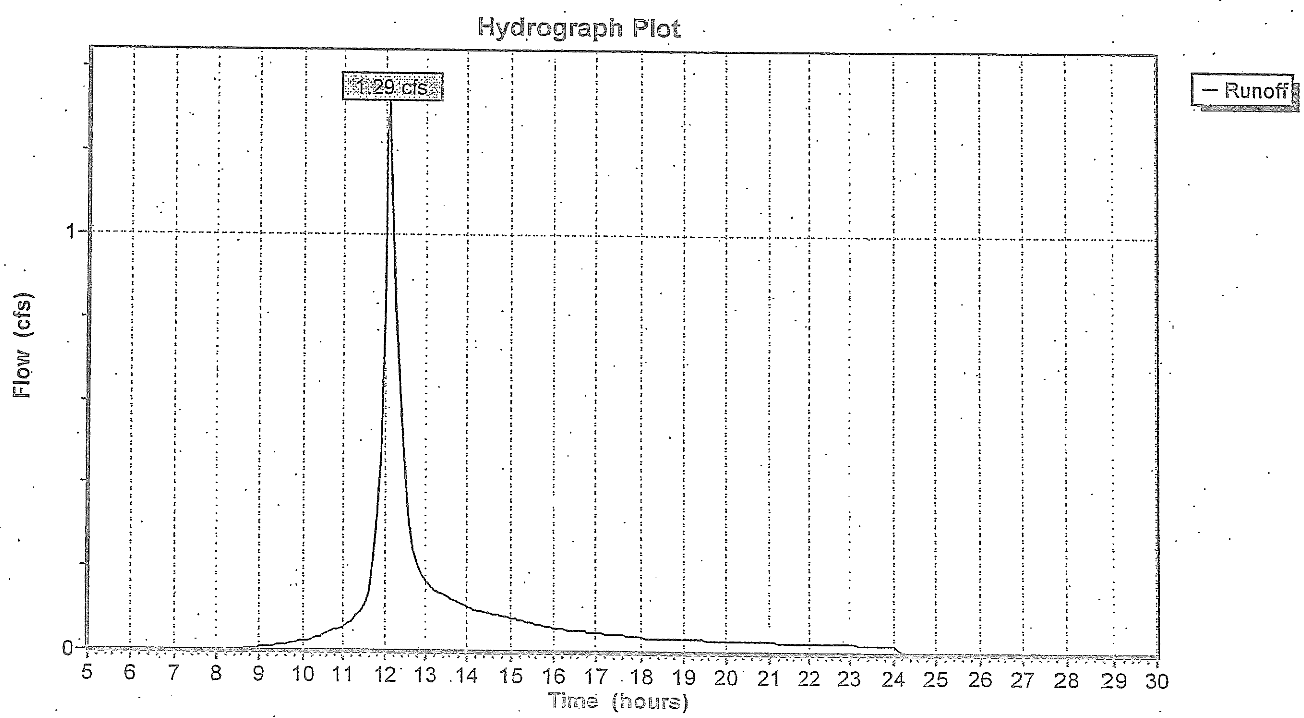
Runoff = 1.29 cfs @ 12.12 hrs, Volume= 0.114 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.070	73	WOODS (FAIR)-HSG "C"
0.400	74	OPEN SPACE (GOODG "C"
0.390	98	IMPERVIOUS (BLDG, PAVEMENT)
0.860	85	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0167	0.1		**Sheet Flow, Segment ID:AB** Grass: Short n= 0.150 P2= 3.00"
0.4	20	0.0125	0.8		**Sheet Flow, SegmentBC** Smooth surfaces n= 0.011 P2= 3.00"
7.9	65	0.1100	0.1		**Sheet Flow, SegmentCD** Woods: Light underbrush n= 0.400 P2= 3.00"
0.8	75	0.0880	1.5		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
0.3	180	0.0330	9.7	7.65	**Circular Channel (pipe), SegmentEF** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011
11.8	355	Total			

Subcatchment 22S: Existing Parking and Entrance Circle



Subcatchment 23S: Proposed Buildings

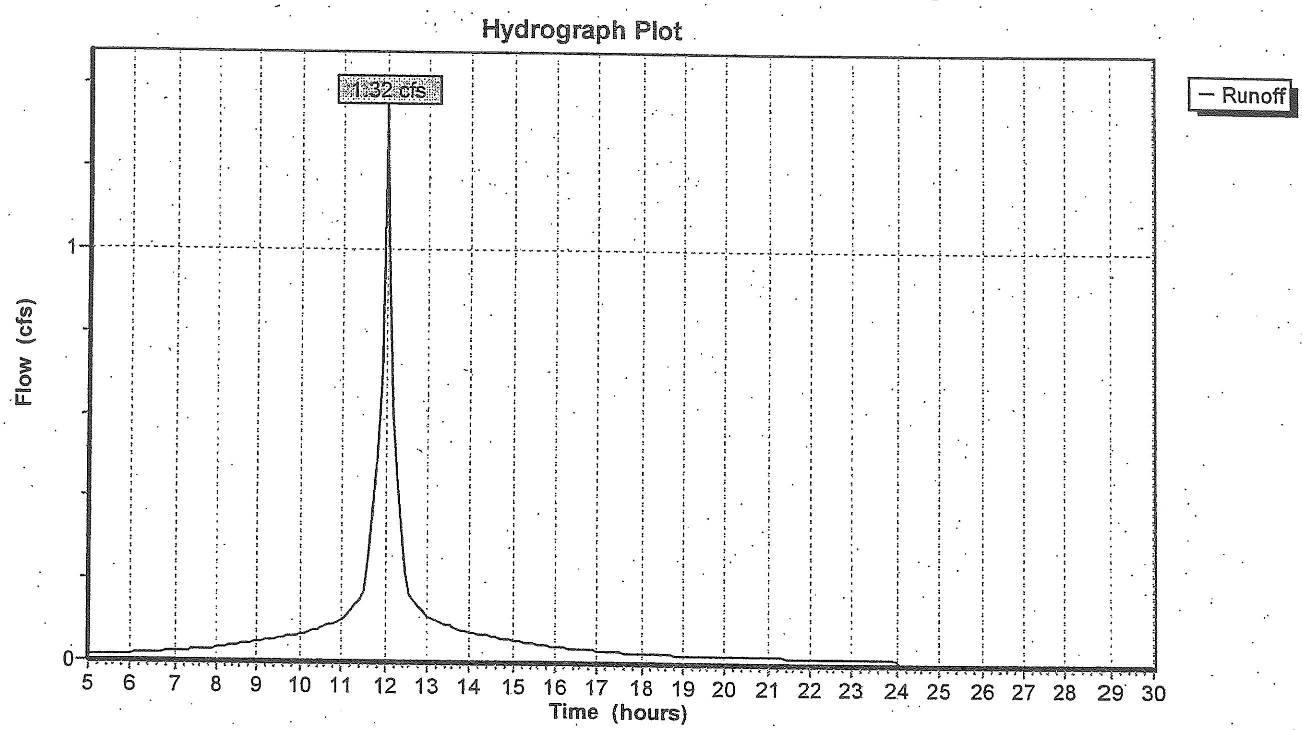
Runoff = 1.32 cfs @ 12.02 hrs, Volume= 0.109 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.480	98	Paved parking & roofs

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

Subcatchment 23S: Proposed Buildings



Subcatchment 24S: Expanded Parking

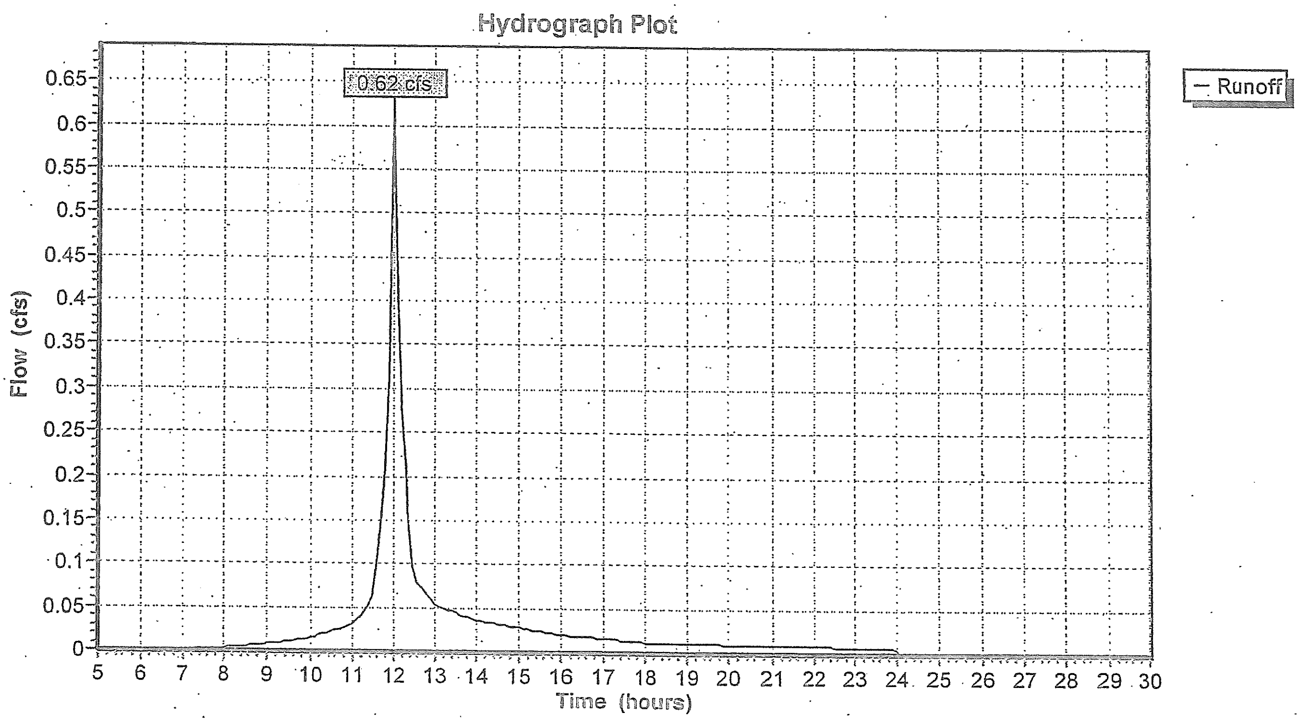
Runoff = 0.62 cfs @ 12.01 hrs, Volume= 0.044 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.170	98	Paved parking & roofs
0.110	74	>75% Grass cover, Good, HSG C
0.280	89	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	10	0.0100	0.1		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.00"
0.6	10	0.2000	0.3		Sheet Flow, BC Grass: Short n= 0.150 P2= 3.00"
0.7	80	0.0600	2.0		Sheet Flow, CD Smooth surfaces n= 0.011 P2= 3.00"
0.4	100	0.0400	4.1		Shallow Concentrated Flow, DE Paved Kv= 20.3 fps
3.8	200	Total			

Subcatchment 24S: Expanded Parking



Subcatchment 25S: Access & Rear Parking

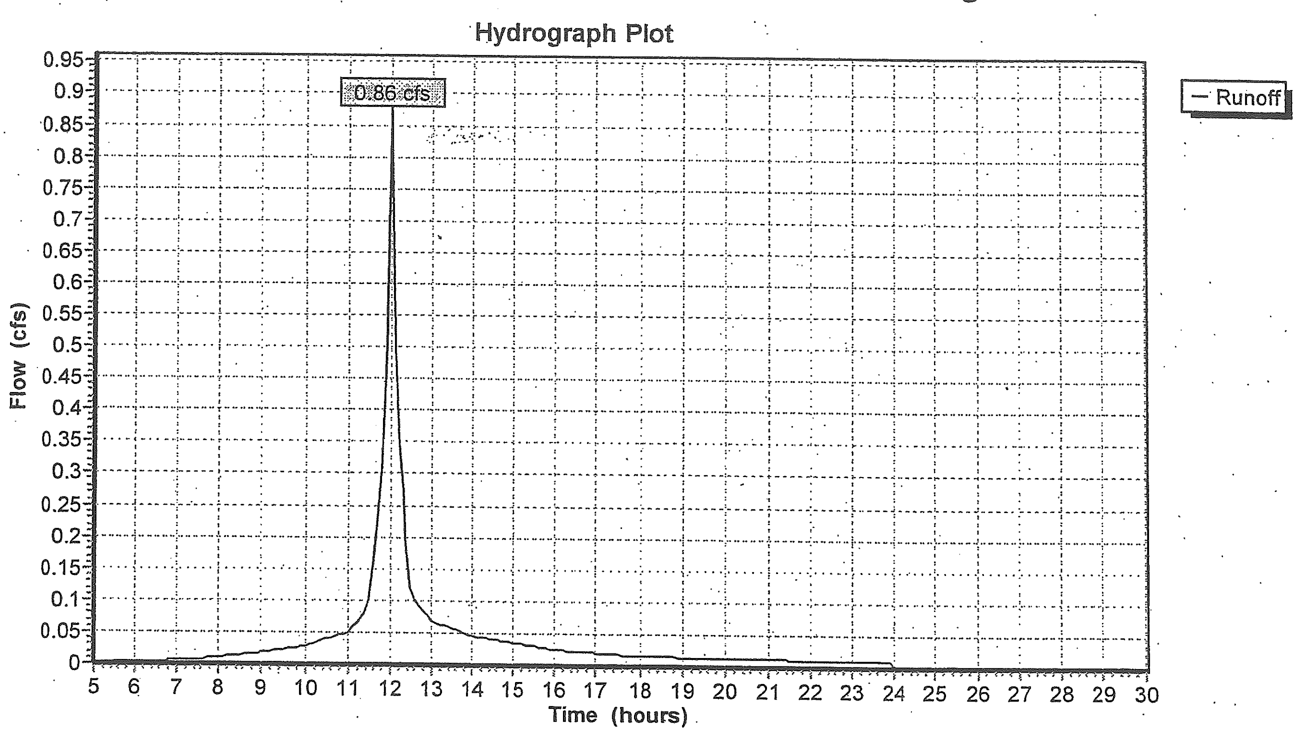
Runoff = 0.86 cfs @ 12.00 hrs, Volume= 0.062 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.260	98	Paved parking & roofs
0.070	74	>75% Grass cover, Good, HSG C
0.330	93	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	15	0.0333	0.1		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.00"
0.8	85	0.0400	1.7		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.00"
0.6	110	0.0250	3.2		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
3.2	210	Total			

Subcatchment 25S: Access & Rear Parking



Subcatchment 26S: Rear of Building

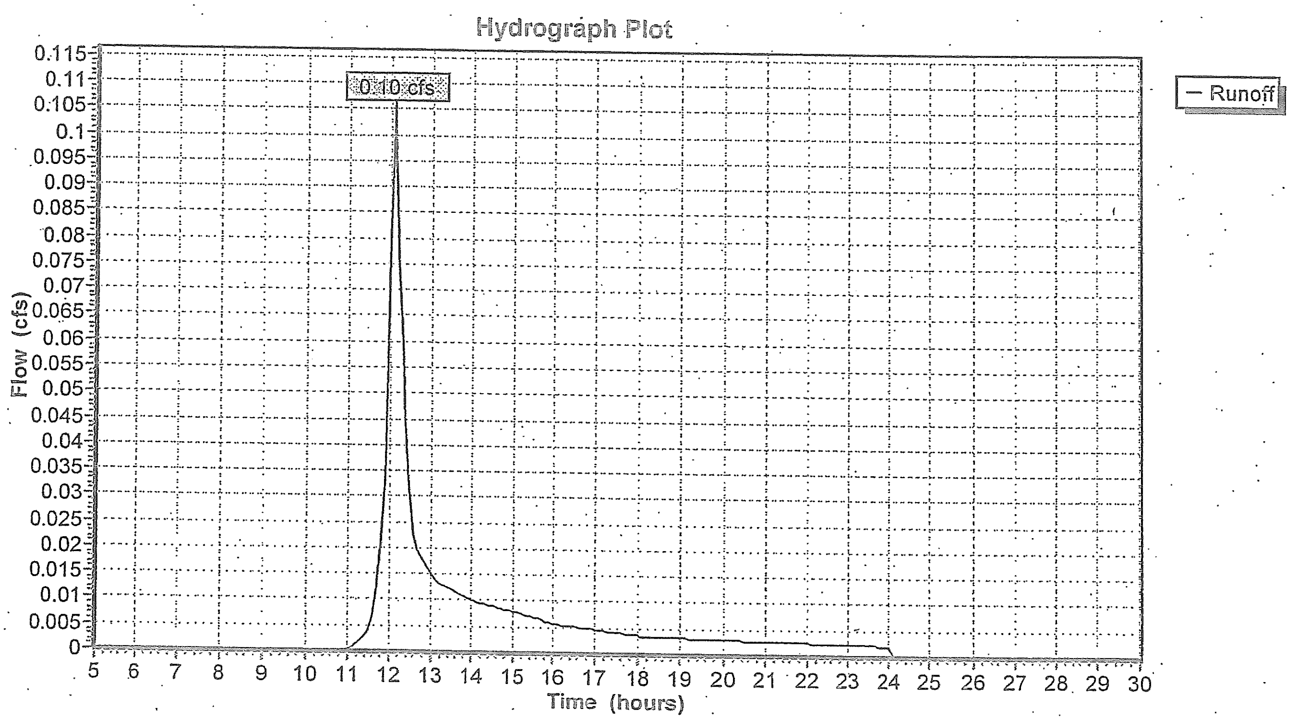
Runoff = 0.10 cfs @ 12.10 hrs, Volume= 0.009 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.120	74	>75% Grass cover, Good, HSG C

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	10	0.2000	0.3		**Sheet Flow, Segment AB** Grass: Short n= 0.150 P2= 3.00"
6.4	90	0.0500	0.2		**Sheet Flow, Segment BC** Grass: Short n= 0.150 P2= 3.00"
0.8	100	0.0900	2.1		**Shallow Concentrated Flow, Segment CD** Short Grass Pasture Kv= 7.0 fps
7.8	200	Total			

Subcatchment 26S: Rear of Building



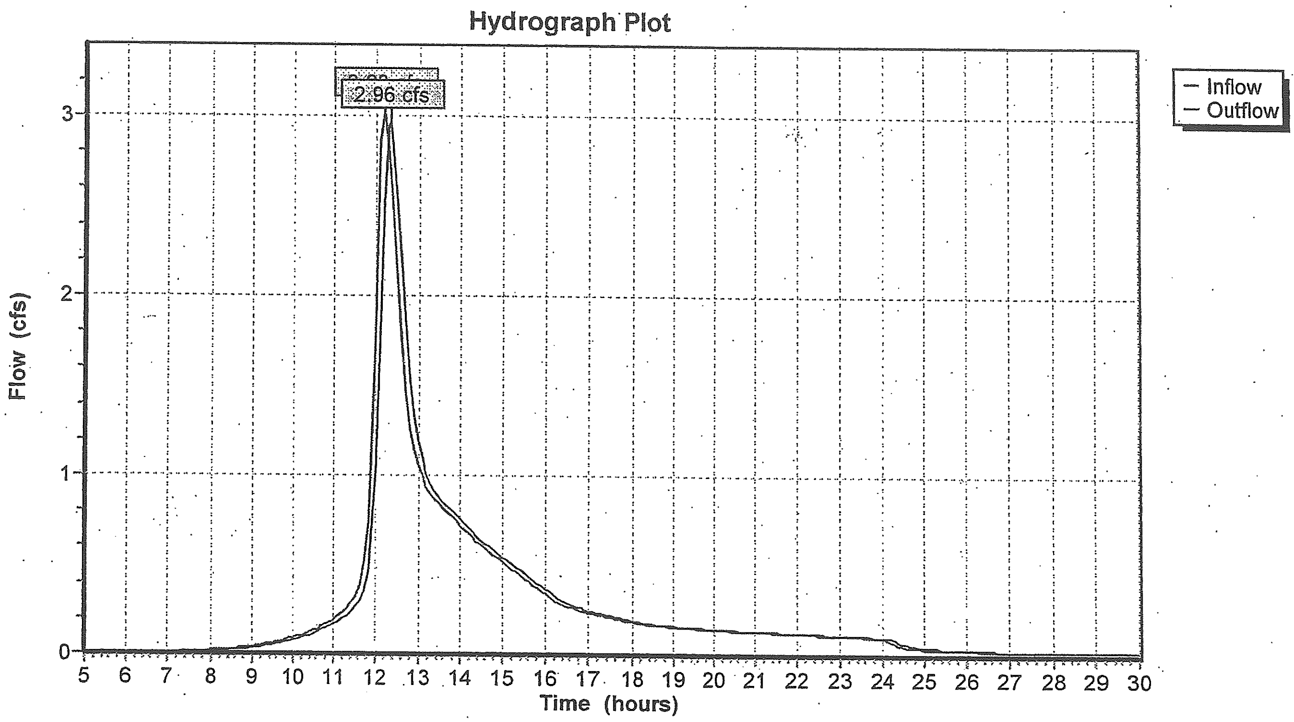
Reach 1R: Existing Swale

Inflow	=	3.03 cfs @	12.19 hrs, Volume=	0.506 af
Outflow	=	2.96 cfs @	12.33 hrs, Volume=	0.505 af, Atten= 2%, Lag= 8.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.8 fps, Min. Travel Time= 4.2 min
Avg. Velocity = 0.3 fps, Avg. Travel Time= 13.0 min

Peak Depth= 0.46'
Capacity at bank full= 43.53 cfs
Inlet Invert= 30.00', Outlet Invert= 29.50'
7.00' x 2.00' deep channel, n= 0.050 Length= 200.0' Slope= 0.0025 '/'
Side Slope Z-value= 3.0 2.0 '/'

Reach 1R: Existing Swale



Reach 2R: Existing Swale

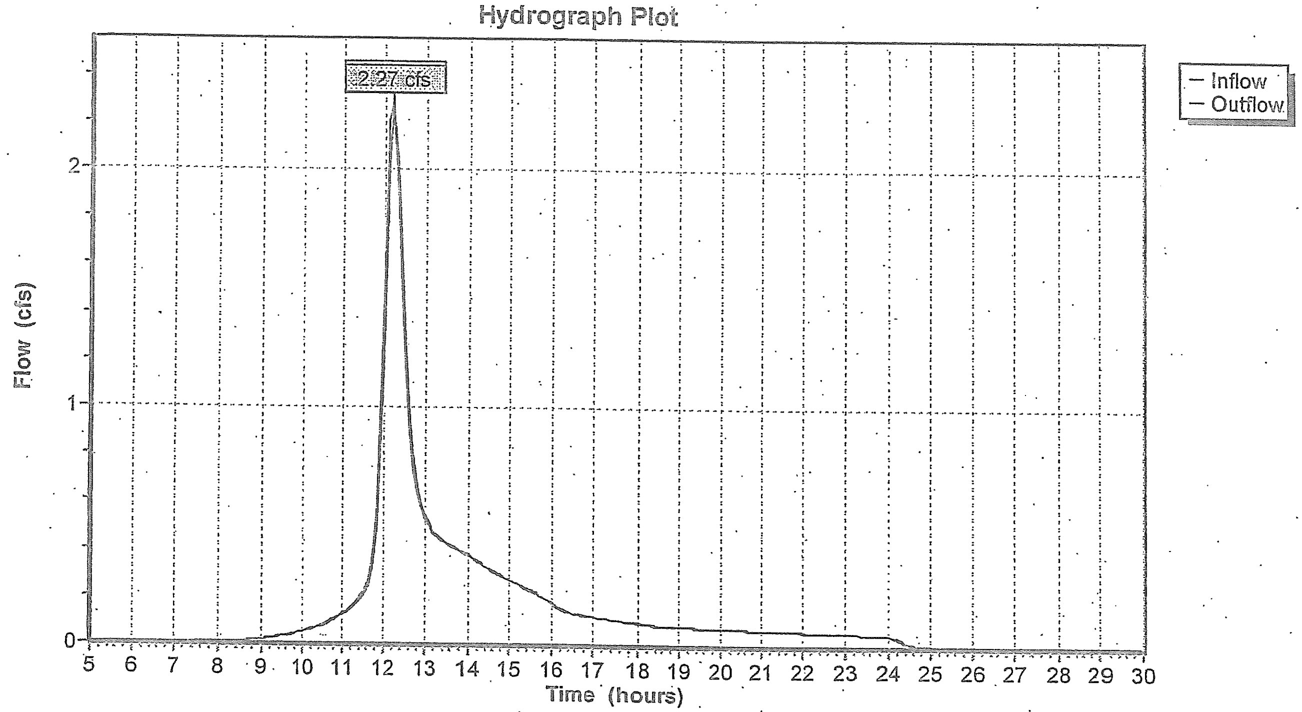
Inflow	=	2.28 cfs @ 12.17 hrs, Volume=	0.288 af	
Outflow	=	2.27 cfs @ 12.20 hrs, Volume=	0.288 af,	Atten= 1%, Lag= 2.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.3 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 0.4 fps, Avg. Travel Time= 3.2 min

Peak Depth= 0.32'
Capacity at bank full= 144.69 cfs
Inlet Invert= 30.80', Outlet Invert= 30.00'
5.00' x 3.00' deep channel, n= 0.050 Length= 80.0' Slope= 0.0100 '/'
Side Slope Z-value= 2.0 '/'

Reach 2R: Existing Swale

Hydrograph Plot



the intersection. However, the building next door will continue to accommodate 32 employees but employed by another party and the assessment should be based on the new traffic generation associated with the Woodard & Curran site.

Gorrill-Palmer resubmitted the analysis on 3.2. 2006 (Attachment IV E- b) using the higher figure (96) for the number of additional employees. Tom Errico reviewed the second submission and comments:

" I have reviewed the updated traffic analysis prepared by Gorrill-Palmer Consulting Engineers, Inc. and the results indicate movements at the intersection are projected to operate at unacceptable levels of service. I will be communicating this issue with Gorrill-Palmer and will ask them to identify possible strategies for mitigating the deficiencies. Following identification of the improvement strategy, I will determine a cost sharing contribution that the applicant would be expected to contribute."

Parking

The Report included an analysis of the parking when the proposed total parking was 167 spaces. The revised total is 164 spaces, a reduction of 3 spaces (Attachment IV A, page 8). This revised parking provision meets the zoning requirement of 142 spaces and meets the minimum level quoted by Tom Errico in the Report (based on the Institute of Transportation Engineers) of 164 parking spaces.

The applicants had previously submitted evidence (explained in the Report) showing that the placement of additional parking in the southern part of the site would have undesirable consequences. They reconsidered this possibility (see updated analysis in Attachment IV A a) and the main revision to the proposals is the removal of 11 parking spaces from the proposed parking lot at the rear of the proposed addition (nearest to the brook/wetlands) and the creation of 8 new parking spaces along the access road into the existing parking lot adjacent to the South Block (Attachment IV Ie, Proposed Site Plan).

Sewers, Stormdrains, Water, Solid Waste Disporsal

Sewers

The applicant has received a letter dated 2.24.2006 from the Portland Public Works Department confirming capacity to transport and to treat anticipated wastewater flows (Attachment IV B a).

Stormdrains

The applicant has addressed the previous comments to the satisfaction of the DRC (Jim Seymour of Sebago Technics) and the DRC review of the revised proposals is included in Attachment IV D. He confirms that the project design is in conformance for both stormwater quantity and quality control as supported by the stormwater narrative and calculations dated 2.22.06 (Attachment IV A b).

The MDEP have requested inclusion of inspection and maintenance procedures for the subsurface detention structure and the vegetated swale that was added to convey runoff from the access drive to the dry swale at the NE corner of the proposed rear parking lot; an Addendum to the Stormwater Management narrative was submitted on 2.28.2006 (Attachment IV B b) and this is referenced in a suggested condition.

Landscaping and Existing Vegetation

A revised landscaping plan has been submitted (Attachment IV I k) to provide planting in the vicinity of the relocated parking and along the internal access road as reinstatement for losses during construction. Cape cod curbing has been placed around the islands in the parking lot to protect planted areas. Jeff Tarling, the City Arborist, has reviewed the revised Landscape Plan (Attachment IV G) and finds it acceptable, but questions whether a more 'green' landscape treatment can be incorporated for the main entrance turning circle, which is shown as concrete pavers on the Proposed Site Plan.

Wetlands

The applicant entered into discussions with the MDEP following their submission to the MDEP in January of a Wetlands Alteration Permit and application for a Minor Amendment to the Site Location of Development Permit for Stroudwater Estates Phase II.

Both the city and the MDEP had requested the applicant to consider alternatives that would reduce the impact on the brooks and wetlands on the site, particularly alternatives that located more of the proposed development to the south of the site.

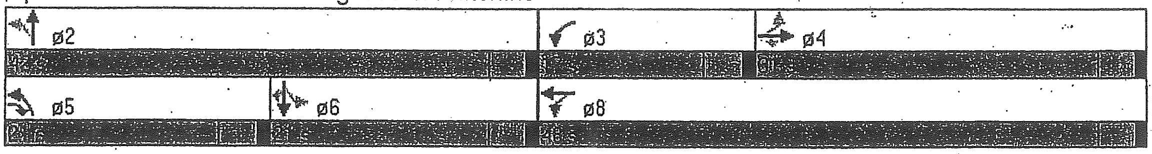
The recent revision relocates 8 parking spaces from the proposed parking area to the rear of the addition to the access road at the south edge of the site. This allows for the parking that is nearest the brook and wetlands to be about 60 feet from the unnamed brook (the larger of the two brooks on the site) rather than 35-40 feet as in the previous proposal. The parking area hugs the 25 foot setback line for the smaller wetland/brook area to the east of the site. A plan showing the contours for the 25 foot and 75 foot setbacks for both brooks and the wetlands is included at (Attachment IV I p.), as requested by Planning.

In addition the applicant has minimized the impact of the development on the brook by the use of filtration basins and a dry swale to achieve treatment of stormwater runoff. The City's DRC has confirmed these are acceptable (Attachment IV D) and it is understood that the MDEP believe the project can be approved (Attachment IV E a.).

Overall the setbacks to the brook and wetlands have been increased and the combination of stormwater treatment and high levels of maintenance are anticipated to minimize adverse impacts. However, the internal access road remains 35-40 feet from the brook and 7 feet from the wetland at the closest points and the scale of the development within a relatively sensitive site remains a concern. If the Planning Board is minded to grant approval, Staff suggest the approval be conditioned to limit further expansion or development of parking areas or commercial space.

Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Congress & Hutchins

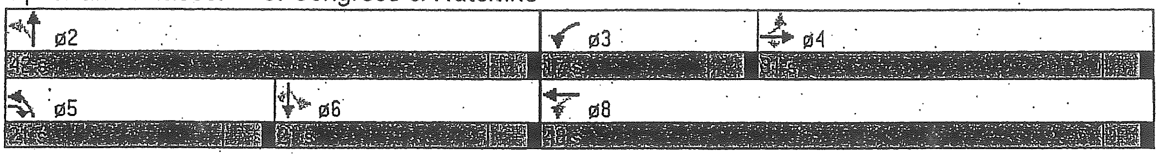


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1752	1845	1568	1770	1853	0	1671	1652	0	0	2094	1599
Flt Permitted	0.148			0.204			0.256				0.847	
Satd. Flow (perm)	273	1845	1568	380	1853	0	450	1652	0	0	1806	1599
Satd. Flow (RTOR)			288		3			30				77
Volume (vph)	25	385	628	270	765	28	361	41	28	87	150	93
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	8%	8%	8%	1%	1%	1%
Lane Group Flow (vph)	27	414	675	290	853	0	388	74	0	0	255	100
Turn Type	Perm		pm+ov	pm+pt			pm+pt			Perm		Perm
Protected Phases		4	5	3	8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phases	4	4	5	3	8		5	2		6	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	8.0	20.0		8.0	20.0		20.0	20.0	20.0
Total Split (s)	31.0	31.0	21.0	17.0	48.0	0.0	21.0	42.0	0.0	21.0	21.0	21.0
Total Split (%)	34.4%	34.4%	23.3%	18.9%	53.3%	0.0%	23.3%	46.7%	0.0%	23.3%	23.3%	23.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lead	Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes			Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	Min		Min	Min	Min
Act Effct Green (s)	24.9	24.9	46.2	41.1	41.1		36.4	36.4			15.2	15.2
Actuated g/C Ratio	0.29	0.29	0.54	0.48	0.48		0.43	0.43			0.18	0.18
v/c Ratio	0.34	0.77	0.69	0.76	0.96		0.89	0.10			0.80	0.29
Control Delay	38.4	39.1	12.5	29.0	44.2		45.0	10.9			53.8	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	38.4	39.1	12.5	29.0	44.2		45.0	10.9			53.8	13.8
LOS	D	D	B	C	D		D	B			D	B
Approach Delay		23.0			40.3			39.6			42.5	
Approach LOS		C			D			D			D	
Queue Length 50th (ft)	12	212	149	96	438		162	14			138	11
Queue Length 95th (ft)	39	#329	282	#190	#705		#324	40			#249	53
Internal Link Dist (ft)		1942			2113			1998			1904	
Turn Bay Length (ft)	75		120	300			200					75
Base Capacity (vph)	85	571	978	392	925		436	739			353	374
Starvation Cap Reductn	0	0	0	0	0		0	0			0	0
Spillback Cap Reductn	0	0	0	0	0		0	0			0	0
Storage Cap Reductn	0	0	0	0	0		0	0			0	0
Reduced v/c Ratio	0.32	0.73	0.69	0.74	0.92		0.89	0.10			0.72	0.27

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 85.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 34.2 Intersection LOS: C
Intersection Capacity Utilization 91.3% ICU Level of Service F

Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Congress & Hutchins



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↑↱			↰↑	↱
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1752	1845	1568	1770	1853	0	1671	1647	0	0	2094	1599
Flt Permitted	0.148			0.204			0.330				0.856	
Satd. Flow (perm)	273	1845	1568	380	1853	0	581	1647	0	0	1825	1599
Satd. Flow (RTOR)			326		3			80				77
Volume (vph)	23	385	628	270	765	25	361	37	28	73	127	78
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	8%	8%	8%	1%	1%	1%
Lane Group Flow (vph)	25	414	675	290	850	0	388	70	0	0	215	84
Turn Type	Perm		pm+ov	pm+pt			pm+pt			Perm		Perm
Protected Phases		4	5	3	8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phases	4	4	5	3	8		5	2		6	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	8.0	20.0		8.0	20.0		20.0	20.0	20.0
Total Split (s)	31.0	31.0	21.0	17.0	48.0	0.0	21.0	42.0	0.0	21.0	21.0	21.0
Total Split (%)	34.4%	34.4%	23.3%	18.9%	53.3%	0.0%	23.3%	46.7%	0.0%	23.3%	23.3%	23.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lead	Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes			Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	Min		Min	Min	Min
Act Effct Green (s)	24.4	24.4	45.3	40.5	40.5		34.8	34.8			13.8	13.8
Actuated g/C Ratio	0.29	0.29	0.54	0.49	0.49		0.42	0.42			0.17	0.17
v/c Ratio	0.31	0.77	0.67	0.76	0.94		0.84	0.10			0.71	0.25
Control Delay	36.7	38.3	11.0	28.0	41.3		38.0	10.7			47.4	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	36.7	38.3	11.0	28.0	41.3		38.0	10.7			47.4	11.3
LOS	D	D	B	C	D		D	B			D	B
Approach Delay		21.7			37.9			33.9			37.2	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	11	206	123	93	419		162	13			113	3
Queue Length 95th (ft)	37	#329	258	#190	#701		#284	38			188	41
Internal Link Dist (ft)		1942			2113			1998			1904	
Turn Bay Length (ft)	75		120	300			200					75
Base Capacity (vph)	86	584	989	399	944		466	743			362	379
Starvation Cap Reductn	0	0	0	10	0		0	0			0	0
Spillback Cap Reductn	0	0	0	0	0		0	0			0	0
Storage Cap Reductn	0	0	0	0	0		0	0			0	0
Reduced v/c Ratio	0.29	0.71	0.68	0.73	0.90		0.83	0.09			0.59	0.22

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 83.4

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 31.2 — Intersection LOS: C

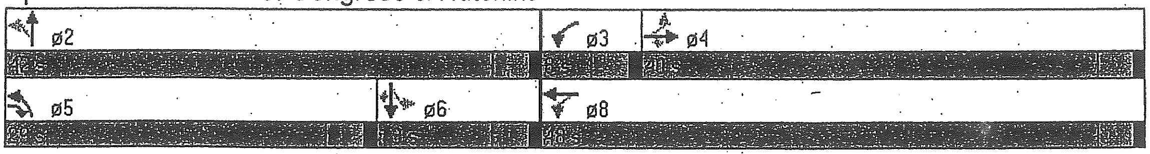
Intersection Capacity Utilization 89.2% — ICU Level of Service E

Analysis Period (min) 15

\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: Congress & Hutchins

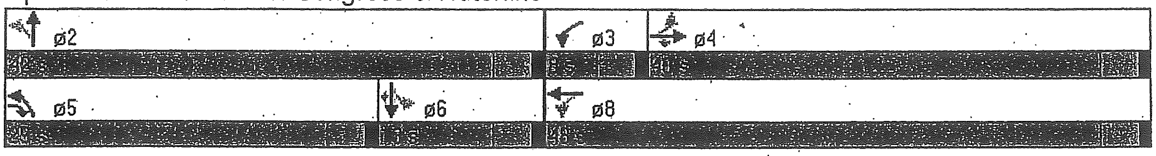


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↑↱			↰↑	↱
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1736	1827	1553	1719	1768	0	1736	1655	0	0	1797	1369
Flt Permitted	0.430			0.100			0.489				0.753	
Satd. Flow (perm)	786	1827	1553	181	1768	0	893	1655	0	0	1374	1369
Satd. Flow (RTOR)			293		14			117				31
Volume (vph)	89	666	278	26	382	69	560	163	276	23	51	29
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	4%	4%	4%	18%	18%	18%
Lane Group Flow (vph)	94	701	293	27	475	0	589	463	0	0	78	31
Turn Type	Perm		pm+ov	pm+pt			pm+pt			Perm		Perm
Protected Phases		4	5	3	8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phases	4	4	5	3	8		5	2		6	6	6
Minimum Initial (s)	4.0	4.0	4.0	3.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	8.0	20.0		8.0	20.0		10.0	10.0	10.0
Total Split (s)	40.0	40.0	29.0	8.0	48.0	0.0	29.0	42.0	0.0	13.0	13.0	13.0
Total Split (%)	44.4%	44.4%	32.2%	8.9%	53.3%	0.0%	32.2%	46.7%	0.0%	14.4%	14.4%	14.4%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lead	Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes			Yes	Yes	Yes
Recall Mode	Min	Min	Min	None	Min		Min	None		None	None	None
Act Effct Green (s)	33.2	33.2	63.4	35.9	36.0		34.1	34.1			8.2	8.2
Actuated g/C Ratio	0.42	0.42	0.81	0.43	0.46		0.43	0.43			0.10	0.10
v/c Ratio	0.28	0.91	0.22	0.18	0.58		0.90	0.59			0.56	0.19
Control Delay	20.3	41.0	0.9	15.7	19.0		40.8	16.8			54.0	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	20.3	41.0	0.9	15.7	19.0		40.8	16.8			54.0	16.5
LOS	C	D	A	B	B		D	B			D	B
Approach Delay		28.4			18.9			30.2			43.3	
Approach LOS		C			B			C			D	
Queue Length 50th (ft)	30	316	0	8	174		235	120			39	0
Queue Length 95th (ft)	76	#613	19	21	267		#459	248			#101	27
Internal Link Dist (ft)		1942			2113			1998			1904	
Turn Bay Length (ft)	75		120	300								75
Base Capacity (vph)	353	821	1267	154	917		673	836			155	182
Starvation Cap Reductn	0	0	0	0	0		0	0			0	0
Spillback Cap Reductn	0	0	0	0	0		0	0			0	0
Storage Cap Reductn	0	0	0	0	0		0	0			0	0
Reduced v/c Ratio	0.27	0.85	0.23	0.18	0.52		0.88	0.55			0.50	0.17

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 78.5
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 28.0 Intersection LOS: C
Intersection Capacity Utilization 86.1% ICU Level of Service E

Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

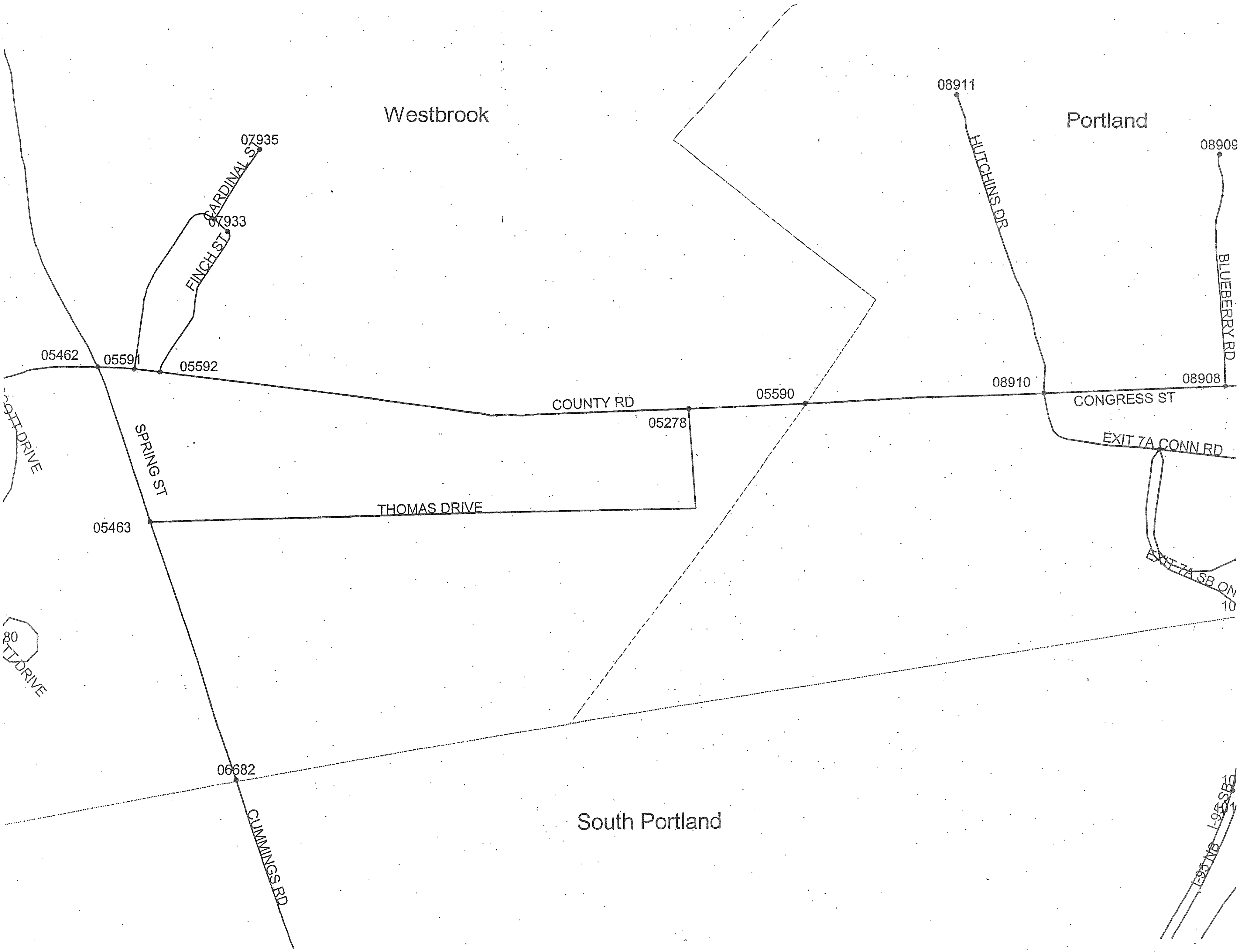
Splits and Phases: 3: Congress & Hutchins



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1736	1827	1553	1719	1772	0	1736	1644	0	0	1797	1369
Flt Permitted	0.438			0.100			0.491				0.762	
Satd. Flow (perm)	800	1827	1553	181	1772	0	897	1644	0	0	1391	1369
Satd. Flow (RTOR)			293		13			139				29
Volume (vph)	77	666	278	26	382	62	560	138	276	22	48	28
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	4%	4%	4%	18%	18%	18%
Lane Group Flow (vph)	81	701	293	27	467	0	589	436	0	0	74	29
Turn Type	Perm		pm+ov	pm+pt			pm+pt			Perm		Perm
Protected Phases		4	5	3	8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phases	4	4	5	3	8		5	2		6	6	6
Minimum Initial (s)	4.0	4.0	4.0	3.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	8.0	20.0		8.0	20.0		10.0	10.0	10.0
Total Split (s)	40.0	40.0	29.0	8.0	48.0	0.0	29.0	42.0	0.0	13.0	13.0	13.0
Total Split (%)	44.4%	44.4%	32.2%	8.9%	53.3%	0.0%	32.2%	46.7%	0.0%	14.4%	14.4%	14.4%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lead	Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes			Yes	Yes	Yes
Recall Mode	Min	Min	Min	None	Min		Min	None		None	None	None
Act Effct Green (s)	33.2	33.2	63.3	35.8	36.0		33.9	33.9			8.1	8.1
Actuated g/C Ratio	0.42	0.42	0.81	0.43	0.46		0.43	0.43			0.10	0.10
v/c Ratio	0.24	0.91	0.22	0.17	0.57		0.90	0.55			0.53	0.18
Control Delay	19.3	40.7	0.9	15.7	18.8		41.0	14.8			51.9	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	19.3	40.7	0.9	15.7	18.8		41.0	14.8			51.9	17.0
LOS	B	D	A	B	B		D	B			D	B
Approach Delay		28.3			18.6			29.9			42.1	
Approach LOS		C			B			C			D	
Queue Length 50th (ft)	25	316	0	8	171		235	99			36	0
Queue Length 95th (ft)	66	#613	19	21	261		#458	215			#93	26
Internal Link Dist (ft)		1942			2113			1998			1904	
Turn Bay Length (ft)	75		120	300								75
Base Capacity (vph)	360	823	1266	155	920		673	842			158	181
Starvation Cap Reductn	0	0	0	0	0		0	0			0	0
Spillback Cap Reductn	0	0	0	0	0		0	0			0	0
Storage Cap Reductn	0	0	0	0	0		0	0			0	0
Reduced v/c Ratio	0.23	0.85	0.23	0.17	0.51		0.88	0.52			0.47	0.16

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 78.3
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 27.6 Intersection LOS: C
Intersection Capacity Utilization 86.1% ICU Level of Service E



Westbrook
Portland
South Portland
07935
CARDINAL ST
07933
FINCH ST
08911
HUTCHINS DR
08909
BLUEBERRY RD
05462
05591
05592
COUNTY RD
05278
05590
08910
08908
CONGRESS ST
EXIT 7A CONN RD
EXIT 7A SB ON
SPRING ST
05463
THOMAS DRIVE
06682
CUMMINGS RD

TINACC30

MAINE DEPARTMENT OF TRANSPORTATION
TRAFFIC ENGINEERING, ACCIDENT RECORDS SECTION

ACCIDENT SUMMARY I

COUNTY TOWN#	LOW NODE	HIGH NODE	STREET NAME OR ROUTE #	U/R	TOTAL ACCTS	LINK LENGTH	INJURY ACCIDENTS K	A	B	C	PD	PERCENT INJURY	ANNUAL HM VEH-MILES	ANNUAL M ENT-VEHS	ACCIDENT-RATES LINK	NODE	CRITI RATE	CRF
05170	05953	10418	CONGRESS ST	2	1	0.01	0	0	0	0	1	0.0	0.00038		877.19		855.47	1.03
	10418	10419		2	0	0.04	0	0	0	0	0	0.0	0.00167		0.00		624.23	0.00
	10419	10420		2	0	0.02	0	0	0	0	0	0.0	0.00083		0.00		740.81	0.00
	00508	10420		2	3	0.19	0	0	0	0	3	0.0	0.00719		139.08		431.50	0.00
	00508	08908		2	5	0.26	0	0	1	1	3	40.0	0.01189		140.17		384.94	0.00
	08908	08910		2	6	0.20	0	0	1	2	3	50.0	0.00938		213.22		405.72	0.00
	05590	08910		2	1	0.26	0	0	0	1	0	100.0	0.01558		21.39		363.63	0.00
05240	05278	05590	COUNTY RD	2	2	0.10	0	0	1	1	0	100.0	0.00586		113.77		453.22	0.00
	05278	05592		2	7	0.61	1	0	2	0	4	42.9	0.03364		69.36		314.99	0.00
	05591	05592		2	0	0.03	0	0	0	0	0	0.0	0.00168		0.00		623.28	0.00
	05462	05591		2	1	0.03	0	0	0	0	1	0.0	0.00169		197.24		622.33	0.00
			LINK SUBTOTALS-		26	1.75	1	0	5	5	15	42.3	0.08979		96.52		273.15	0.00
			GRAND TOTALS-		76	1.75	1	0	11	17	47	38.2	0.08979	70.381	282.13		426.83	0.66

TINACC30

MAINE DEPARTMENT OF TRANSPORTATION
TRAFFIC ENGINEERING, ACCIDENT RECORDS SECTION

ACCIDENT SUMMARY I

COUNTY TOWN#	LOW NODE	HIGH NODE STREET NAME OR ROUTE #	U/R	TOTAL ACCTS	LINK LENGTH	INJURY ACCIDENTS K	A	B	C	PD	PERCENT INJURY	ANNUAL HM VEH-MILES	ANNUAL M ENT-VEHS	ACCIDENT-RATES LINK	NODE	CRITI RATE	CRF
05	05953	POR,RTE 9,RTE 22,RTE 9W	9	14		0	0	3	3	8	42.9		7.673		0.61	1.03	0.00
05	10418	POR,RTE 22,RTE 9W	2	0		0	0	0	0	0	0.0		4.000		0.00	0.42	0.00
05	10419	POR,RTE 22NB,CUT 9EB TO	2	0		0	0	0	0	0	0.0		4.164		0.00	0.41	0.00
05	10420	POR,RTE 22,22NB,22S,CUT	2	1		0	0	0	0	1	0.0		3.974		0.08	0.42	0.00
05	00508	POR,CONGRESS ST,ENT UNM	9	4		0	0	0	1	3	25.0		4.953		0.27	1.13	0.00
05	08908	POR,CONGRESS ST,BLUEBER	2	1		0	0	0	0	1	0.0		4.631		0.07	0.40	0.00
05	08910	POR,CONGRESS,HUTCHINS,7	2	6		0	0	0	1	5	16.7		7.019		0.28	0.36	0.00
05	05590	TL,PORTLAND-WESTBROOK	2	0		0	0	0	0	0	0.0		5.925		0.00	0.38	0.00
05	05278	WBK,RTE 22,THOMAS DR	2	7		0	0	1	1	5	28.6		5.737		0.41	0.38	1.08
05	05592	WBK,FINCH ST,COUNTY RD.	2	2		0	0	0	0	2	0.0		5.605		0.12	0.38	0.00
05	05591	WBK,COUNTY RD,ORIOLE ST	2	3		0	0	0	1	2	33.3		5.657		0.18	0.38	0.00
05	05462	WBK,SPRING ST,COUNTY RD	9	12		0	0	2	5	5	58.3		11.043		0.36	0.97	0.00
		NODE SUBTOTALS-		50		0	0	6	12	32	36.0		70.381		0.24	0.42	0.00

TINACC30

MAINE DEPARTMENT OF TRANSPORTATION
TRAFFIC ENGINEERING, ACCIDENT RECORDS SECTION

ACCIDENT SUMMARY INPUT

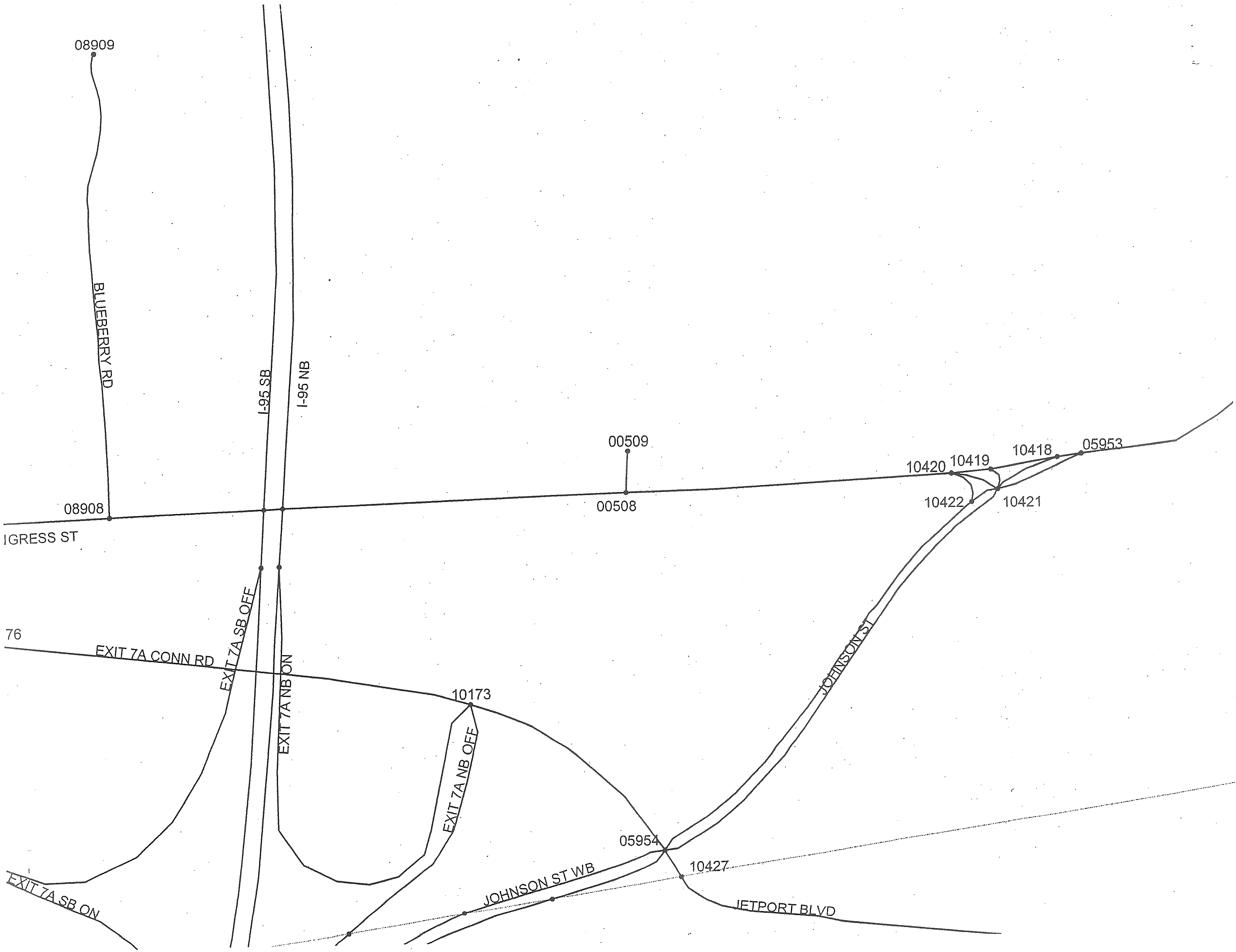
TYPE OF STUDY: NODES AND LINKS TYPE OF REQUEST: ACCIDENT I & II WITH LINK DETAIL
STUDY PERIOD: FROM MONTH 01 YEAR 2002 TO MONTH 12 YEAR 2004

INPUT COMMENTS

REQUEST: CONGRESS ST / COUNTY RD
TOWN: PORTLAND / WESTBROOK

INPUT DATA

ROUTE	COUNTY	FIRST NODE	EXCLUDE FIRST	DISTANCE	SECOND NODE	LAST NODE	EXCLUDE LAST	DISTANCE
0009W	05	05953	0	0.00	10418	10418	0	0.00
0022X		10418	1	0.00	10419	05462	0	0.00


08909
BLUEBERRY RD
08908
IGRESS ST
I-95 SB
I-95 NB
00509
00508
10420
10419
10418
05953
10422
10421
76
EXIT 7A CONN RD
EXIT 7A SB OFF
EXIT 7A NB ON
10173
EXIT 7A NB OFF
JOHNSON ST
05954
10427
JOHNSON ST WB
JETPORT BLVD
EXIT 7A SB ON

Attachment IV - B

WOODARD & CURRAN
Engineering • Science • Operations

CORPORATE OFFICES: Maine, Massachusetts, New Hampshire, New York, Connecticut, Florida
Operational offices throughout the U.S.

February 28, 2006

Jean Fraser
City of Portland
389 Congress Street
Portland, ME 04101

Re: Woodard & Curran Building Addition
Major Site Plan Review - Additional Information

Dear Jean:

On behalf of the joint applicants, CADCAM Associates and Peggy and Eric Cianchette, we are submitting 10 copies of additional information in support of the Major Site Plan Application for the Woodard & Curran Building Addition, originally submitted September 21, 2005, to be used in Planning Board review.

These documents were prepared in accordance with Chapter 14, Land Use, of the Code of Ordinances of the City of Portland, Maine, and meet the applicable sections of the City of Portland, Maine, Technical and Design Standards and Guidelines adopted September 1987, last amended March 2000.

The information that follows includes an updated plan and addresses comments that have arisen from our continued discussion of this project with City staff and with the Maine Department of Environmental Protection (MeDEP). Items included within this submission have been organized by section to which they are relevant.

Section 1 – Development Description

- The landscape plan has been revised based on discussions with the MeDEP and to incorporate recent changes to site layout. Three sugar maples have been added around the entrance to the south lot to aid in buffering 8 relocated parking spaces as well as the existing lot. Shrubs have been added at the base of the retaining wall below the access drive. These shrubs consist of Burkwood Viburnum, Highbush Blueberry and Red Twig Dogwood, which all have the ability to survive in upland and wetland environments.

  An updated copy of Sheet l-1.0 Landscape Plan has been attached to this submission.

Section 5 – Off-Site Facilities

- A copy of a letter from Frank Brancely, with the Portland Public Works Department, has been attached. The letter confirms that the sewer has adequate capacity to transport wastewater generated by the site.

Section 6 – Stormwater Management

- Based on feedback from Marybeth Richardson and Ben Viola at MeDEP, we have prepared an addendum to the stormwater management section dealing with the inspection and maintenance of the subsurface detention structure and the vegetated swale that was added to convey runoff from the access drive to the dry swale at the northeasterly corner of the proposed rear parking lot. The addendum has been attached to this submission.

- Inspection forms for the stormwater treatment or conveyance measures to be located on the proposed site have been included with this submission.

Thank you for the assistance you have provided thus far. We look forward to continuing our work with your office and the Planning Board on this project. If you have any questions or comments, please do not hesitate to contact me at (207) 797-7515, or via email, kvolock@woodardcurran.com.

Sincerely,
WOODARD & CURRAN INC.

Kenneth Volock, P.E.
Engineer

STATE OF MAINE
KENNETH R. VOLOCK
NO. 11062
REGISTERED PROFESSIONAL ENGINEER

KRV/djt
203834.01

Enclosures: Sheet L-1.0 Landscape Plan, as revised February 27, 2006

Letter confirming adequate wastewater capacity for the project from Frank Brancely to Woodard & Curran, dated February 24, 2006

Addendum to Section 6 Stormwater Management, dated February 28, 2006

Stormwater Inspection and Maintenance Forms

PORTLAND MAINE

Strengthening a Remarkable City, Building a Community for Life www.portlandmaine.gov

IV - B - a

Public Works Department
Michael J. Bobinsky, Director

24 February 2006

Mr. Kenneth Volluck, P. E.,
Woodard & Curran,
41 Hutchins Drive,
Portland, Maine 04102

RE: The City's Capacity to Handle Wastewater Flows, from a 22,680 S. F. Office Building Addition to Woodard & Curran Engineering, at 41 Hutchins Drive, Portland, Maine.

Dear Mr. Volluck:

The existing ten-inch diameter sanitary sewer pipe, crossing through the Woodard & Curran property has **adequate capacity to transport**, while The Portland Water District sewage treatment facilities, located off Marginal Way, have **adequate capacity to treat** the anticipated increased wastewater flows of **1,701 GPD**, from your proposed development.

Anticipated Wastewater Flows from the Proposed Office Expansion Project:

A Proposed 22,680 S.F. Office Building:
Assume Five Employees/1,000 S. F. Office Space=5 x 22.68 = 113.4 Employees.
Assume 15 GPD/Employee=113.4x15=1,701 GPD

Total Proposed Increase in Wastewater Flows for this Project =1,701 GPD

The City combined sewer overflow (C.S.O.) abatement consent agreement (with the U.S.E.P.A., and with the Maine D.E.P.) requires C.S.O. abatement, as well as storm water mitigation, in order to offset any increase in sanitary flows, from all projects.

If The City can be of further assistance, please call 874-8832.

Sincerely,
CITY OF PORTLAND
Frank Brancely
Frank J Brancely, B.A., M.A.
Senior Engineering Technician

FJB
cc: Alexander Q. Jaegerman, Director, Planning Division, Department of Planning, and Urban Development, City of Portland
Jean Fraser, Planner, Department of Planning, and Urban Development, City of Portland
Eric Labelle, P.E., City Engineer, City of Portland
Bradley A. Roland, P.E., Environmental Projects Engineer, City of Portland
Stephen K. Harris, Assistant Engineer, City of Portland
Desk file

O:\Engshare\FJB\Capacity Letters\Hutchins Drive 41
C:\Frank's\Capacity Letters\Hutchins Drive 41

ADDENDUM NO. 1 TO:

6. STORMWATER MANAGEMENT

The following information should be added to Section 6 Stormwater Management, as submitted to the City of Portland and to the Maine Department of Environmental Protection, on February 23, 2006.

6.4 MAINTENANCE OF STORMWATER SYSTEMS

The following maintenance procedures will be followed for vegetated swales and the subsurface detention structure:

6.4.4 Vegetated Swales

Vegetated swales will be inspected semi-annually in spring and fall. Additionally, vegetated swales will be inspected following major storms. These inspections will ensure that there is no erosion in the swale and that sediment does not build up.

Each vegetated swale will be mowed to a minimum mow height of six inches. Cut vegetation will be removed to prevent the decaying material from adding pollutants to stormwater runoff. Sediment will be removed annually. Any eroding areas will be repaired immediately. Whenever sediment removal or repairs due to erosion are required, the Facilities Manager would likely hire a local contractor to perform this work.

6.4.5 Subsurface Detention Structure

The subsurface detention structure will be inspected semi-annually, in spring and fall, and following major storms through the maintenance port. These inspections will ensure that runoff does not become trapped in the structure and sediment does not build up.

Should runoff become trapped within the structure, attempts will be made to remove blockage from the outlet by either snaking or high pressure water. If these efforts are unsuccessful, a portion of the structure will need to be excavated to remove the blockage within the structure itself. If sediment builds up in the structure, the sediment will be resuspended using high pressure water through the maintenance port. The Facilities Manager would hire a local contractor to perform this work.

6.6 ATTACHMENTS

The following additional attachments have been included with this addendum:

Catch Basin Semi-Annual Visual Monitoring Record

Parking Lot Annual Visual Monitoring Record

Filter Basin Semi-Annual Visual Monitoring Record

Dry Swale Semi-Annual Visual Monitoring Record

Vegetated Swale Semi-Annual Visual Monitoring Record

Subsurface Detention Structure Semi-Annual Visual Monitoring Record

41 HUTCHINS DRIVE
CATCH BASIN
SEMI-ANNUAL VISUAL MONITORING RECORD

CB#: ______ Date:______________ Time:____________

Last Date and Approximate rainfall amount:____
Estimated depth of water in sump____

Characteristics of Catch Basin:

Grate Condition____

Outlet Condition____

Sediment Present____

Floatables or Oil Sheen ____

Other Observances ____

____

____

Observations of surrounding drainage area during visual monitoring: ___________________________

____

____

Signature of person conducting visual monitoring:

____ ___________

Name Date

____

Title

41 HUTCHINS DRIVE
PARKING LOT
ANNUAL VISUAL INSPECTION RECORDS

Parking Lot # ______________________________
Date/Time ______________________________
Weather Conditions ______________________________
Inspector (s) ______________________________

1. Problems observed:
____
____
____
____
____

2. Follow-up actions required following inspection:
____
____
____
____
____

3. Name and title of person(s) notified of inspection results:

______________________________ ____________
Name Title date

______________________________ ____________
Name Title date

4. Signature of inspector: ______________________________
Name Title

____
date

41 HUTCHINS DRIVE
FILTER BASIN
SEMI-ANNUAL VISUAL MONITORING RECORD

Basin location:____________ Date:______________ Time:____________

Last Date and Approximate rainfall amount:____
Estimated depth of Water in basin____

Characteristics of Basin:

Vegetation State____
Sedimentation Present____
Embankment Condition____
Emergency Spillway Condition_____________________________________
Outlet Control Structure Condition_________________________________
Floatables or Oil Sheen ____
Other observances ____
____
____

Observations of basin drainage area during visual monitoring: ____________________
____
____

Signature of person conducting visual monitoring:

____ ____________
Name date

____
Title

41 HUTCHINS DRIVE
DRY SWALE
SEMI-ANNUAL VISUAL MONITORING RECORD

Swale location:____________ Date:______________ Time:____________

Last Date and Approximate rainfall amount:____
Estimated depth of Water in swale____

Characteristics of Swale:

Vegetation State_______________________________________
Sedimentation Present___________________________________
Embankment Condition__________________________________
Emergency Spillway Condition____________________________
Outlet Control Structure Condition_________________________
Floatables or Oil Sheen _________________________________
Other observances ______________________________________
____
____

Observations of swale drainage area during visual monitoring: ______________________
____
____

Signature of person conducting visual monitoring:

____ ____________
Name date

____
Title

41 HUTCHINS DRIVE
VEGETATED SWALE
SEMI-ANNUAL VISUAL INSPECTION/MAINTENANCE RECORDS

Nearest Unit # ______________________

Date/Time __________________________

Maintenance Person(s)__________________

1. Type of maintenance required and summary of maintenance activity performed:

____
____
____
____
____
____
____

2. Follow-up actions required as result of maintenance:

____
____
____
____
____
____

3. Name and title of person(s) notified of maintenance activity results:

____________________________________ ____________
Name Title Date

____________________________________ ____________
Name Title Date

4. Signature of maintenance person: ______________________________
Name Title

____
Date

41 HUTCHINS DRIVE
SUBSURFACE DETENTION STRUCTURE
SEMI-ANNUAL VISUAL MONITORING RECORD

Date:______________ Time:____________

Last Date and Approximate rainfall amount:____

Estimated depth of Water in structure (if any)____

Characteristics of Structure:

Sedimentation Present____

Outlet Pipe Condition____

Emergency Outlet Pipe Condition____________________________________

Floatables or Oil Sheen ____

Other observances ____

____

____

Observations of structure drainage area during visual monitoring: ____________________

____

____

Follow-up actions required as result of observations:

____

____

Signature of person conducting visual monitoring:

____ ____________

Name date

____

Title

Attachment- I.V - C

From: Eric Labelle
To: Jean Fraser
Date: 3/6/2006 11:01:49 AM
Subject: Re: W & C

Here is my responses Jean. I've also added a comment #5.
Eric

>>> Jean Fraser 3/6/2006 9:45:37 AM >>>
Eric,

This is going to a Hearing on March 14 and so i am trying to tie up loose ends.

1. You asked for a drainage easement over the unnamed brook that runs across the site from Hutchins towards Stroudwater... and that is being arranged (or will be a condition).

However, in our discussions with MDEP it came to light (not sure if it was on the original plans) that there was also a drainage easement over a smaller water channel to the east of the existing complex (around the back of the buildings and the proposed parking behind the new building).

Alex wants me to bring this other channel to the attention of Board members and a plan showing setbacks will be included in the packet.

Does the city also want a drainage easement over that one as well???

If the other drainage way also drains flows from the City street, it would be prudent to acquire an easement.

2. Also, they have shown bituminous curb along the internal road access that we are giving a waiver on (so it can be 20 feet wide). Given the narrowness, should we require granite curbing for the section between the wetlands and the new building?

Since this drive will remain private, the curb materials used should be left to the discretion of the developers.

3. If you are sending an e-mail re this, could you please confirm that you support the waiver for the road width being 20 feet- you said you weren't alarmed by it in 1.6.06 e-mail.

I support the drive entering the parking lot be 20 feet. This assumes no parking along the drive.

4. Could you also please confirm when the request for a public easement was sent to the Portland Water District.

The application has been signed by the Director and has been sent to the PWD for consideration.

5. Does the City object to other uses within the sewer easement such as a water main?

No, so long as the water main remains a minimum of 10 from the sewer main.

Many thanks
Jean

Attachment IV-D

(3 pages)

Sebago Technics
Engineering Expertise You Can Build On

05P225

TO: **Jean Fraser - Planner**

FROM: **Jim Seymour - Development Review Coordinator, Sebago Technics, Inc.**

RE: **Major Site Plan Review: 41 Hutchins Drive, Woodard & Curran Expansion**

DATE: **March 8, 2006**

Sebago Technics has reviewed the revised submittal of the Major Site Plan application and supporting documentation with latest revision dates of February 23 and 28th, 2006 for the proposed expansion of their current office complex located at 41 Hutchins Drive in the City of Portland. This development is on a lot, which was part of the Stroudwater Estates Subdivision, which obtained approval of a Maine DEP Site Location of Development permit in the 1980's. Since this site has not reached a threshold of 3 acres impervious it has not triggered a separate requirement for a Site Location permit based on current DEP standards. However, the applicant has been directed by staff, and the DEP to address stormwater permits and provisions necessary to meet the approval orders previously in effect, and meet compliance of the Chapter 500 Stormwater Law (1997 and 2005 version or combination of). We respectfully offer the following comments in outline format:

1. <u>Stormwater Management</u>

Review of the stormwater management plan and subsequent runoff quantity and quality calculations were in a state of flux with the recent transition of the new Chapter 500: Stormwater Management Law and given the City was relieved of its delegated review authority, both the MeDEP and the City of Portland were not clear on the review level required for this site (quantity vs. quality). Since the last submission to the Board the DEP has coordinated treatment measures following new Stormwater BMP's and feel the if the DEP standards have been met that they are equal or exceed City standards for runoff quality treatment. The use of dry-swales and filtration basins for runoff treatment is actually what we initially recommended and is in accordance with DEP requirements. Therefore we find the project design is in conformance for both stormwater quantity and quality control as supported by the stormwater narrative and calculations dated 2/22/06

All other previous requests for information have been adequately addressed regarding details and revisions pertaining to stormwater collection or treatment.

2. **Road Access/Circulation**

A. Please refer to comments from the City Traffic Engineer for concerns of traffic movements, trip generation, and internal movements.

B. The access lanes per driveway standards are required to be 24 feet for two-way access. The applicant has requested a waiver of the standard because of the limitations of the wetlands, which traverse the site. The claim is that any further extension of the fill for the road widening will create difficulties in permitting and unnecessary impacts to the wetlands. The proposed road is 20 feet wide with guardrails on the wetland side and a 5-foot grass esplanade against the building.

This property is unique in that the development and the wetland restraint is a direct result of the actions taken by the developer/applicant. The building size, configuration, parking layout, and expansion planning was determined by the applicant. Property lines and existing buildings are not the restriction, but a natural resource is. The width of 20 feet is marginal, and it is clear 24 feet width is desirable.

Our feeling is that both the City and applicant, to accomplish and improvement for safety and vehicular passage must have in place specific maintenance plans for winter conditions and snow removal. The applicant has compiled areas as designated on the plan that adequately address concerns of storage. Given the applicants constraints with wetland/stream buffers and permitting, and shown winter maintenance can be done without safety being compromised we agree to the 24 foot aisle width waiver request to allow the width down to 20 feet for the access road.

3. **Utilities**

A. Letters to serve and available capacities have been submitted showing that adequate service exists for the development.

B. There is a 12 inch steel culvert shown outleting into the stream from the Water District easement. It appears that this is a blow-off from their main. We recommend that an easement around this drainage pipe such that either the City or Water District has rights to maintain on private property be completed prior to issuance of occupancy

4. **Grading & Erosion Controls**

The applicant has added notes addressing mud tracking, pavement cleaning, dust control, and or street sweeping during construction, and has addressed adequate basin protection during construction. Our only comment is that if construction occurs during winter periods then The Development Review coordinator may require silt sacs if conditions of hay bale barrier failure occurs.

5. **General**

A. The project has an attached Geotechnical report, which shall be adhered to during construction. The plans shall add a note referencing the construction measures required for such foundation and retaining wall construction. The final retaining wall design shall be designed by a profession engineer, and reviewed and approved by the code enforcement officer. It also may be beneficial to require weekly reports from a geotechnical engineer or geologist summarizing findings and construction monitoring during excavation and preparation of the retaining walls and building foundations. The applicant has agreed in a response to these recommendations but has not placed such notes on the site plan. Final wording and conditions may be left with the Board, to where they are appropriate.

B. The applicant has filed a Maine Construction General Permit for this project. This must be obtained prior to the start of construction. Additionally the applicant has been working with Public Works to assure plans and datum is in accordance with City datum for sewer project work. Please contact Bill Clark at Public Works to confirm Survey information requirements.

Overall, the project has addressed most of the permitting challenges regarding stream, wetland protection and stormwater requirements. We have only minor recommendations for monitoring, tying down an easement to the water district for a blow-off valve discharge pipe, and compliance with City standards during construction If the board determines that the items left can be agreed to, and will be completed by the applicant, we will support approval for the project with/or without conditions.

Please contact our office if you have any questions.

JRS/jrs

Attachment IV E

WOODARD & CURRAN
Engineering · Science · Operations

CORPORATE OFFICES: Maine, Massachusetts, New Hampshire, New York, Connecticut, Florida
Operational offices throughout the U.S.

March 9, 2006

Jean Fraser
City of Portland
389 Congress Street
Portland, ME 04101

Re: Woodard & Curran Building Addition
Major Site Plan Review - Additional Information

Dear Jean:

On behalf of the joint applicants, CADCAM Associates and Peggy and Eric Cianchette, we are submitting 10 copies of additional information in support of the Major Site Plan Application for the Woodard & Curran Building Addition, originally submitted September 21, 2005, to be used in Planning Board review.

The information that follows includes updated plans and addresses comments that have arisen from our continued discussion of this project with City staff and with the Maine Department of Environmental Protection (MeDEP). These documents were prepared in accordance with Chapter 14, Land Use, of the Code of Ordinances of the City of Portland, Maine, and meet the applicable sections of the City of Portland, Maine, Technical and Design Standards and Guidelines adopted September 1987, last amended March 2000.

The following potential conditions of approval were identified in the Planning Board Report, prepared for the Project in anticipation of its Public Hearing originally scheduled for February 7, 2006. Responses have been organized in order of the potential conditions of approval.

Potential Condition:

That the applicant receives and submits the required permits from the MDEP prior to the issuance of a building permit.

Response:

Through discussions with MeDEP, the plan can be approved. An Order of Approval is anticipated within the next few weeks. An email from Marybeth Richardson, Project Manager for MeDEP, stating as such has been attached to this submission.

Potential Condition:

That the applicant conducts a post-development analysis of the Congress Street/Hutchins Drive intersection during the weekday AM and PM peak hours to ensure safe and reasonable operations will be provided following completion of the project. In the event that modifications are needed to the intersection to achieve safe and reasonable operations, the applicant shall make a proportional financial contribution to the cost of such modifications.

Response:

Gorrill-Palmer Consulting Engineers, Inc. has conducted the requested analysis of the intersection of Congress Street and Hutchins Drive. Findings were originally submitted to the City on February 23, 2006. At the request of the City Traffic Engineer, the findings were revised to reflect 96 additional employees rather than the 64 additional employees that Woodard & Curran would be able to employ. The revised findings are attached to this submission and have been forwarded directly to the City's Traffic Review Engineer.

Potential Condition:

That the applicant shall re-evaluate stormwater treatment factors and submit revised calculations and show all buffers on the site plan with labels indicating the width, slope and percentage of removal efficiency for each buffer shown.

Response:

Based on conversations with the City's DRC and with the stormwater review engineer for the Maine Department of Environmental Protection (MeDEP), treatment factors have been reassessed for the Filtration Basins. The stormwater quality calculations have been rerun using a TSS removal factor of 90% for the basins. A dry swale has been added off the end of the rear parking lot to treat runoff from the access road and the rear parking lot. Through the Filtration Basins and the dry swale, the Sliding Scale TSS removal standard (45% for this project) can be achieved without the use of buffers. The revised Stormwater Management Plan was submitted to the City and to MeDEP on February 23, 2006.

Potential Condition:

The applicant shall submit a letter from the Engineering Division of Public works verifying adequate sewer capacity to serve this project.

Response:

A letter from the City of Portland Public Works Department, dated February 24, 2006, verifying adequate sewer capacity to serve the project, was received and forwarded to Portland Planning in our submission of February 28, 2006.

Potential Condition:

The applicant shall submit a Snow Removal and Maintenance Plan for the 20 foot wide roadway adjacent to the new building to the satisfaction of the Traffic Engineer and the Development Review Coordinator (Jim Seymour of Sebago Technics). The Plan to show how this access will be maintained and kept free of obstructions to ensure fire access if needed.

Response:

Snow storage areas have been added to Sheet C201 Proposed Site Plan. The 20 foot driveway width will be maintained; no snow storage is proposed for along the roadside.

Potential Condition:

The applicant shall present the sidewalk, drainage and sewer easements for final review and approval by Corporation Counsel.

Response:

Draft language for the drainage easement and for the relocated sewer easement is being prepared for the City's review. We are still awaiting final word on whether the City is interested in the drainage easement associated with the small brook along the eastern edge of the property, or only in the drainage easement associated with the larger brook running through the center of the site.

Through discussions with Norm Twaddel at the Portland Water District (PWD), the sidewalk easement will be presented to the PWD Planning Committee on Monday, March 13th, and to the full Board of Directors for vote on Monday, March 27th.

Potential Condition:

That the applicant shall revise the plan to provide a 24 foot wide roadway where the main access to the site meets Hutchins Drive.

Response:

The width of the driveway entrance at Hutchins Drive has been increased to 24 feet.

Potential Condition:

The applicant shall provide a fire hydrant on the access road to meet the fire Department requirement of a hydrant every 500 feet.

Response:

There is an existing hydrant located next to the main entrance to the building. Every face of the building can be reached in less than 500 feet from the hydrant. An additional hydrant is not necessary to meet the 500 foot requirement and is not proposed as part of the project.

Potential Condition:

The applicant shall submit details of the sidewalk extension and sewer diversion, which must be in accordance with the City Standards and directly reviewed and approved by Public Works.

Response:

A detail showing typical sidewalk construction in accordance with City design standards has been added to Sheet C301.

Rim and invert elevations have been added for the proposed sewer relocation on Sheet C202 Proposed Utility Plan. Due to the small amount of sewer design involved, profiles have not been included. It is our understanding the sewer layout and proposed easement have been reviewed and found acceptable by City of Portland Public Works; we will continue to work with Public Works as we finalize construction documents.

Potential Condition:

That the applicant shall address the comments raised by the Development Review Coordinator (Jim Seymour of Sebago Technics) in his memorandum of January 31, 2006 concerning labeling of rim elevations, curbing along the access road, curbing of the satellite parking lot islands, the need for an underdrain for the underground detention/storage and the need for construction elevation benchmarks with the datum specified.

Response:

Curbing along the access drive has been extended toward the entrance where the road curves and runoff velocities are expected to be higher. No curbing is proposed where the drive takes a straight course, in order to encourage some amount of filtering as runoff passes through the landscaped area. These changes can be seen on Sheet C201 Proposed Site Plan.

Cape Cod curbing has been added to the internal parking lot islands in the north parking lot, as can be seen on Sheet C201 Proposed Site Plan. Through discussions with the Development Review Coordinator, the Cape Cod curb detail has been revised to provide a one foot curb width rather than a two foot width. The revised detail can be seen on Sheet C301 Civil Details 2

Sheet C202 Proposed Utility Plan has been revised to indicate rim elevations for all structures.

A boring in the area of the proposed subsurface detention structure indicated saturated soils at an elevation of approximately 38 feet. The base of the detention structure will be at 40, providing two feet of separation from the water table. Additionally, the subsurface detention structure will be constructed over a geogrid placed directly on existing soils. The primary outlet is located at the base of the structure; therefore no build-up is expected and no underdrain is proposed.

The plans indicate a benchmark in Utility Pole #3.5 between the main entrance to the site and the entrance to the north parking lot. The original survey references the existing site as the vertical datum. We are currently working with Bill Clark to locate a nearby City benchmark to determine the relationship between our vertical datum and the City standard, NVGD 29. Upon completion of the project, as-built drawings for the relocated sewer will be provided to the City based on the City's vertical datum.

Potential Condition:

The applicant to adhere to the submitted Geotechnical Report during construction and involve a Geotechnical Engineer at regular intervals during the construction of foundations and retaining walls; also to amend the plans to reference the construction measures required for such foundation and retaining wall construction. The final retaining wall design shall be designed by a professional engineer and reviewed and approved by the code enforcement officer.

Response:

The Geotechnical Report shall be adhered to in preparing final design of the proposed project. Additionally, a copy of the report will be included in the construction specifications. S.W Cole will be enlisted to review final design documents to ensure the recommendations presented in the Geotechnical Report have been met as applicable. Construction monitoring and testing will be incorporated into the final construction documents.

<u>*Potential Condition:*</u>

The applicant to note that no further impervious surfaces shall be created on this site and that further development should be contained within the existing paved and built areas.

<u>Response:</u>

This potential condition was discussed when we met with City staff and with MeDEP at the Portland Planning Office on February 14, 2006. Although the site would be left with very little area for future redevelopment, a condition such as this does raise a few concerns. This condition would prevent any redevelopment involving relocation of impervious areas, including creating impervious surfaces outside of natural resource setbacks while revegetating areas within the setbacks. The condition also does not take into account any provision for changes to regulatory requirements, and does not allow for future improvements in stormwater treatment or other resource protection technologies.

Additionally, we offer the following information relevant to other issues we have discussed:

- Sheet L-1.0 Landscape Plan has been revised to incorporate recent comments from the City Arborist. The updated landscape plan has been sent directly to the City Arborist and has been enclosed within this submission.

- At the request of the Planning Department, we have prepared a Proposed Site Plan with 25-foot and 75-foot setbacks from the wetland and from each brook on the site. These setbacks have been indicated in color to allow the plan to be interpreted more easily. The setbacks are shown on Figure 8.1 Proposed Site Plan With Setbacks Indicated, which has been enclosed with this submission.

Thank you for the assistance you have provided thus far. If you have any questions or comments, please do not hesitate to contact me at (207) 797-7515, or via email, kvolock@woodardcurran.com.

Sincerely,
WOODARD & CURRAN INC.

Kenneth Volock, P.E.
Engineer

STATE OF MAINE
KENNETH R. VOLOCK
NO. 11062
REGISTERED PROFESSIONAL ENGINEER

KRV/
203834.01

Enclosures: Email from Maine Department of Environmental Protection to Woodard & Curran, dated March 8, 2006
Letter from Gorrill-Palmer Consulting Engineers, Inc. to Mr. Tom Errico, P.E., dated March 2, 2006
Drawings, revised March 8, 2006, including:
C200 Erosion and Sedimentation Control Plan

C201 Proposed Site Plan
C202 Proposed Utility Plan
C301 Civil Details – 2
L–1.0 Landscape Plan
Figure 8.1 Proposed Site Plan with Setbacks Indicated

IV - E - a

Kenneth Volock

From: Richardson, Marybeth [Marybeth.Richardson@maine.gov]
Sent: Wednesday, March 08, 2006 10:35 AM
To: Kenneth Volock
Cc: Viola, Ben
Subject: RE: W&C Addition Revised Landscape Plan

Ken:

I have done a cursory review of the CADCAM/Cianchette project as revised and, based on my review and on preliminary comments from Ben Viola, I believe the project can be approved. However, an order for approval will probably not be issued for another week or two. Also, as discussed, we will copy Ben's review comments to Jim Seymour when they are finalized.

Marybeth Richardson
Division of Land Resource Regulation
Bureau of Land and Water Quality
(207) 822-6335
marybeth.richardson@maine.gov

-----Original Message-----
From: Kenneth Volock [mailto:kvolock@woodardcurran.com]
Sent: Tuesday, February 28, 2006 8:51 AM
To: Richardson, Marybeth
Subject: W&C Addition Revised Landscape Plan

Marybeth,

Attached is the revised landscape plan. Please note the addition of clusters of Burkwood Viburnum, Highbush Blueberry, and Red Twig Dogwood at
the base of the retaining wall below the access drive.

I intend to submit two hardcopies of the revised Landscape Plan later today,
provided the additional plantings as proposed will be acceptable to the Department. Please let me know if you see the need for further revision prior to submittal.

Kenneth Volock
Woodard & Curran
800-426-4262

IV - E - 6

GP Gorrill-Palmer Consulting Engineers, Inc.

Traffic and Civil Engineering Services

PO Box 1237
15 Shaker Rd.
Gray, ME 04039

207-657-6910
FAX: 207-657-6912
E-Mail:mailbox@gorrillpalmer.com

March 2, 2006

Mr. Tom Errico, PE
Wilbur Smith Associates
59 Middle Street
Portland, ME 04101-4211

COPY

Re: Proposed Expansion of Woodard and Curran
Updated Analysis

Dear Tom:

Our office is responding to a February 28, 2006 email sent to Woodard and Curran from Jean Frasier with the City of Portland, which stated the following:

"At present there are 111 employees in your existing complex on the site; there are a further 32 W&C employees now working in the leased premises that were formerly Clark Insurance (not a part of your site). The potential employee level once the new addition is fully occupied is 207 on the site under consideration.

So I would suggest that the traffic/junction capacity assessment should be on 207 less 111 (96 employees) as the 32 employees in the other building will still potentially remain there (as the building is already there and will be reoccupied when the W&C folks move out) but employed by another party.

So there will be an additional 96 employees on the W&C site and this figure should be used for the assessment.

I would be grateful if you could take this up with Gorrill Palmer and clarify whether the figure of 64 is correct or not. Our Traffic Engineer is holding on his review pending confirmation that the figure and the way it was arrived at is correct, given that it appears to underestimate the traffic generation and thus the capacity needed at this junction."

Based on this information, our office has compiled updated analysis for 96 employees, which would result in 65 and 76 trip ends for the AM and PM peak hours, respectively, an increase of 16 and 14 trip ends over the 49 and 61 trip ends utilized for the previous analysis for the AM and PM peak hours.

Capacity Analyses

Our office completed analysis for the predevelopment and postdevelopment conditions utilizing the Synchro software package. Based on recent comments from you on another project in Portland, our office is providing you with the HCM-based capacity results from Synchro. The results are summarized in the following table:

Level of Service for Congress Street at Hutchins Drive

Lane Group	AM Peak Hour				PM Peak Hour			
	Predevelopment		Postdevelopment		Predevelopment		Postdevelopment	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Congress EB LT	17	B	17	C	24	C	26	C
Congress EB TH	43	D	44	D	33	C	34	C
Congress EB RT	4	A	4	A	16	B	18	B
Congress WB LT	19	B	19	B	24	C	26	C
Congress WB TH/RT	16	B	17	B	38	D	42	D
Exit 46 Connector NB LT	44	D	43	D	35	D	44	D
Exit 46 Connector NB TH/RT	18	B	19	B	15	B	15	B
Hutchins SB LT/TH	49	D	54	D	40	D	49	D
Hutchins SB RT	34	C	34	C	29	C	30	C
Overall	**29**	**C**	**30**	**C**	**30**	**C**	**34**	**C**

As can be seen from the above table, all lane groups continue to operate at a level of service 'D' or better for all scenarios. A copy of the Synchro/HCM printouts is enclosed with this letter.

Please contact me should you have any further questions regarding this project.

Sincerely,

Gorrill-Palmer Consulting Engineers, Inc.

Thomas L. Gorrill, P.E., PTOE
President

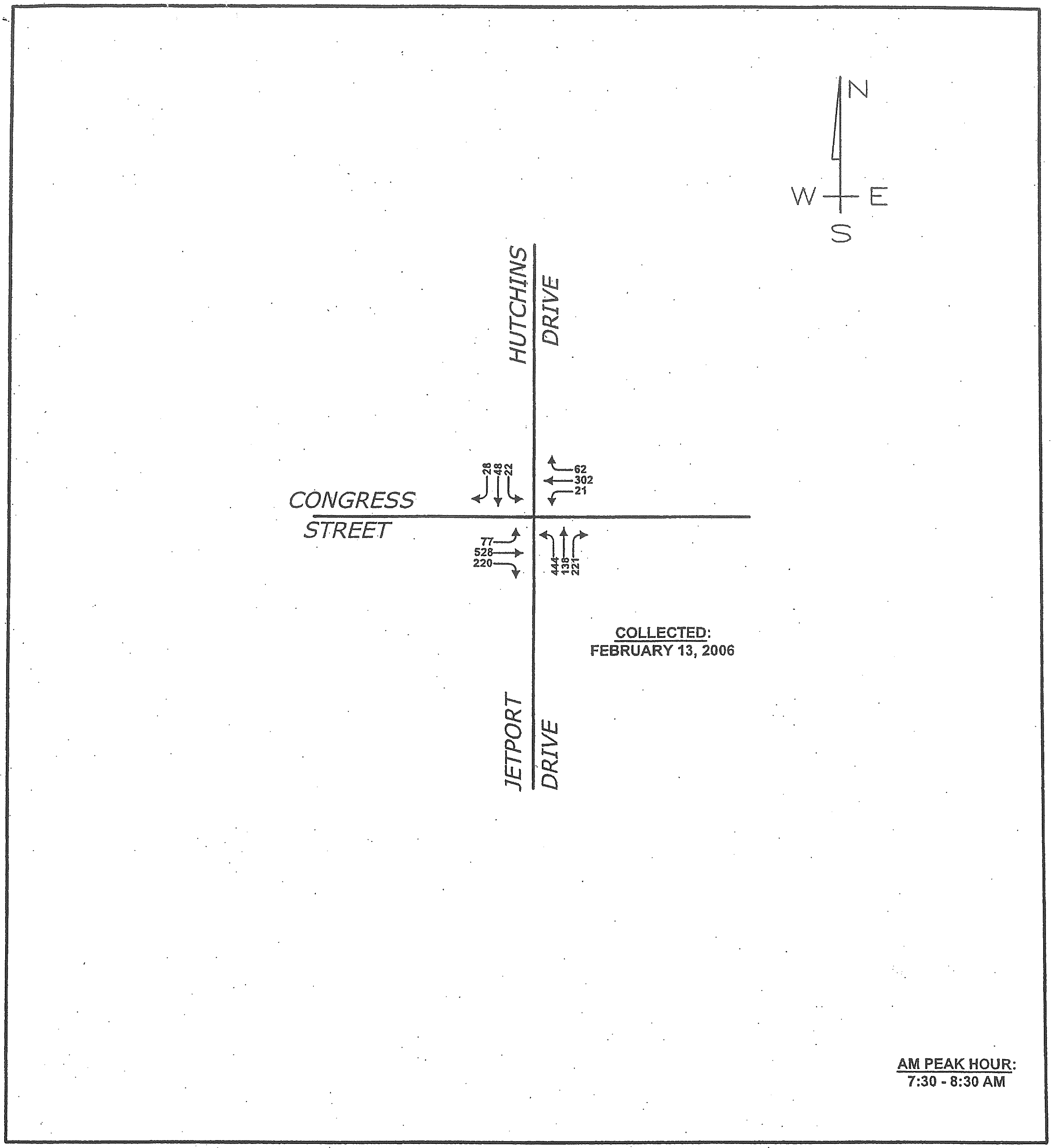
Enclosure

Copy: Barry Sheff, Woodard and Curran

TLG/jjb/JN1495/Errico2-17-06.doc

Raw Volumes - AM Peak Hour

Figure No. 1



PROPOSED EXPANSION - WOODARD AND CURRAN, PORTLAND, MAINE

GP Gorrill–Palmer Consulting Engineers, Inc.
Traffic and Civil Engineering Services

PO Box 1237
15 Shaker Road
Gray, ME 04039

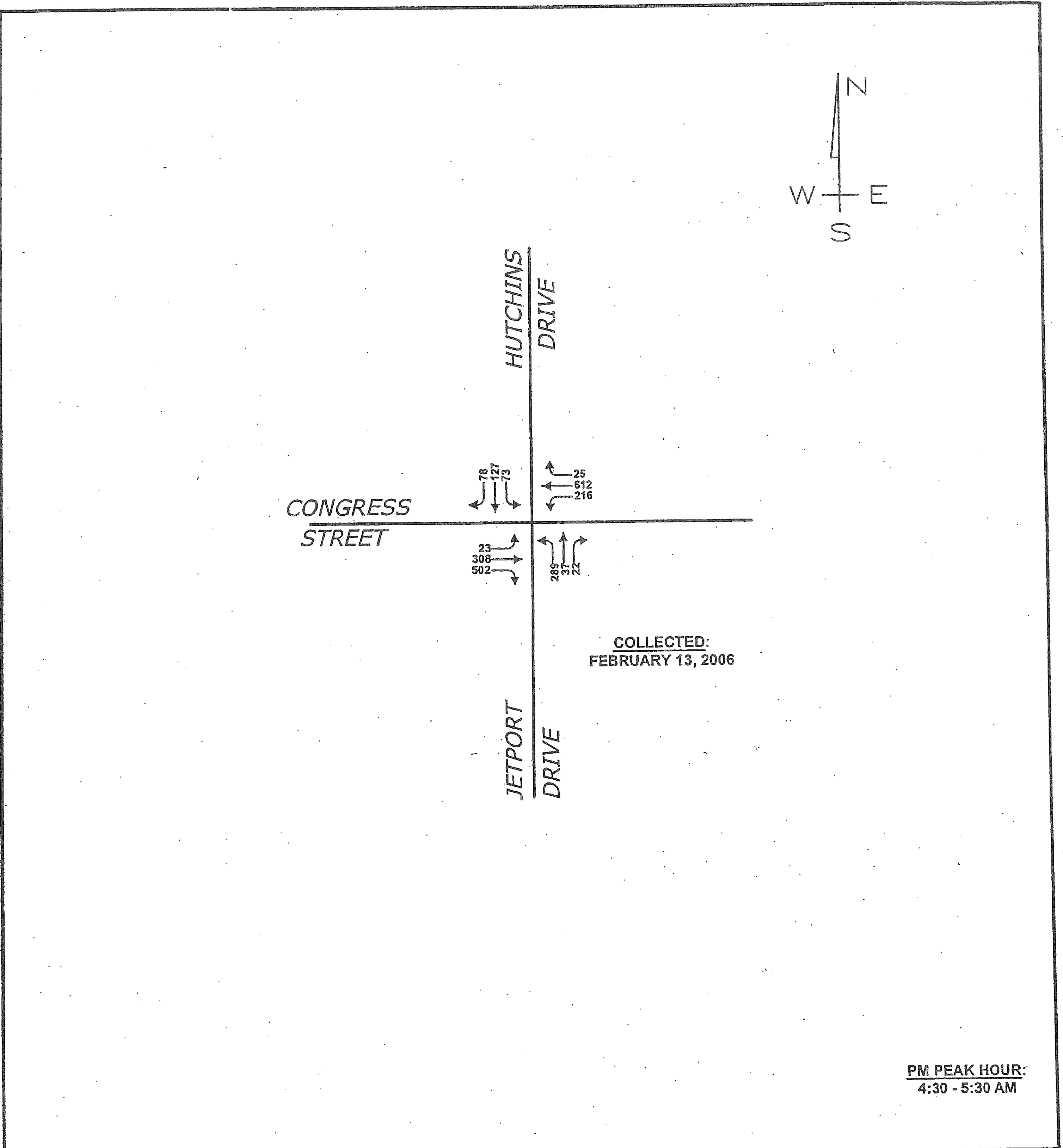
207-657-6910
Fax: 207-657-6912
mailbox@gorrillpalmer.com
www.gorrillpalmer.com

Design: PDO
Draft: ZRJ
Checked: JJB

Date: MONTH 2006
File Name: 1495-TRAF.dwg

Raw Volumes - PM Peak Hour

Figure No. 2



PROPOSED EXPANSION - WOODARD AND CURRAN, PORTLAND, MAINE

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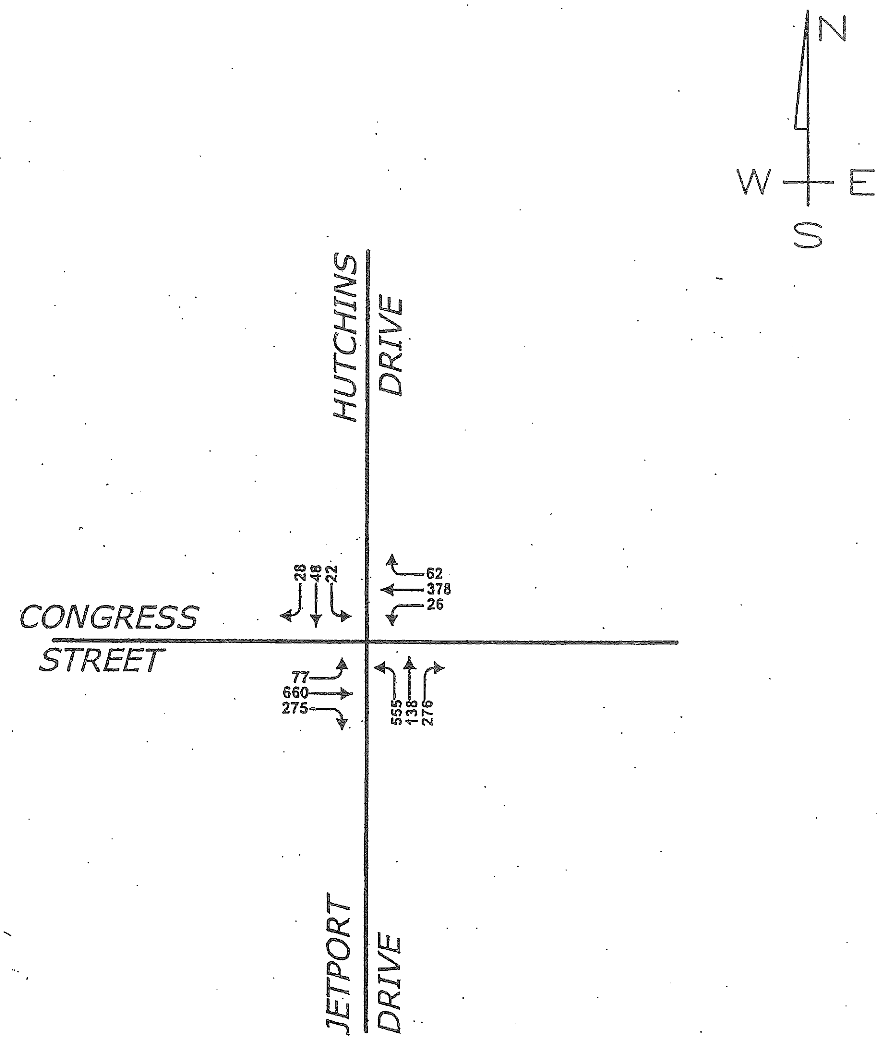
Date: MONTH 2006
File Name: 1495-TRAF.dwg

Seasonally Adjusted Volumes - AM Peak Hour

Figure No. 3



CONGRESS WEST OF BLUEBERRY
TYPE I

SEASONAL ADJUSTMENT: $\frac{1.09}{0.87} = 1.25$

AM PEAK HOUR:
7:30 - 8:30 AM

PROPOSED EXPANSION - WOODARD AND CURRAN, PORTLAND, MAINE

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Checked: JJB

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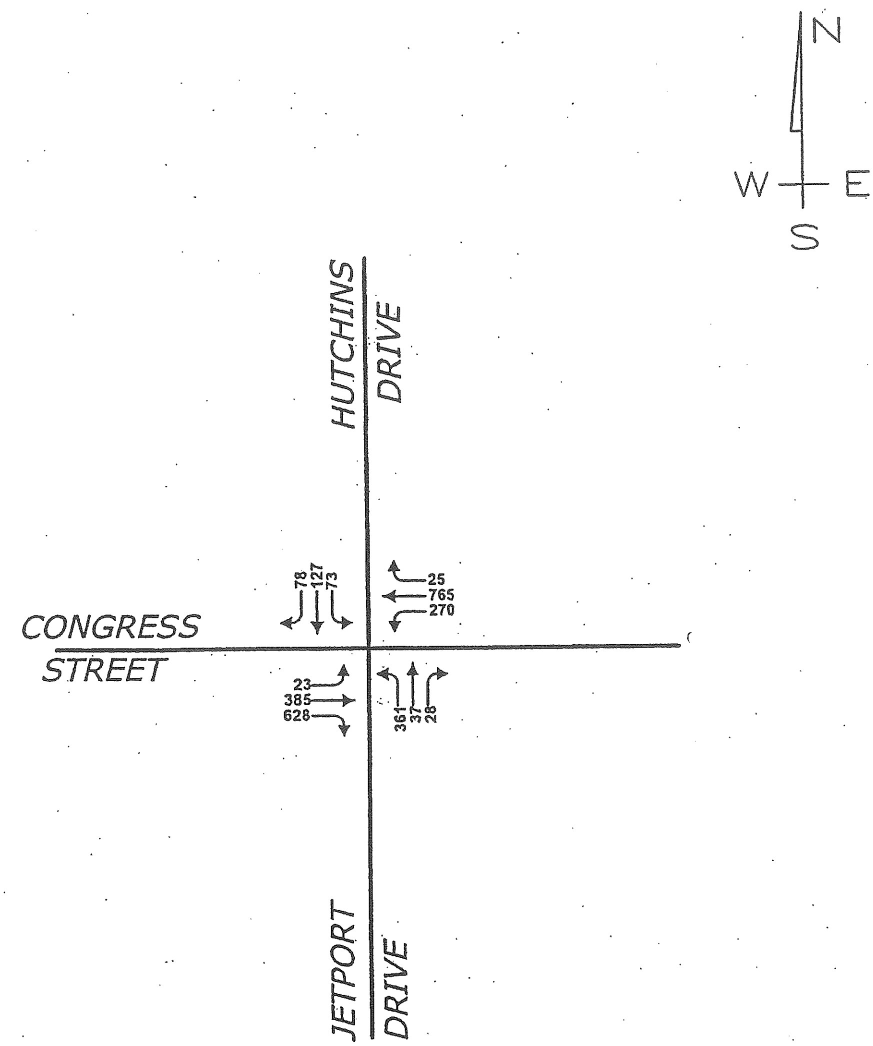
File Name: 1495-TRAF.dwg

Seasonally Adjusted Volumes - PM Peak Hour

Figure No. 4



CONGRESS WEST OF BLUEBERRY
TYPE I

SEASONAL ADJUSTMENT: $\frac{1.09}{0.87} = 1.25$

PM PEAK HOUR:
4:30 - 5:30 PM

PROPOSED EXPANSION - WOODARD AND CURRAN, PORTLAND, MAINE

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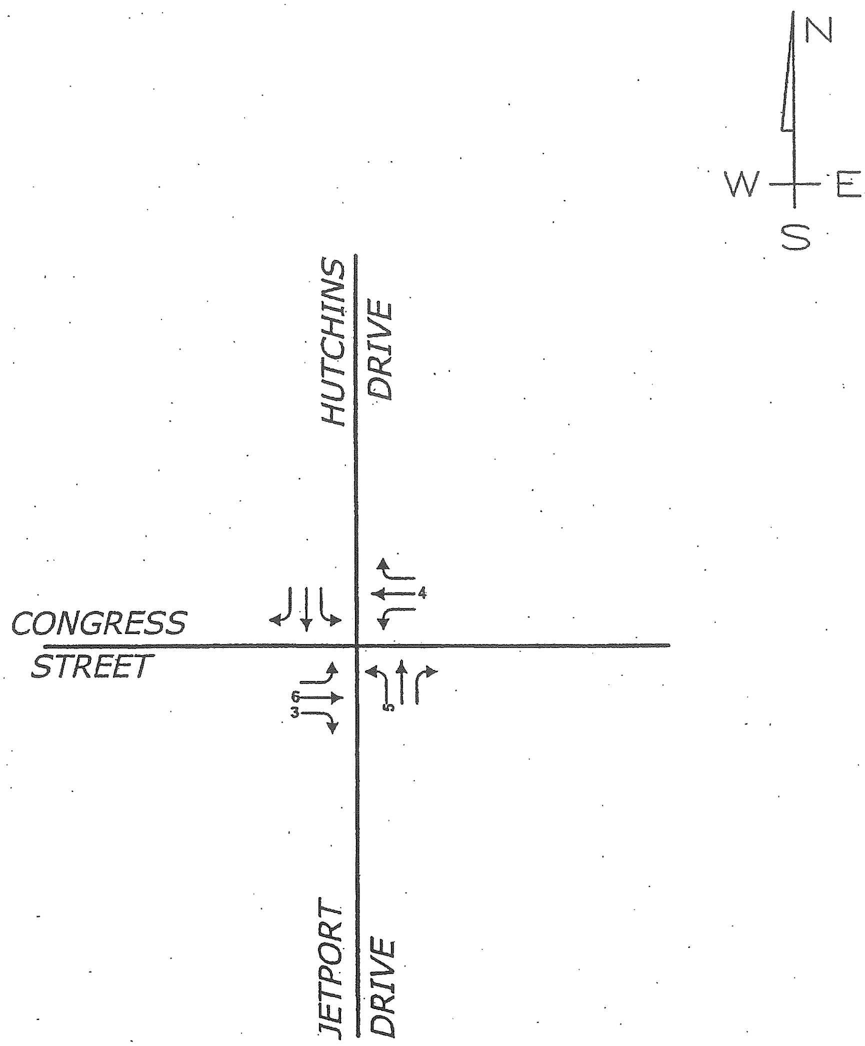
Design: PDO
Draft: ZRJ
Checked: JJB

Date: MONTH 2006
File Name: 1495-TRAF.dwg

Other Development - AM Peak Hour

Figure No. 5



OTHER DEVELOPMENT INCLUDES:
DUNKIN DONUTS: XX

PROPOSED EXPANSION - WOODARD AND CURRAN, PORTLAND, MAINE

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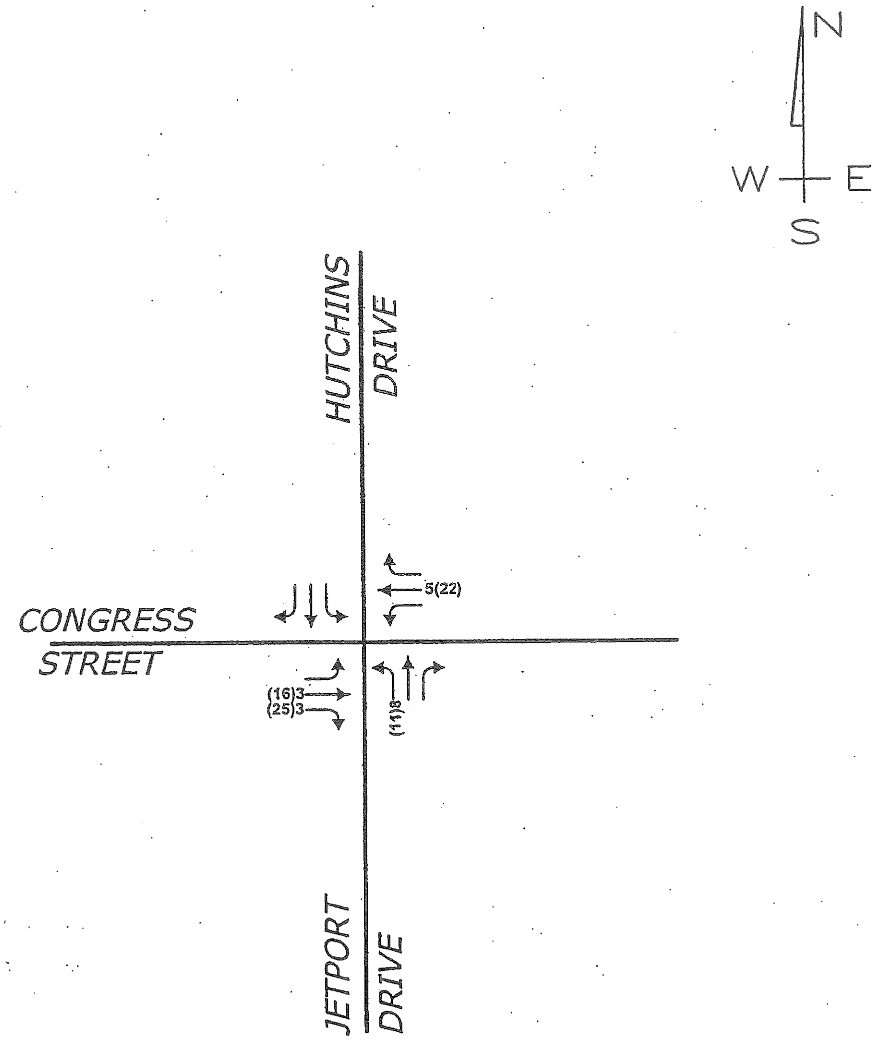
Design: PDO
Draft: ZRJ
Checked: JJB

Date: MONTH 2006
File Name: 1495-TRAF.dwg

Other Development - PM Peak Hour

Figure No. 6



OTHER DEVELOPMENT INCLUDES:
DUNKIN DONUTS: XX
CINEMAGIC: (XX)

PROPOSED EXPANSION - WOODARD AND CURRAN, PORTLAND, MAINE

GP Gorrill–Palmer Consulting Engineers, Inc.
Traffic and Civil Engineering Services

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www.gorrillpalmer.com

Design: PDO
Draft: ZRJ
Checked: JJB

Date: MONTH 2006
File Name: 1495-TRAF.dwg

The applicant has outlined concerns with the previous suggested condition along these lines (included as xii in the Report)(Attachment IV E page 5) and this memo includes a revised suggested condition.

Soils and Drainage

Previous concerns with the possible need for extra curbing, erosion control measures and underdrains have been addressed, as confirmed by the DRC Jim Seymour in his review of 3.8.2006 (Attachment IV D). The applicant submitted an Erosion and Sedimentation Control Plan and Plan (Attachments IV A e and IV I d respectively) and these have been included in a suggested condition in view of the sensitivity of the site.

Fire

The Captain Greg Cass of the Fire Department originally requested an additional hydrant be provided along the internal access road. After further discussions with the applicant regarding the distance from the existing hydrant, this requirement has been removed (Attachment IV H).

City Infrastructure

The applicant has extended the existing sidewalk along Hutchins Drive in accordance with Ordinance 25 (requirement for sidewalks and curbs along the frontage). The applicant has formally requested a waiver for curbing along Hutchins drive in the latter of 2.23. 2006 from Ken Volock which argues that waiver conditions 4 (*"strict adherence to the curb requirement would result in the loss of significant site features related to the landscaping or topography that are deemed to be of a greater public value"*) and 5 *("runoff from the development site or within the street does not require curbing for stormwater management")* have been met. The City Engineer, Eric Labelle, supports this waiver as he does not recommend the installation of granite curbing in this location (see Report). Details of the sidewalk need to be submitted and to be in accordance with City Standards.

The City of Portland has a 10inch sewer main running through the site within a 30 foot easement. The applicant proposes to relocate the sewer and easement to the north so that so that it does not run beneath the proposed building. The diverted sewer is proposed to be 15 feet from the new building addition, centered within a 30 foot easement. The City Engineer has confirmed that there may be other uses, such as a water main, within the sewer easement as long as they remain a minimum of 10 feet from the sewer main (Attachment IV C).

Easements

Progress has been made regarding the easements required for this site as follows:

a. The applicant is preparing language for the sewer and drainage easements (confirmed in letter of 3.9.2006 (Attachment IV E) and the City Engineer requests a second drainage subsurface detention structure and vegetated swale, and the Erosion and Sedimentation Control Plan (including Plan C200) submitted February 23, 2006.

v. The applicant shall present the sidewalk, drainage and sewer easements for final review and approval by Corporation Counsel, including evidence of an appropriate easement in relation to the water main blow-off valve discharge pipe.

vi. The applicant shall submit details of the sidewalk extension and sewer diversion, which must be in accordance with the City Standards and directly reviewed and approved by Public Works.

vii. The applicant to adhere to the submitted Geotechnical Report during construction and involve a Geotechnical Engineer at regular intervals during the construction of foundations and retaining walls; also to amend the plans to reference the construction measures required for such foundation and retaining wall construction. The final retaining wall design shall be designed by a professional engineer and reviewed and approved by the code enforcement officer.

viii. The applicant shall discuss and agree an alternative treatment of the central area of the turning circle at the main entrance with the City Arborist.

ix. That in view of the sensitive nature of this site and its proximity to wetland areas, as a condition of this approval there shall be no further expansion or development of parking areas or commercial space outside of the existing building footprint or impervious surface areas approved herein.

2. That the Planning Board waives the Technical Standard (Section III 2 A.(b), which requires a 24 foot wide driveway for two-way ingress and egress, to allow the driveway alongside the proposed new building (excluding where it meets Hutchins Drive) to be 20 feet wide in order to minimize impact on the nearby wetland area.

3. That the Planning Board waives the Technical Standard set out in Ordinance Sections 14-498 and 14-499 which requires granite curbs, as curbing along the frontage of this site would result in the loss of landscaped swales, and runoff does not require curbing for stormwater management.

(Attachments on next page)

Attachment IV - A

WOODARD & CURRAN
Engineering • Science • Operations

CORPORATE OFFICES: Maine, Massachusetts, New Hampshire, New York, Connecticut, Florida
Operational offices throughout the U.S.

February 23, 2006

Jean Fraser
City of Portland
389 Congress Street
Portland, ME 04101

Re: Woodard & Curran Building Addition
Major Site Plan Review - Additional Information

Dear Jean:

On behalf of the joint applicants, CADCAM Associates and Peggy and Eric Cianchette, we are submitting 10 copies of additional information in support of the Major Site Plan Application for the Woodard & Curran Building Addition, originally submitted September 21, 2005, to be used in Planning Board review.

These documents were prepared in accordance with Chapter 14, Land Use, of the Code of Ordinances of the City of Portland, Maine, and meet the applicable sections of the City of Portland, Maine, Technical and Design Standards and Guidelines adopted September 1987, last amended March 2000.

The information that follows includes updated plans and addresses comments that have arisen from our continued discussion of this project with City staff and with the Maine Department of Environmental Protection (MeDEP), in a memo received from Jim Seymour, Sebago Technics, on January 31, 2006, and comments submitted by the City's Traffic Engineer, Tom Errico, Wilbur Smith Associates, on January 31, 2006. Specific to issues we have discussed:

- We are requesting a waiver from the requirement set forth in Sec 25-96 requiring curbing on Hutchins Drive along the length of our property. Currently, Hutchins Drive is constructed without catch basins or a piped drainage system. Instead, drainage is provided through ditching on either side of the road. If curbing were to be installed along the property's road frontage, there would be significant negative impacts to drainage along this portion of Hutchins Drive; therefore, the project meets City Ordinance of Section 14-506 (b), condition 4 for curbing because "[s]trict adherence to the curb requirement would result in the loss of significant site features related to [...] topography that are deemed to be of a greater public value." Further, the project meets City Ordinance of Section 14-506 (b), condition 5 for curbing because "[r]unoff from the development site or within the street does not require curbing for stormwater management." The project meets two conditions and therefore is eligible for a waiver of the curbing requirement.

- Captain Greg Cass of the Portland Fire Department added the provision of a fire hydrant along the access drive to his comments dated September 28, 2005. He states that the hydrant is needed to ensure there is a hydrant every 500 feet. There is an existing hydrant located next to the main entrance to the building. Every face of the building can be reached in less than 500 feet from the hydrant. An additional hydrant is not necessary to meet the 500 foot requirement and is not proposed as part of the project. We have unsuccessfully attempted to contact Captain Cass to resolve the matter and understand that the Planning Department has also attempted to reach Captain Cass.

- An evaluation has been done to examine alternatives to the proposed project, the impacts of the proposed project on natural resources on the parcel, and ways in which those impacts may be minimized. The evaluation has been attached to this submittal in the form of a memorandum from Woodard & Curran to the Maine Department of Environmental Protection, dated February 22, 2006.

The following responses address comments provided in the memo received from Jim Seymour, Sebago Technics, on January 31, 2006. Our responses have been organized in order of the comments provided.

<u>Stormwater Management</u>

<u>*Comment:*</u>

Our review of the quality calculations revealed that the treatment factors utilized for wooded buffer treatment appear not to be correctly sized and incorporate the use of wetlands, which are not allowed. This affects the overall treatment value, which may reduce the effective sediment removal and not meet the sliding scale factor as declared by the engineer. The engineer must re-evaluate the treatment factors for our or staff review.

<u>Response:</u>

Based on conversations with the City's DRC and with the stormwater review engineer for the Maine Department of Environmental Protection (MeDEP), treatment factors have been reassessed for the Filtration Basins. The stormwater quality calculations have been rerun using a TSS removal factor of 90% for the basins. A dry swale has been added off the end of the rear parking lot to treat runoff from the access road and the rear parking lot. Through the Filtration Basins and the dry swale, the Sliding Scale TSS removal standard (45% for this project) can be achieved without the use of buffers.

<u>*Comment:*</u>

As attempted all buffers shall be shown on the site plan with labels indicating the width, slope, and percentage of removal efficiency for each buffer shown.

<u>Response:</u>

As stated above, the use of buffers has been eliminated from the project.

<u>*Comment:*</u>

All structures such as manholes, catch basins, and drainage structures with surface openings must label rim elevations.

<u>Response:</u>

Sheet C202 Proposed Utility Plan has been revised to indicate rim elevations for all structures.

<u>*Comment:*</u>

The curbing along the access driveway/road along the addition should be extended to discourage scouring at the pavement edge. Therefore, we recommend curbing be extended to the edge of sidewalks at the entrance. The curbing from the building's end sidewalk shall be extended from the circle as well.

Response:

Curbing along the access drive has been extended toward the entrance where the road curves and runoff velocities are expected to be higher. No curbing is proposed where the drive takes a straight course, in order to encourage some amount of filtering as runoff passes through the landscaped area. These changes can be seen on Sheet C201 Proposed Site Plan.

Comment:

The internal parking lot islands must be curbed in the satellite lot, for protection of landscape features.

Response:

Internal parking lot islands in the northerly parking lot have been designed without curbing in order to break up drainage pathways and facilitate some amount of filtering as runoff passes through landscaped areas.

Comment:

Will the underground detention/storage require an underdrain due to the depth in poor clay silt soils where water tables could be high?

Response:

A boring in the area of the proposed subsurface detention structure indicated saturated soils at an elevation of approximately 38 feet. The base of the detention structure will be at 40, providing two feet of separation from the water table. Additionally, the subsurface detention structure will be constructed over a geogrid placed directly on existing soils. The primary outlet is located at the base of the structure; therefore no build-up is expected and no underdrain is proposed.

At the request of the MeDEP, additional test pits were dug by S.W. Cole Engineering in the locations of the proposed filter basins and the dry swale to ensure that a one foot separation could be achieved between the filter layer and seasonal high ground water. The borings indicated that the separation could be achieved, but the test pits were required for confirmation. The summary of the findings is included with this submission in the form of an email to Woodard & Curran, dated Wednesday, February 8, 2006.

Road Access/Circulation

Comment:

Please refer to comments from the City Traffic Engineer for concerns of traffic movements, trip generation, and internal movements.

Response:

Comments from the City Traffic Engineer are addressed below.

<u>*Comment:*</u>

[excerpt] The width of 20 feet is marginal, and it is clear 24 feet width is desirable. Based on the layout and spacing between the proposed structure we feel 22 feet may be completed with a compromise of 1 foot towards the building and 1 foot towards the wetlands, with the access road from the proposed building's Hutchins Drive end to the curb cut designed to be 24 feet not 22 feet. Final discussion, arguments, and impacts will have to be weighed by the Board. Our feeling is that at a minimum, both the City and applicant, to accomplish and improvement for safety and vehicular passage can make a compromise for a 22-foot road.

<u>Response:</u>

Based on our understanding of discussions involving City Planning staff, Public Works and the City Traffic Engineer, we continue to request a waiver from the 24-foot wide access drive standard. The 20-foot wide access drive provides for vehicular and pedestrian safety, provides fire access, and minimizes wetland impact.

<u>*Comment:*</u>

Details are needed for the sidewalk section along the street frontage and shall be in accordance with City of Portland design standards.

<u>Response:</u>

A detail showing typical sidewalk construction in accordance with City design standards has been added to Sheet C301.

<u>Utilities</u>

<u>*Comment:*</u>

Letters to serve and available capacities have been requested showing that adequate service exists for the development. To date those have not been administered by Public Works.

<u>Response:</u>

Our office has had several conversations with Frank Brancely, City of Portland Public Works, regarding sewer collection capacity for the project. Mr. Brancely has assured us that a response is forthcoming. The response will be forwarded upon receipt.

<u>*Comment:*</u>

The City wastewater division and City Engineer shall assist review of the construction details and location of the re-located interceptor sewer. We did not receive plans or construction details for the sewer relocation plan or profile design. All designs must be in accordance with City details, and the City must accept relocated easements. This should be directly reviewed by Public Works, but we can assist is so directed.

Response:

Rim and invert elevations have been added for the proposed sewer relocation on Sheet C202 Proposed Utility Plan. Due to the small amount of sewer design involved, profiles have not been included. It is our understanding the sewer layout and proposed easement have been reviewed and found acceptable by City of Portland Public Works; we will continue to work with Public Works as we finalize construction documents.

Comment:

There is a 12 inch steel culvert shown outleting into the stream from either Hutchins Drive or the Water District easement. Please place an easement around this drainage pipe such that either the City or Water District has rights to maintain on private property.

Response:

The 12-inch steel pipe in question is connected to a blow-off for the Portland Water District (PWD) 42-inch water main and is located on land that is unaffected by the proposed development. The PWD is currently investigating whether an easement is required for this pipe. The Applicants will grant an easement if required by the PWD for the 12-inch steel pipe; however, the pipe does not have any bearing on the project as proposed.

Grading & Erosion Controls

Comment:

The applicant should consider stabilized entrances when building the parking lots and access drives. Notes shall be added addressing mud tracking, pavement cleaning, dust control, and or street sweeping during construction.

Response:

In order to address erosion and sedimentation control, Sheet C200 Erosion and Sedimentation Control Plan, has been added to the drawing set. Stabilized construction exits have been added and erosion control notes during construction have been included. Additionally, a Notice of Intent (NOI) to comply with the Maine Construction General Permit has been filed with the MeDEP Site Law Minor Amendment. The NOI is accompanied by a written Erosion and Sedimentation Control Plan. Although the MeDEP will send a copy to the City, copies of the NOI and the Erosion and Sedimentation Control Plan have been included with this submission.

Comment:

All existing and proposed catch basins in or near the construction area shall be protected with Silt sacs until the base course of paving is completed for the project.

Response:

We are proposing to protect existing and proposed catch basins using straw bale sediment barriers rather than Silt sacs. Information related to the protection of existing and proposed catch basins has been added to Sheet C200 Erosion and Sedimentation Control Plan and a catch basin protection detail has been added to Sheet C303 Civil Details – 4.

General

Comment:

The project has an attached Geotechnical report, which shall be adhered to during construction. The plans shall add a note referencing the construction measures required for such foundation and retaining wall construction. The final retaining wall design shall be designed by a profession engineer, and reviewed and approved by the code enforcement officer. It also may be beneficial to require weekly reports from a geotechnical engineer or geologist summarizing findings and construction monitoring during excavation and preparation of the retaining walls and building foundations.

Response:

The Geotechnical Report shall be adhered to in preparing final design of the proposed project. Additionally, a copy of the report will be included in the construction specifications. S.W Cole will be enlisted to review final design documents to ensure the recommendations presented in the Geotechnical Report have been met as applicable. Construction monitoring and testing will be incorporated into the final construction documents.

Comment:

The applicant is likely required to file a revised Maine Construction General Permit for this project. This must be obtained prior to the start of construction. Additionally the applicant shall indicate on the drawings a construction elevation benchmark with the datum specified. Ideally this should be in accordance with City datum for sewer project work. Please contact Bill Clark at public Works to confirm Survey information requirements.

Response:

An NOI to comply with the Maine Construction General Permit has been filed with the MeDEP Site Law Minor Amendment. Following procedure, the MeDEP will send a copy to the City.

The plans indicate a benchmark in Utility Pole #3.5 between the main entrance to the site and the entrance to the north parking lot. The original survey references the existing site as the vertical datum. We are currently working with Bill Clark to locate a nearby City benchmark to determine the relationship between our vertical datum and the City standard, NVGD 29.

Comment:

The applicant has appears to have available space for development, but given resource protection limits, treatment measures requiring avoidance of snow storage, and given the extent of parking, snow removal is of some concern. Please provide on a plan to address snow storage locations on site or note on the site plan how it will be removed.

Response:

Snow storage areas have been added to Sheet C201 Proposed Site Plan.

The following responses address comments provided to the Planning Department by the City Traffic Engineer on January 31, 2006. Our responses have been organized in order of the comments provided.

Comment:

The internal roadway providing access to the 43-space parking lot to the rear of the building will not meet general City roadway width standards. The roadway is proposed to be 20 feet. I support a waiver for the roadway width in light of the increased environmental impact a wider facility would have. It will be extremely important that good winter maintenance practices are followed to ensure that the effective width is not reduced due to snow accumulation.

Response:

Snow removal from the access drive has been discussed above. The 20 foot driveway width will be maintained; no snow storage is proposed for along the roadside.

Comment:

The driveway "throat" at the Hutchins Drive entrance is currently proposed to be approximately 22 feet. The driveway should be modified such that it is 24 feet wide.

Response:

The width of the driveway entrance at Hutchins Drive has been increased to 24 feet.

Comment:

The applicant should provide details on the traffic control/pavement markings at the internal intersection at the main entrance.

Response:

Pavement markings at the intersection near the main entrance have been added to Sheet C201 Proposed Site Plan.

Comment:

I have reviewed the proposed parking supply and it is my professional opinion that the parking provisions are reasonable. Under the current proposal, a total of 167 parking spaces will be provided. At the time of project completion, 143 employees can be expected to occupy the facility. Under a full occupancy scenario 207 employees can be expected. A review of parking generation information provided by the Institute of Transportation Engineers indicates approximately 164 parking spaces are required for an office building with 207 employees. Accordingly, I find the supply to be adequate and not excessive.

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Response:

In an effort to minimize wetland and stream impacts, we have reduced the number of proposed total parking spaces to 164.

Comment:

Gorrill-Palmer Consulting Engineers, Inc. provided information on the permitting aspect of developments along Hutchins Drive. Based upon the information provided, I concur that a MaineDOT Traffic Movement Permit is not required for the project. However, based upon traffic increases since 1997, I would ask that the applicant conduct an analysis of the Congress Street/Hutchins Drive intersection during the weekday AM and PM peak hours to ensure safe and reasonable operations will be provided following completion of the project.

Response:

Gorrill-Palmer Consulting Engineers, Inc. has conducted the requested analysis of the intersection of Congress Street and Hutchins Drive. Findings are attached to this submission and have been forwarded directly to the City's Traffic Review Engineer.

Thank you for the assistance you have provided thus far. We look forward to continuing our work with your office and the Planning Board on this project. If you have any questions or comments, please do not hesitate to contact me at (207) 797-7515, or via email, kvolock@woodardcurran.com.

Sincerely,
WOODARD & CURRAN INC.

STATE OF MAINE
KENNETH R. VOLOCK
NO. 11062
REGISTERED PROFESSIONAL ENGINEER

Kenneth Volock
Engineer

KRV/djt
203834.01

Enclosures: Drawings, including:
- Cover
- G001 General Notes, Legend, Abbreviations and Sheet Index
- C100 Existing Site Plan
- C200 Erosion and Sedimentation Control Plan
- C201 Proposed Site Plan
- C202 Proposed Utility Plan
- C300 Civil Details - 1
- C301 Civil Details - 2
- C302 Civil Details - 3
- C303 Civil Details - 4

Alternatives Analysis and Impact Minimization memorandum from Woodard & Curran to the Maine Department of Environmental Protection, dated February 22, 2006

Stormwater Management with attachments, revised February 22, 2006

Findings of February 8, 2006 test pits in the form of an email to Woodard & Curran, dated Wednesday, February 8, 2006

Notice of Intent to comply with the Maine Construction General Permit

Erosion and Sedimentation Control Plan: Woodard & Curran Office Expansion

Letter from Gorrill-Palmer Consulting Engineers, Inc. to Mr. Tom Errico, P.E., dated February 22, 2006

IV - A - a

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CORPORATE OFFICES: Maine, Massachusetts, New Hampshire, Connecticut, Florida.
Operational offices throughout the U.S.

MEMORANDUM

STATE OF MAINE
KENNETH R. VOLOCK
NO. 11062
REGISTERED PROFESSIONAL ENGINEER

TO: Maine Department of Environmental Protection

FROM: Kenneth Volock, P.E.

DATE: February 22, 2006

RE: Woodard & Curran Office Expansion – Alternative Analysis and Impact Minimization

This memorandum is written in support of our Permit by Rule (PBR) Notification for the above referenced project. The project involves the construction of an addition to the office building currently located on the parcel, an expansion of existing parking lots, and associated utility improvements.

The parcel is currently occupied by the offices of Woodard & Curran, with 111 employees located in two connected buildings. Woodard & Curran also has 32 employees located in leased space on the adjacent parcel on Hutchins Drive. The purpose of the project is to allow Woodard & Curran to bring its employees into interconnected buildings and to allow for growth within that expansion. Sheet C100 Existing Site Plan, Sheet C201 Proposed Site Plan and Sheet L-1.0 Landscape Plan have also been included within this submission.

The parcel contains a central wetland area with a small unnamed brook passing through it. Another smaller brook runs along the easterly edge of the parcel. Layout of the proposed development has been designed to avoid natural resource impacts to the maximum extent practicable and protect remaining buffers and the resource. As is shown on Sheet C100 Existing Site Plan, there is little area available on the parcel outside the 75-foot setback from either resource that has not already been developed. In order to provide the building expansion and necessary related infrastructure, development within the 75-foot setback is required.

ALTERNATIVES ANALYSIS

In an effort to reduce impacts to the resource, we looked at four alternatives for the project. These are:

1. No project
2. Avoidance
3. Alternate Location of Building Addition
4. Alternate Location of Parking

No Project

One alternative to this proposed project is no-change, i.e., maintain the existing buildings and no expansion. Unfortunately, this alternative would not allow the company to centralize its staff or allow for any growth and would likely force the company to relocate its offices.

Avoidance

As stated above, there is little area available on the parcel outside the 75-foot setback from either resource. Complete avoidance of development within the 75-foot natural resource setbacks would not allow the level of development required by the Applicant to remain in their current location. We have made several attempts to avoid impacts to the resource by locating parking facilities outside resource setbacks, as can be seen on the site plan and in the Alternative Location of Parking narrative below.

Alternate Location of Building Addition

Woodard & Curran considered siting the building on the south side of the existing buildings. Unfortunately, siting the building there would create two subterranean levels, or a wing that is one or even two stories higher than the rest of the building. Such a building would be out of character with the campus feel and may also present setback problems. This layout would have displaced all of the parking in the south lot and required the same amount of expanded rear parking as is currently proposed.

Woodard & Curran also considered siting the building on the east side of the parcel, in the location currently occupied by the rear parking lot expansion. This orientation would have required that the first story be partially enclosed parking, reducing the allowance for growth in the expanded facility. The partially enclosed parking also would have represented a significant increase in cost of the project. Emergency access to the rear of the buildings would have required a more significant natural resource impact than in the current proposed layout.

With the presented layout, the Applicant will be creating a campus-type setting for the three wings of the building, each accessible by a common central plaza. The common plaza reduces the amount of paved surface on the project site by providing a shared amenity for the three buildings. Upon completion, the building addition will have a similar look and feel to that of the existing North Wing, to which it will be adjacent. Floor elevations have been coordinated to match the adjacent buildings, allowing free-flow of office personnel.

Alternate Location of Parking

Other areas were considered for development for additional parking during planning for the proposed project. One area was between the existing southerly parking lot and the south wing. This area is currently grassed and falls away from the parking area toward the building. It is crossed by a bridge to the second floor of the south wing. A sketch of how parking could be added in this area had been previously submitted to the City of Portland and to the Department as Figure 1 in Section 5 Off-Site Facilities. In order to develop this area for parking, a significant amount of fill material would be required. Further, there is not enough room between the parking area and the south wing to fit both a driveway and parking spaces. The current configuration would need to be altered to that shown in the sketch. Approximately 4,500 square feet of paved area would need to be added and the parking would result in a net increase of 5 spaces, from 26 to 31; this area does not present a more practicable option for expanded parking.

Another area considered is the wooded area in front of the south wing, between the building and Hutchins Drive. An initial sketch of how parking could be added in this area had been previously submitted to the City of Portland and to the Department as Figure 2 in Section 5 Off-Site Facilities. Some fill material would need to be brought in for this area as well. This area would require a similar amount of additional pavement as the scenario depicted in Figure 1, but could provide approximately 16 additional parking spaces. We initially determined this scenario was undesirable as depicted; clearing of the existing wooded area and opening the south wing up to Hutchins Drive would be in sharp contrast to what has been attempted over the rest of the site in providing necessary parking behind buildings or otherwise buffered with landscaping to the extent practicable.

As a result of discussions with the Department, relocation of parking to the area in front of the South Wing has been reconsidered. A portion of the area proposed for site parking has been shifted from within the 75-foot brook setback to an alternate location on the southerly portion of the parcel, near the entrance to the south parking lot. In the revised layout, currently depicted on Sheet C201 Proposed Site Plan, 11 parking spaces have been eliminated from the rear parking lot and 8 have been added along the entrance to the south lot. By relocating the spaces to the south lot, the total number of parking spaces for the site has been reduced from 167 to 164. We consider 164 the minimum acceptable number of parking spaces to meet the project need, and is consistent with the City's reviewing traffic engineer's opinion based on Institute of Transportation Engineering parking generation information.

The access drive is the only access to the rear parking and also provides emergency access to the rear of the building. Access from the north would require crossing the unnamed brook (in the center of the parcel). Access from the south, around the existing buildings, would require construction within 25 feet of the small brook along the easterly edge of the site. As such, no alternative is available for the location of the access drive.

NATURAL RESOURCE IMPACT

On the main area of the parcel, where the building and adjacent parking is located, a portion of the proposed access driveway, totaling approximately 1,000 square feet, is located within the 25-foot setback from the wetland. However, this area is outside the 25-foot setback from the brook. Based upon discussions with the City and a desire to reduce impact from the access drive, we have requested a waiver from the City from its 24-foot wide driveway standard to the 20-foot wide driveway proposed.

As a result of discussions with the Department, we have shifted a portion of the rear parking lot expansion to within the 25-foot wetland setback near the easterly edge of the parcel. The purpose of this revision was to get a far as possible from the unnamed brook (in the center of the parcel). Although the parking area is within the 25-foot wetland setback along the easterly edge of the parcel, it does not sit within the 25-foot setback from the smaller brook (at the easterly edge of the parcel).

On the northern portion of the parcel, where the parking lot expansion is proposed, a small area of wetland fill, totaling approximately 50 square feet, is proposed. As this area is greater than 100 feet from the brook, it is our understanding that no additional permitting is required for this small fill area.

MINIMIZATION OF IMPACT

Impacts to the natural resources will be minimized during construction through the use of temporary measures such as sedimentation berms and siltation fencing, a stabilized construction exit, and catch basin inlet protection. A Notice of Intent to comply with the Maine Construction General Permit has been filed for the project. An Erosion and Sedimentation Control Plan has been prepared to describe the proposed measures. Both have been included with this submission.

Permanent measures to protect the remaining buffers and the resource will include pavement, seeding of disturbed areas that will not be paved or built upon, trees, shrubs and other plantings, and soil reinforcement where applicable. Treatment of stormwater runoff will be accomplished prior to its discharge into the natural resources through filtration and detention. Runoff from the roof of the building expansion will pass through a subsurface detention structure. Runoff from the proposed expansion to the north parking lot will pass through a filter basin. Runoff from the access drive and the expansion to the rear parking lot will be filtered through a dry swale.

CONCLUSION

The Applicant is working with the MeDEP in developing the proposed project in as environmentally sensitive a manner as practicable. To this end, construction impacts to natural resources will be minimized through the use of sedimentation berms and siltation fencing, a stabilized construction exit, and catch basin inlet protection during construction. Permanent erosion control measures include pavement, grass, trees, shrubs and other plantings, and soil reinforcement blankets where applicable.

The Applicant has incorporated alternative location to certain site elements presented herein to the extent possible. The project as proposed represents the most practical, cost effective and reasonable alternative that satisfies the purposes and needs of the proposed project. There is no practicable alternative based on cost, existing technology and overall purpose of the project.

If you have any questions or require further information, please contact me at (207) 774-2112, or via email at kvolock@woodardcurran.com.

KRV/
203834.01

STATE OF MAINE KENNETH R. VOLOCK NO. 11062 REGISTERED PROFESSIONAL ENGINEER

IV-A-b

6. STORMWATER MANAGEMENT

6.1 OVERVIEW

The proposed project consists of the expansion of the existing offices of Woodard & Curran at 41 Hutchins Drive in Portland. The project involves the construction of an addition to the office building currently located on the site, an expansion of an existing parking lot, and the relocation of a City of Portland sewer main and its associated easement.

The site consists of two parcels of land, lots #15 & #16 of the Stroudwater Estate Subdivision, owned by CAD-CAM Associates and located at 41 Hutchins Drive. These lots occupy a total area of approximately 6.65 acres. As stated earlier, the site is occupied by an office building with a footprint of 13,232 square feet (approximately 0.3 acres). Other impervious areas on the site include parking lots, paved driveways and walkways which combine to make up 50,170 square feet (approximately 1.15 acres) of paved area.

6.2 SITE CHANGES

The proposed building addition will be a three-story structure with a building footprint of approximately 7,560 square feet, with a direct link to the existing North Wing. Other changes to the site include: an addition to the parking lot on the northerly portion of the site; an increase in parking at the rear of the building; the new access drive to rear parking areas; and the redesigned plaza and walkway in the center of the campus. The total increase in paved area is 24,881 square feet. In total, the proposed project will increase site imperviousness by 32,441 square feet (approximately 0.74 acres) to 95,843 square feet (approximately 2.2 acres).

Table 6.1 below indicates the changes in impervious area within the upland portions of the site as a result of the proposed project:

Table 6.1: Site Impervious Area Summary

	Total Site Area (acres)	Impervious Area (acres)	Percent Impervious (%)
Pre-Development	6.65	1.46	21.9
Post-Development	6.65	2.20	33.1
CHANGE	**0.00**	**0.74**	**11.2**

6.3 STORMWATER MANAGEMENT DESIGN

Stormwater runoff from the site ultimately flows to an unnamed brook in a 30-foot wide drainage easement running through the middle of the site. The unnamed brook flows through the easement and makes its way to the Stroudwater River, a little more than a quarter of a mile away.

The Woodard & Curran site falls under the existing Site Location of Development permit for Stroudwater Estates Phase II, L-010223-99-A-A. As a condition of that permit, peak discharge from the site must be controlled. Therefore, the project has been designed to prevent an increase in peak runoff from the site.

6.3.1 Existing Stormwater Management

The existing building roof drains, a portion of the adjacent parking area to the north, and the adjacent open space to the east collect in a small pond designed to reduce peak discharge rates. Runoff is discharged from the pond through a 6-inch diameter PVC pipe into a wooded area and flows to the brook. The remainder of the adjacent parking area to the north is graded such that stormwater runs off overland into wooded areas and toward the brook. Runoff from the area between the existing building and Hutchins Drive, including the main entrance drive to the building, is collected in a catch basin and piped toward the brook.

The parking lot on the northerly portion of the site drains into another small pond, also designed to reduce peak discharge rates. The pond contains an outlet structure controlling the inlet of a 12-inch corrugated polyethylene culvert. The culvert discharges to a riprap apron and then flows to the brook. The area above the parking lot to the north and west is graded such that runoff is diverted to a ditch along Hutchins Drive and then into the brook through a 48-inch concrete culvert under Hutchins Drive. Runoff from the undeveloped portion of the site, east of the northern-most parking lot, flows over land directly to the brook.

6.3.2 Proposed Stormwater Management

Runoff from the area between the building and Hutchins Drive, including the main entrance drive to the building, will continue to be collected in a catch basin and piped toward the brook. The existing portion of the satellite parking lot and the area above it to the north and west will drain as in the existing condition. Runoff from the access lane and the existing parking area adjacent to the North Wing will be collected in a catch basin, which will empty into a ditch running to a dry swale, then through existing wooded buffers and toward the brook. The proposed expansion to parking at the rear of the buildings will not be collected, but rather drain overland into the same dry swale.

The roof drains from the entire building will be collected and piped to a subsurface detention structure, similar to the Rainstore product by Invisible Structures, Inc. The detention structure will be located under the parking lot adjacent to the existing North Wing, and will be approximately 60'x50' in area and 2 feet deep. Product cut sheets for the Rainstore product have been included in this section.

According to Invisible Structures product literature, the Rainstore product has 94% void space, providing 2,820 square feet of effective area in the subsurface detention structure. The primary discharge is through a 4-inch culvert at the bottom of the structure (invert elevation 40.0'), detaining flow during the larger storms. A secondary discharge is provided in the form of a 12-inch culvert set one foot above the base of the structure (invert elevation 41.0'). The structure is modeled as Pond 23 in the Post-Development Stormwater Model (see section 6.3.3.2 and the attached HydroCad data). The detention structure will discharge toward the brook.

On the northerly portion of the site, the proposed addition to the northerly parking lot will be collected and treated in two underdrained filter basins. Each basin will drain either through the underdrain or over a spillway and into the brook. The area above the proposed expansion to the north will be diverted to the brook to the east without being collected in either basin.

6.3.3 Stormwater Quantity Calculations

The intent of this section is to address the effects of site runoff from a proposed development project on the local watershed. The stormwater modeling presented herein compares the existing site conditions with the proposed site conditions (existing and proposed).

Stormwater modeling was done using the HydroCAD Stormwater Modeling System by Applied Microcomputer Systems. HydroCAD uses TR20 runoff calculation methodology. The computation sheets resulting from the models are attached at the end of this section.

The runoff curve numbers (RCN) for the subcatchments have been computed using the TR55 methodology. The subcatchments were divided based on land use and acreage measurements were used to compute a weighted (composite) RCN.

The time of concentration (Tc) paths for the subcatchments were selected to represent the most hydrologically remote point of the watershed. The Tc paths are shown respectively on the Pre-Development and Post-Development Stormwater Plans. Note that the Tc computations contain time calculations using TR55 sheet flow, shallow concentrated flow equations, and circular channel (pipe).

Soils information used in the computations was obtained from the Soil Survey of Cumberland County, Maine, USDA Soil Conservation Service (SCS Survey). The project site is located in an area of Elmwood and Scantic soils. The Elmwood soils are mapped for the generally higher, drier topography of the site, while the Scantic soils are in the lower, wet regions. An interpretation of the delineation between soils was made using the site's wetland mapping. Selection of the hydrologic soil group for computation of runoff curve numbers assumes that the floodplain wetlands mapped for the project are Scantic soil and the remaining non-floodplain areas are Elmwood soil. The Scantic series soil is Hydrologic Soils Group "D" and the Elmwood series soil is Hydrologic Soils Group "C".

For this project, the 2-, 10-, and 25-year return frequency storms of 24-hour duration were analyzed. A Type III rainfall distribution was applied to these storms. The 2-, 10-, and 25-year 24-hour precipitation measurements (3.0 inch, 4.7 inch, and 5.5 inch, respectively) were taken from Appendix D of the BMPs, rather than the values published in the Portland Technical and Design Standards and Guidelines. Through other work in the City of Portland, we have learned that the values published in the BMPs are preferred.

6.3.3.1 Existing Condition

To model the project, the existing site was separated into multiple drainage area subcatchments. Subcatchments 11X, 12X, 13X, 14X, 21X, 22X, 23X and 24X represent the Existing conditions. These subcatchments are depicted in Figure 6.1 attached to this section. Subcatchments 11X through 14X have been numbered generally west to east along the northerly area of the project site, in the vicinity of the satellite parking lot. Subcatchments 21X through 24X depict the southerly area of the project site, in the vicinity of the building.

Reaches 1R, 2R and 3R are located in the middle of the project site and represent the unnamed brook running through the 30-foot wide drainage easement. Reach SP represents the study point in the brook near the eastern edge of the project site for the purpose of quantity modeling.

Ponds P11 and P23 represent existing ponds where runoff is collected from Subcatchments 11X and 23X respectively. Reaches R11, R12, R22 and R23 represent paths by which Subcatchments 11X, 12X, 22X and 23X respectively, are routed through other subcatchments to the unnamed brook.

The Existing Stormwater Plan drawing, Figure 6.1, attached to this section, depicts the subcatchments, reaches, ponds, and time of concentration paths utilized in the model.

6.3.3.2 Post-Development Condition

The proposed site was separated into multiple drainage area subcatchments. Subcatchments 11S through 16S, and 21S through 26S represent the Proposed conditions. These subcatchments are depicted in Figure 6.2 attached to this section. Subcatchments 11S and 12S are similar to subcatchments 11X and 12X respectively. Subcatchments 13S and 14S represent the areas of subcatchments 13X and 14X that are not routed through quality BMPs in the proposed condition. Subcatchments 15S and 16S represent the expansion of the northerly parking lot.

Subcatchment 21S is similar to a portion of subcatchment 21X. Subcatchment 22S is similar to subcatchment 22X, with the addition of a portion of 21X. Subcatchment 23S represents the existing and proposed buildings. Subcatchment 24S and 25S represent the access lane and the existing and proposed rear parking. Subcatchment 26S represents a small area, formerly part of 23X, that runs directly into the woods.

Reaches 1R, 2R and 3R are located in the middle of the project site and represent the unnamed brook running through the 30-foot wide drainage easement. Reach SP represents the study point in the brook near the eastern edge of the project site for the purpose of quantity modeling.

Pond P11 is the same as in the Existing condition. Ponds P15 and P16 represent underdrained filter ponds where runoff is collected from Subcatchments 15S and 16S respectively, and treated. Pond P23 represents the subsurface detention structure where runoff from the roof drains is collected. Pond P24 represents an underdrained dry swale where runoff is collected from Subcatchment 24S and 25S and treated. Reaches R11, R12, R15, R16, R22 and R26 represent paths by which Subcatchments 11S, 12S, 15S, 16S, 22S and 26S respectively, are routed through other subcatchments to the unnamed brook. Reach R25 represents the vegetative swale by which Subcatchment 25S is routed to Pond P24. The discharge from P23 is routed through Reach R23.

The Proposed Stormwater Plan, Figure 6.2, is attached at the end of this section, depicting the subcatchments, reaches, ponds, and time of concentration paths utilized in the model.

6.3.3.3 Summary

Peak runoff values calculated for the Existing and Proposed conditions are listed in Table 6.2 below.

Table 6.2: Runoff Summary

STUDY POINT	PEAK RUNOFF 2 Year (CFS)	PEAK RUNOFF 10 Year (CFS)	PEAK RUNOFF 25 Year (CFS)
Existing Condition	4.92	11.31	14.61
Proposed Condition	4.07	10.62	13.94
CHANGE IN RUNOFF	**-0.85**	**-0.69**	**-0.67**

As shown in Table 6.2 and the appended calculations, runoff from the site is decreased slightly during each storm event. The decrease during the 2-year storm is about 17%, whereas the decrease for the 10- and 25-year storms is only around 6% and 5%, respectively. The decrease during the 2-year storm is greater than the decreases for the 10- and 25-year storms since the runoff from the parking lots detained in the filtration basins and dry swale represents a much more significant portion.

The watershed routing diagram and model output from HydroCAD is attached at the end of this section for both the Existing and Proposed conditions.

6.3.4 Stormwater Quality

Stormwater quality has been addressed on the site through a combination of native and constructed quality treatment measures. Filtration basins will be used to filter runoff from smaller storms and the initial runoff from larger storms in the proposed expansion to the north lot. A dry swale will filter runoff from the access drive and parking lot at the rear of the building addition. The existing portion of the north lot will continue to receive some level of treatment from the existing detention basin.

6.3.4.1 Applicable Standards

The City of Portland Code of Ordinances was reviewed to determine the applicability of local stormwater quality standards. City Code of Ordinances Section 14-526, Subsection (a), Paragraph 20 states, in part, "Stormwater runoff from paved areas shall be treated to the extent practicable to minimize contaminants." Additionally, the City of Portland Technical and Design Standards and Guidelines, Section V, Subsection 3, Paragraph A states that "[a]ll development proposals shall conform to the standards set forth in Chapter 500 of the Maine Department of Environmental Protection Stormwater Management [...] Rules". In the same section and subsection, Paragraph H states "[a]ny parking facility for the equivalent of 25 cars or 10 trucks or greater shall be required to provide for on-site treatment to remove contaminants such as oils, greases, sediments and grits fro the stormwater runoff."

The Maine Department of Environmental Protection (MeDEP) has recently adopted an updated Chapter 500: Stormwater Management. The updated chapter went into affect November 16, 2005. While not required, but because we believe these rules are consistent with our project approach, the project has been designed with these new rules in mind where possible.

Through discussions with the Maine Department of Environmental Protection (MeDEP), we have determined that stormwater requirements for the site are covered by the Site Law permit originally granted to Stroudwater Estates Phase II in 1984. As such, the new Chapter 500 does not apply to the proposed project. An email from Linda Kokemuller with the MeDEP, dated December 16, 2005, has been attached to Section 8 - State and Federal Permitting, providing confirmation. The project need only prevent a post-development peak runoff rate in excess of the pre-development rate.

Through discussions with the City's review engineer, it was determined that some level of stormwater quality treatment would be required, even if the project was not required to meet the new Chapter 500. In discussions with MeDEP, it was determined that their review for runoff quality will include the proposed areas of the site. The City's review engineer agreed that he would be satisfied with water quality if the MeDEP was. Based on these discussions, the treatment measures for the proposed areas of the site were designed to meet the Sliding Scale TSS removal standard, present in the previous Chapter 500 regulations.

Because the project will remain under the coverage of the original Stroudwater Estates Phase II Site Law permit, the site need not meet the BMP Standards set forth in the new MeDEP Chapter 500. However, the expansion to the northern-most parking lot has been designed to meet the BMP Standards in an attempt to create a lower impact design.

In summary, the project is designed to meet the Sliding Scale TSS Removal Standard for the proposed aspects of the site. Stormwater Quality calculations below (see section 6.3.4.3) indicate that the treatment measures for the site will achieve a 54.6% TSS removal rate, which exceeds the 45% required based on percentage of site impervious area. The expansion to the north parking lot is designed to meet the BMP Standard, as described in the recently adopted version of MeDEP's Chapter 500: Stormwater Management. We believe that this meets the requirement to treat "to the extent practicable" as described in the City Code of Ordinances.

6.3.4.2 BMP Assessment and Selection

In Chapter 500: Stormwater Management, the MeDEP suggests four potential treatment methods to comply with the BMP standards:

- Wetponds with detention above the permanent pool,
- Filtration,
- Infiltration, and
- Buffers.

The area required to construct a wetpond to meet the BMP is too great considering the disturbance of forest and wetlands as well as the changes to site topography that would be required. The varied site topography and presence of wetlands prohibits the ability to classify certain areas as buffers. The soils on the site make infiltration difficult, but soils could be brought in to create filtration basins and dry swales, two filtration methods that do not require as much area as wetponds. The types of BMPs that seem most feasible for the site are constructed filtration basins and dry swales.

Due to the location of each proposed element of the project, and in an effort to minimize site disturbance, two underdrained filtration basins are proposed to treat runoff from the proposed expansion to the satellite parking lot. Each basin is sized to detain a volume of runoff equal to one inch times the impervious area that drains to it, plus 0.4 inches times the vegetated area that drains to it. The basins are designed so that storage volume will be less than 18 inches deep. The floor of the basin will be constructed with a soil filter layer capable of passing the stored volume within two days. The soil filter layer will be underlain by a well-drained gravel layer with a perforated underdrain. Filter Basin details have been provided on Sheet C301 Civil Details-2, attached to Section 1.

The dry swale will be located off the northeast end of the rear parking lot, and constructed in accordance with the previous Stormwater BMP sizing requirements. In order to achieve a TSS removal of 69%, the swale will be sized to detain 0.4 inches of runoff over the area that drains to it. As with the filtration basins, the swale is designed so that storage volume will be less than 18 inches deep. The floor of the swale will be constructed with a soil filter layer capable of passing the stored volume within two days. The soil filter layer will be underlain by a well-drained gravel layer with a perforated underdrain. Dry Swale details have been provided on Sheet C302 Civil Details-3, attached to Section 1.

Level spreaders are used wherever stormwater runoff must be converted back into sheet flow before passing into existing wooded buffers. Four level spreaders are proposed: one will be constructed at the outlet of the Filtration Basin 1 underdrain and will also catch flow from the Basin 1 spillway; one will be constructed at the base of the retaining wall near the western end of the access lane and will handle flow from Subcatchment 22S; one will be constructed below the retaining wall near the eastern end of the access lane and will handle discharge from Pond P23;

and the fourth will be located off the northern end of the rear parking area and will handle discharge from Pond P24.

Calculations for the filter basins, the dry swale and the level spreaders can be found attached to the end of this section.

6.3.4.3 Stormwater Quality Calculations

The removal of TSS from the stormwater flows is achieved through the use of filtration basins, a dry swale and an existing detention basin. Through discussions with the City DRC and with the MeDEP, a TSS removal efficiency of 90% was used for the filtration basins. The dry swale has been sized to provide a TSS removal efficiency of 69%. The existing detention basin which collects runoff from the existing portion of the north lot provides 10% TSS removal. All catch basins on site will have water quality inlets which provide an additional 10% TSS, but only if followed by some other treatment measure.

For the purposes of TSS removal calculations, the proposed areas of the site were evaluated. The calculations are based upon worksheets 1, 2 and 3c from Appendix F of the Stormwater BMPs. Net TSS removal was calculated for each subcatchment (or proposed portion of each subcatchment) individually and then the weighted totals were summed.

The constructed water quality measures for the site will yield a net TSS removal of 54.6% for the proposed areas of the site. For a 33.1% impervious site, the Sliding Scale TSS removal standard requires a net TSS removal of roughly 45%; therefore the measures for the site will meet the standard. The individual subcatchment and total site net TSS removal calculations for this project are found attached to this section.

6.4 MAINTENANCE OF STORMWATER SYSTEMS

Upon completion of the project, responsibility for overseeing the property will fall on the Facilities Manager, including the inspection and maintenance of the site's stormwater drainage system, treatment measures, roadways, parking areas, permanent erosion control measures, and landscaped areas located outside of City right-of-ways.

The Facilities Manager will be an agent of the Owner. Until a Facilities Manager has been assigned to the site, the responsible parties will be Peggy and Eric Cianchette, who can be reached c/o ELC, Inc., 42 Market Street, Portland, Maine 04101.

6.4.1 Catch Basins

Catch basins will be inspected semi-annually in spring and fall. These visual inspections ensure the catch basin grate is free of debris and that sediment in the sump has not accumulated above the pipe inverts. If cleaning is required, the Facilities Manager can contract the services of Catch Basin Cleaners [P.O. Box 1579; Meredith, N.H., 03253; (603) 279-3118] or a similar firm.

6.4.2 Parking and Paved Areas

Parking and paved areas will be inspected annually each spring. Visual inspections will enable site roads and parking areas to be kept clean and clear through contracting periodic sweeping and winter plowing as required. The inspections will also ensure pavement markings are repainted as needed to maintain property traffic circulation and parking space delineation. Paved areas will be plowed and sanded as often as necessary to maintain public safety.

The Facilities Manager will inspect all parking and paved areas in the project site and will have the pavement swept and cleaned within the project site on an annual, as-needed basis. This work will be contracted with Zebra Striping, Inc. [101 Pleasant Hill Rd.; Scarborough, ME, 04074; (207) 883-7081] or a similar firm.

6.4.3 Filter Basins and Dry Swales

The underdrained filter basins and dry swales will be inspected semi-annually in spring and fall. Additionally, each basin and swale will be inspected following major storms. These inspections will ensure that there is no erosion in the basin or swale, the basin or swale remains capable of filtering runoff within two days, and sediment does not build up.

MeDEP recommends mowing at least twice each year to allow visual inspection and to prevent the growth of woody plants. At the Woodard & Curran site, each basin and swale will be mowed in conjunction with regular mowing, typically on a weekly basis. Sediment will be removed annually. Any eroding areas will be repaired immediately. Should a basin or swale fail to filter the runoff form a storm within two days, the soil filter layer may need to be retilled. The Facilities Manager would likely hire a local contractor to perform this work.

No basin or swale will be used for snow storage or for any activities that involve heavy foot traffic. Vehicles will not be allowed.

6.5 CONCLUSION

The project has been designed to prevent an increase in peak runoff from the site to comply with the existing Site Location permit. Additionally, in order to provide measurable stormwater quality treatment and to comply with the City Ordinance, the project was designed to meet the Sliding Scale TSS removal standard, present in the previous Chapter 500 regulations. The peak runoff rate will decrease during the 2-year storm by about 17%, and by 6% and 5% for the 10- and 25-year storms, respectively. The water quality measures for the site will yield a net TSS removal of 54.6% for the proposed areas on site, exceeding the 45% required by the Sliding Scale TSS removal standard. As designed, the project will meet both goals.

Some aspects of the recently adopted MeDEP Chapter 500: Stormwater Management have been incorporated into the design of the project. Stormwater filtration basins are proposed for the expanded areas of the satellite parking lot. These basins will collect and filter runoff from smaller storms, and the first flush, which carries the majority of the sediment load, from larger storms.

Upon completion of the project, maintenance responsibility for the site stormwater conveyance and treatment measures will be the responsibility of the Facilities Manager.

6.6 ATTACHMENTS

Rainstore, by Invisible Structures, Inc., Product Detail Sheets

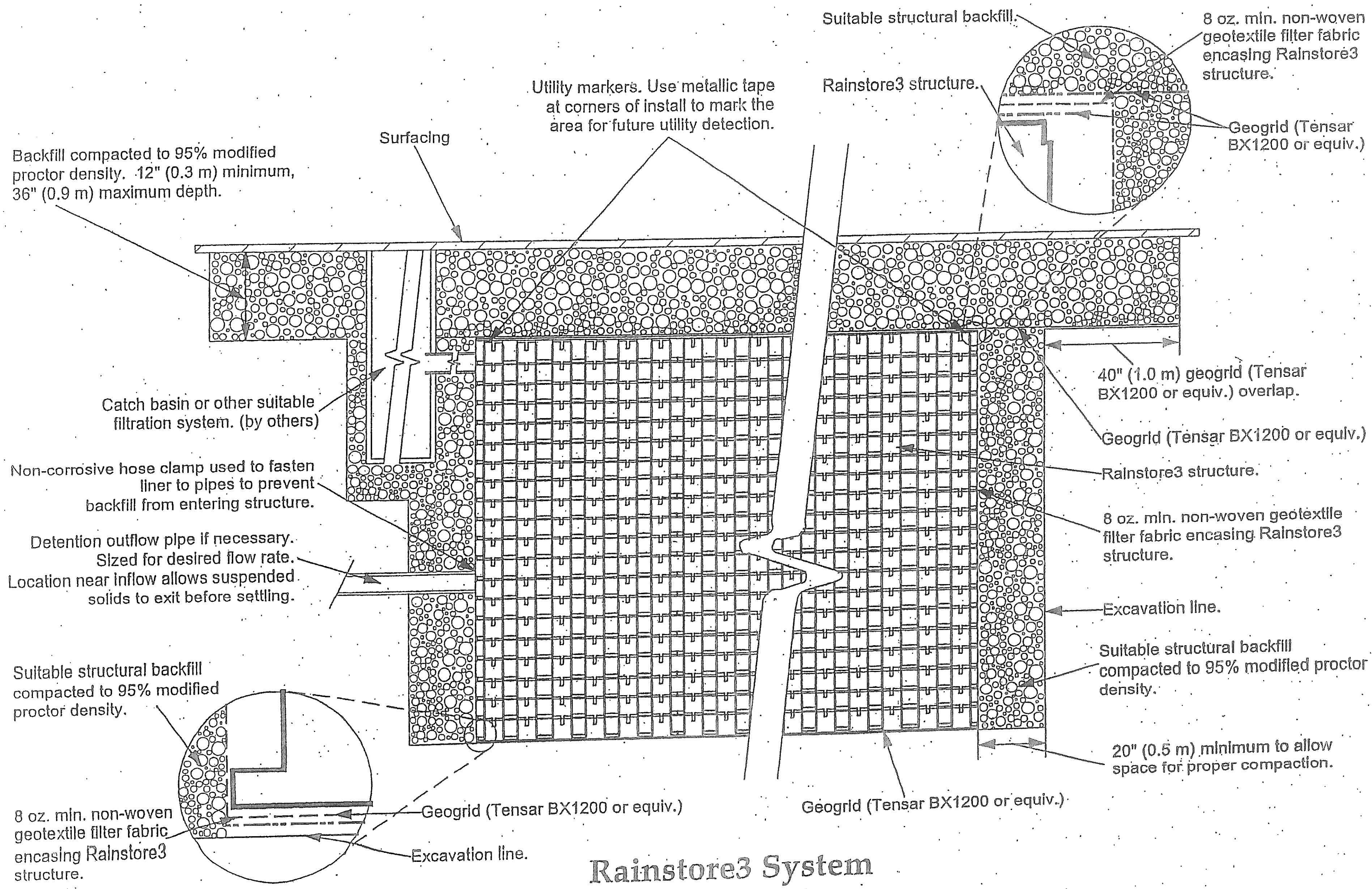
Figure 6.1 – Existing Stormwater Management Plan.

Figure 6.2 – Proposed Stormwater Management Plan.

HydroCAD Calculations (Existing).

HydroCAD Calculations (Proposed).

Water Quality Calculations.



Rainstore3 System

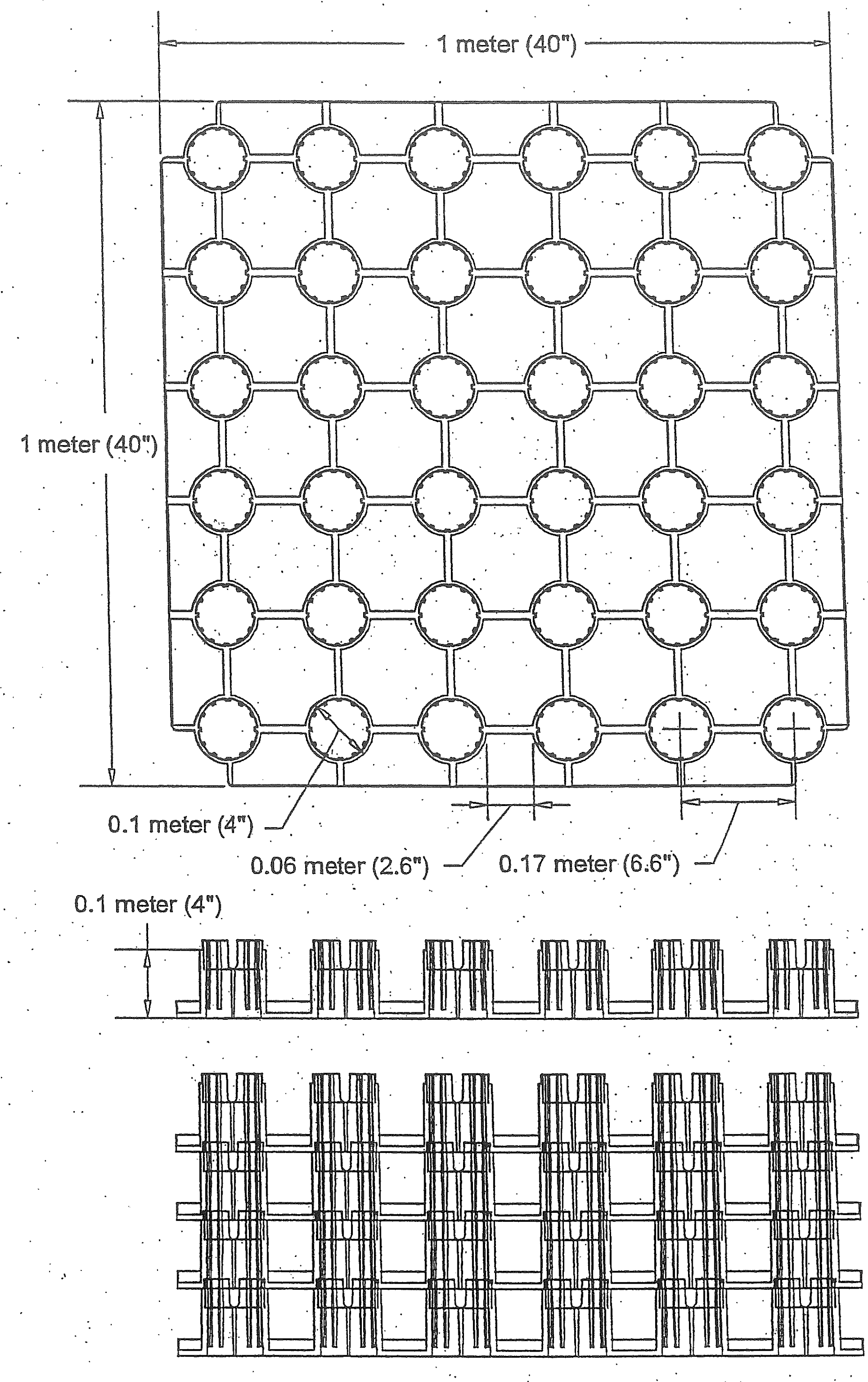
Typical RS3 Installation below paving

NOT TO SCALE

Invisible Structures, Inc.
RS3system.dwg

1600 Jackson Street, Suite 310
Golden, Colorado 80401
800-233-1510 FAX: 800-233-1522
www.invisiblestructures.com 02/04

Rainstore3 Unit Dimensions



Rainstore3 Unit Detail

NOT TO SCALE

Single Rainstore3 injection molded unit geometry and dimensions

Invisible
Structures, Inc.
RS3detail.dwg

1600 Jackson St. Suite 310
Golden, Colorado 80401
800-233-1510 FAX: 800-233-1522
www.invisiblestructures.com 08/04

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CLIENT	CADCAM Associates		
PROJECT	Woodard & Curran Building Addition		
DESIGNED BY	KRV	DATE	2/17/2006
CHECKED BY		DATE	
PROJECT NO.	203834.01	SHEET NO	1 OF 4

TSS REMOVAL EFFICIENCY (%)

The following estimate is based on the following references.

Stormwater Management for Maine: BMPs (Table 5.1, Table 6.1, Section 6.2.3)
Stormwater Management for Maine: BMPs (1996 Addendum)

INCLUDED IN QUALITY CALCULATIONS - *

SUBCATCHMENT	Description	BMP	%	TOTAL %	Imp Acres	%Imp	TSS Removal
15S	Proprosed North Lot	Water Quality Inlet / Filtration Basin	91	91.0	0.34	25.8	23.5
16S	Proprosed North Lot	Filtration Basin	90	90.0	0.1	7.6	6.8
21S	Proposed Access Road			0.0	0.01	0.8	0.0
22S (partial)	Central Plaza and Parking			0.0	0.26	19.7	0.0
23S (partial)	Proposed Building	Detention Basin	10	10.0	0.17	12.9	1.3
24S	Rear Parking (separate from Bldg)	Dry Swale	69	69.0	0.22	16.7	11.5
25S	Access Rd and Adj. Rear Parking	Dry Swale	69	69.0	0.22	16.7	11.5
					1.32	100.2	54.6

NOT INCLUDED IN QUALITY CALCULATIONS - **

SUBCATCHMENT	Description	BMP	%	TOTAL %	Imp Acres	%Imp	TSS Removal
11S	Existing North Lot	Detention Basin	10	10.0	0.27	0.31	3.1
12S	Entrance to North Lot	Vegetative Swale	25	25.0	0.17	0.20	5.0
22S (partial)	Existing South Lot			0.0	0.11	0.13	0.0
23S (partial)	Existing Building	Detention Basin	10	10.0	0.31	0.36	3.6
					0.86	1.00	11.7

* - Per discussions with MeDEP, TSS removal for the site were based on proposed impervious areas.
** - Existing impervious areas shown for comparison.

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CHECKED BY		DATE	
PROJECT NO.	203834.01	SHEET NO. 2	OF 4

STORMWATER QUALITY TREATMENT MEASURE SIZING

The following estimate is based on the following references.

Stormwater Management for Maine: Volume III BMPs Technical Design Manual
Stormwater Management for Maine: BMPs (Table 5.1, Table 6.1, Section 6.2.3)
Stormwater Management for Maine: BMPs (1996 Addendum)

Treatment Measure	Subcatchments Treated	%TSS Removal	Impervious Area (acres)	Runoff (inches)	Pervious Area (acres)	Runoff (inches)	WQV Required	WQV Provided
Filter Basin #1	16S	90	0.1	1	0.12	0.4	537.2	**561.0**
Filter Basin #2	15S	90	0.34	1	0.14	0.4	1437.5	**1615.0**

Each basin will have a spillway constructed to allow flow from larger to storms to pass through. Each spillway will be at a height of 18 inches above the basin floor and 18 inches below the top and the basin embankments. The width of each spillway has been design so that the peak height of water in each basin during the 25-year storm will be at least one foot below the top of the embankment.

The required treatment storage must be at a depth of no more than 18 inches. As shown in the attached HydroCad calculations, Filter Basin #1 (modeled as Pond P16) and Filter Basin #2 (modeled as Pond P15), have cumulative storages, at depths of 18 inches, of 561 cubic feet and 1,614 cubic feet, respectively. Both Basins have been sized to provide sufficient treatment storage to comply with the requirements of the recently adopted Chapter 500 Stormwater rules. Based on discussions with MeDEP, the basins will provide 90% TSS removal.

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DESIGNED BY KRV DATE 2/17/2006
CHECKED BY DATE
PROJECT NO. 203834.01 SHEET NO. 3 OF 4

STORMWATER QUALITY TREATMENT MEASURE SIZING

The following estimate is based on the following references.

Stormwater Management for Maine: Volume III BMPs Technical Design Manual
Stormwater Management for Maine: BMPs (Table 5.1, Table 6.1, Section 6.2.3)
Stormwater Management for Maine: BMPs (1996 Addendum)

Treatment Measure	Subcatchments Treated	%TSS Removal	Total Area (acres)	Runoff (inches)	WQV Required	WQV Provided
Dry Swale	24S, 25S	69	0.61	0.4	885.7	895.0

The swale will have a spillway constructed to allow flow from larger to storms to pass through. The spillway will be at a height of 18 inches above the basin floor and will allow runoff from the 10-year storm to pass with 6 inches of freeboard. Further, the swale will be constructed to remain stable and pass runoff from the 25-year storm.

The required treatment storage must be at a depth of no more than 18 inches. As shown in the attached HydroCad calculations, the dry swale (modeled as Pond P24) has a cumulative storage, at a depth of 18 inches, of 895 cubic feet. The swale passes runoff from the 10-year storm with 6.1 inches of freeboard and the 25-year storm with 5.8 inches of freeboard. The dry swale has been properly sized to provide 69% TSS removal.

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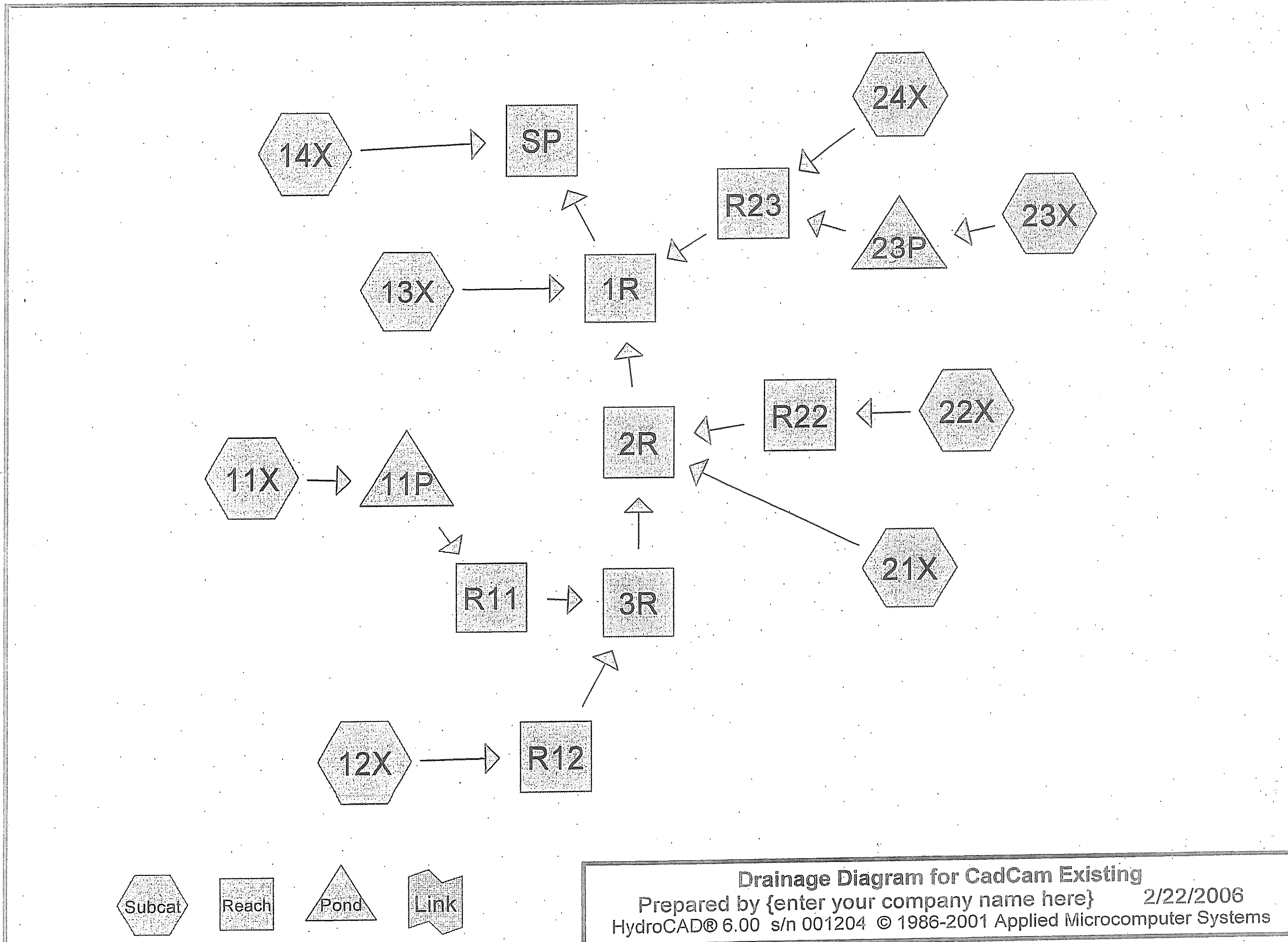
STORMWATER QUALITY TREATMENT MEASURE SIZING

The following estimate is based on the following references.

Stormwater Management for Maine: Volume III BMPs Technical Design Manual
Stormwater Management for Maine: BMPs (Table 5.1, Table 6.1, Section 6.2.3)
Stormwater Management for Maine: BMPs (1996 Addendum)

Treatment Measure	Location	10-year runoff (cfs)	Design Length (Linear Feet)
Level Spreader	Outlet of Filtration Basin #1	0.74	2.96
Level Spreader	West side of Access Lane	2.49	9.96
Level Spreader	East side of Access Lane	0.42	1.68
Level Spreader	Outlet of Dry Swale	2	8

The design criteria for the level spreaders, presented in the Maine Erosion and Sedimentation Control BMPs, were consulted to determine the required level spreader length. Level Spreaders were sized based on 0.25 cfs per linear foot for the 10-year storm. However, the specifications for level spreaders state that the minimum length shall be 12 feet. Therefore, all level spreaders will be 12 feet in length.



Drainage Diagram for CadCam Existing
Prepared by {enter your company name here} 2/22/2006
HydroCAD® 6.00 s/n 001204 © 1986-2001 Applied Microcomputer Systems

Time span=5.00-30.00 hrs, dt=0.10 hrs, 251 points
Runoff by SCS TR-20 method, UH=SCS, Type III 24-hr Rainfall=3.00"
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 11X: Satellite Parking
Tc=2.1 min CN=95 Area=0.320 ac Runoff= 0.89 cfs 0.065 af

Subcatchment 12X: North/West of Satellite
Tc=4.8 min CN=81 Area=0.590 ac Runoff= 0.85 cfs 0.065 af

Subcatchment 13X: Existing NORTH-CENTRAL
Tc=15.4 min CN=75 Area=0.910 ac Runoff= 0.70 cfs 0.073 af

Subcatchment 14X: Existing Northeast
Tc=20.4 min CN=74 Area=1.040 ac Runoff= 0.67 cfs 0.079 af

Subcatchment 21X: Existing Central
Tc=7.3 min CN=79 Area=0.850 ac Runoff= 1.00 cfs 0.084 af

Subcatchment 22X: Existing Parking and Entrance Circle
Tc=12.0 min CN=84 Area=0.720 ac Runoff= 1.02 cfs 0.091 af

Subcatchment 23X: Existing Buildings and surrounding
Tc=8.3 min CN=91 Area=0.810 ac Runoff= 1.65 cfs 0.140 af

Subcatchment 24X: Behind Existing Pond
Tc=11.6 min CN=73 Area=0.230 ac Runoff= 0.17 cfs 0.016 af

Reach 1R: Existing Swale Inflow= 4.49 cfs 0.533 af
Length= 200.0' Max Vel= 0.9 fps Capacity= 43.53 cfs Outflow= 4.25 cfs 0.533 af

Reach 2R: Existing Swale Inflow= 2.50 cfs 0.304 af
Length= 80.0' Max Vel= 1.3 fps Capacity= 144.69 cfs Outflow= 2.38 cfs 0.304 af

Reach 3R: Existing Swale Inflow= 0.95 cfs 0.129 af
Length= 120.0' Max Vel= 0.9 fps Capacity= 63.42 cfs Outflow= 0.87 cfs 0.129 af

Reach R11: From P11 to Swale Inflow= 0.17 cfs 0.064 af
Length= 70.0' Max Vel= 0.2 fps Capacity= 33.01 cfs Outflow= 0.17 cfs 0.064 af

Reach R12: 48" RCP Inflow= 0.85 cfs 0.065 af
Length= 90.0' Max Vel= 7.0 fps Capacity= 463.95 cfs Outflow= 0.82 cfs 0.065 af

Reach R22: From 22 to Swale Inflow= 1.02 cfs 0.091 af
Length= 90.0' Max Vel= 0.4 fps Capacity= 27.37 cfs Outflow= 0.91 cfs 0.091 af

Reach R23: From Pond23 to Swale Inflow= 1.60 cfs 0.156 af
Length= 40.0' Max Vel= 0.5 fps Capacity= 21.38 cfs Outflow= 1.44 cfs 0.156 af

Reach SP: Study Point Inflow= 4.92 cfs 0.612 af
Length= 100.0' Max Vel= 0.4 fps Capacity= 239.77 cfs Outflow= 4.72 cfs 0.612 af

Pond 11P: Existing Satellie Lot Detention Pond Peak Storage= 917 cf Inflow= 0.89 cfs 0.065 af
Primary= 0.17 cfs 0.064 af Secondary= 0.00 cfs 0.000 af Outflow= 0.17 cfs 0.064 af

Pond 23P: Pond 23 Peak Storage= 894 cf Inflow= 1.65 cfs 0.140 af
Primary= 0.86 cfs 0.133 af Secondary= 0.58 cfs 0.006 af Outflow= 1.45 cfs 0.140 af

Runoff Area = 5.470 ac Volume = 0.613 af Average Depth = 1.34"

Subcatchment 11X: Satellite Parking

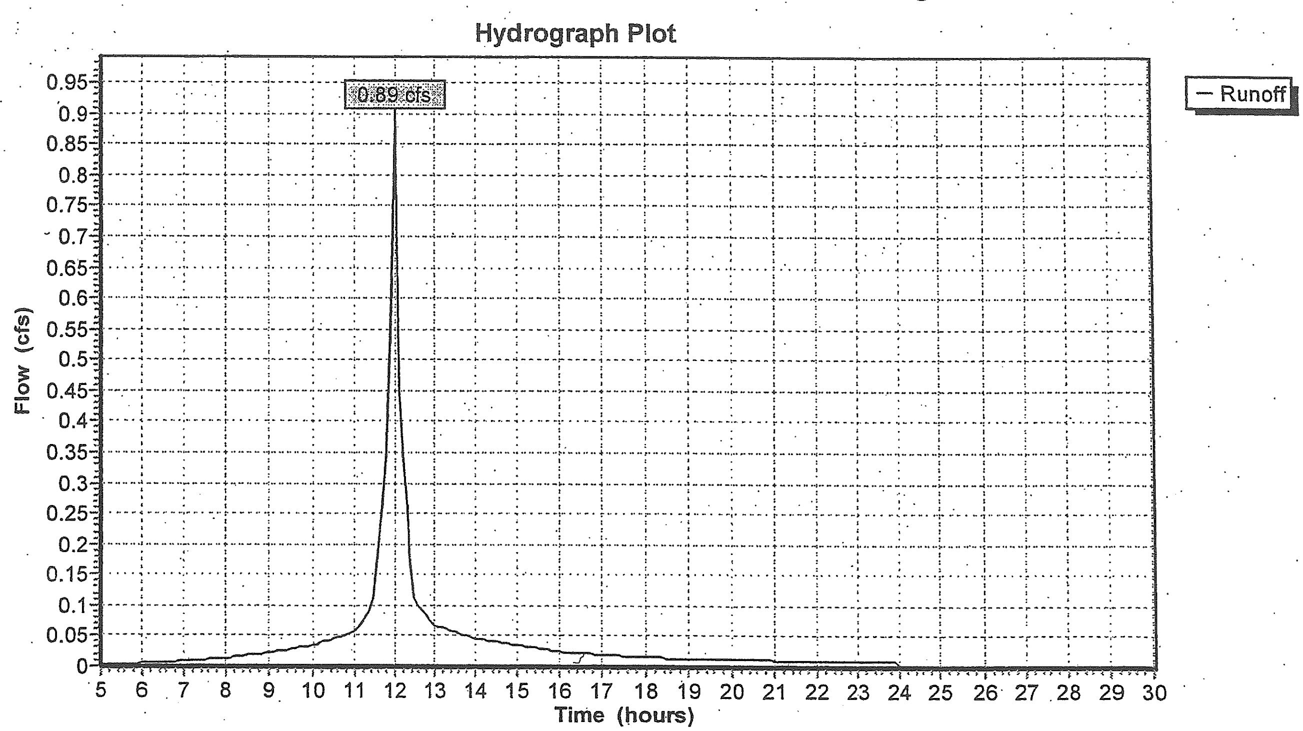
Runoff = 0.89 cfs @ 11.99 hrs, Volume= 0.065 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.270	98	IMPERVIOUS (PARKING LOT)
0.040	74	OPEN SPACE (GOOD)-HSG "C"
0.010	89	RIP RAP-HSG "C"
0.320	95	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0303	1.6		**Sheet Flow, Segment ID:AB** Smooth surfaces n= 0.011 P2= 3.00"
0.1	15	0.3300	4.0		**Shallow Concentrated Flow, Segment ID:BC** Kv= 7.0 fps
0.9	55	0.0200	1.0		**Shallow Concentrated Flow, Segment ID:CD** Short Grass Pasture Kv= 7.0 fps
2.1	170	Total			

Subcatchment 11X: Satellite Parking



Subcatchment 12X: North/West of Satellite

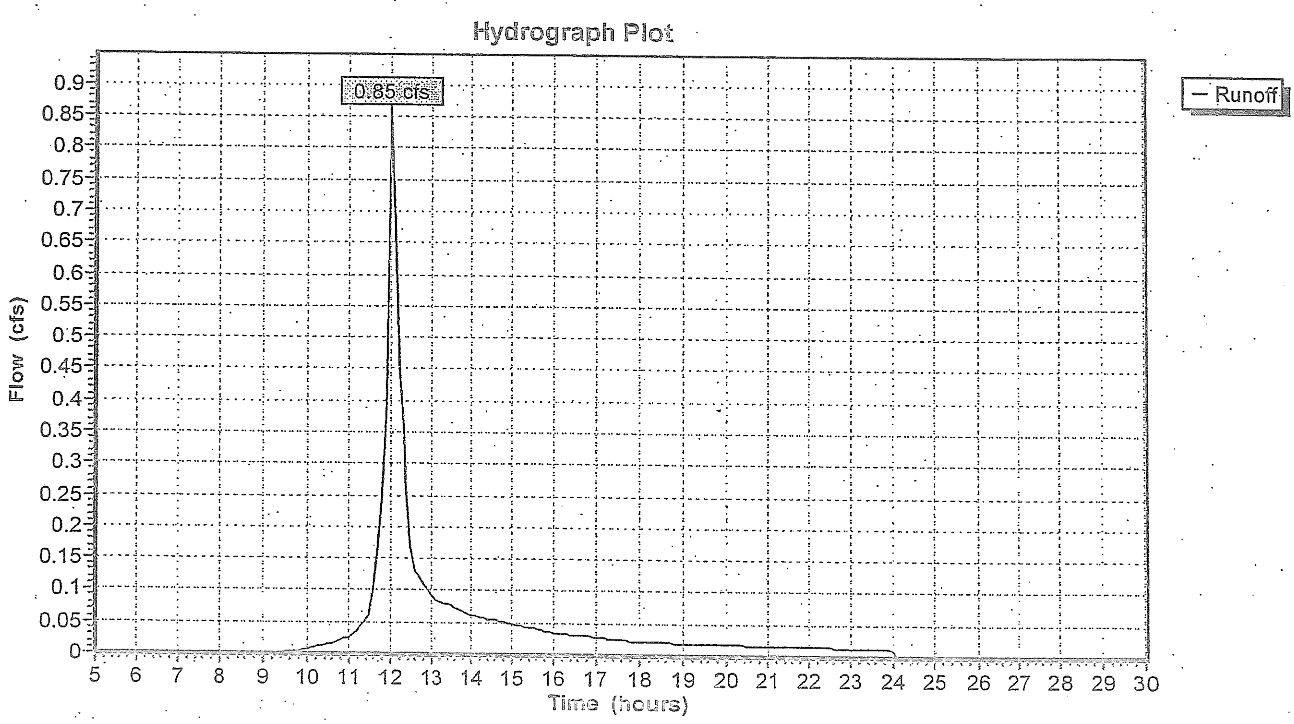
Runoff = 0.85 cfs @ 12.02 hrs, Volume= 0.065 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.020	73	WOODS (FAIR)-HSG "C"
0.400	74	OPEN SPACE (GOOD)-HSG "C"
0.170	98	IMPERVIOUS
0.590	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	16	0.1900	0.2		**Sheet Flow, Segment ID:AB** Grass: Dense n= 0.240 P2= 3.00"
0.8	13	0.5000	0.3		**Sheet Flow, Segment ID:BC** Grass: Dense n= 0.240 P2= 3.00"
1.3	185	0.0270	2.5		**Shallow Concentrated Flow, Segment ID:CD** Grassed Waterway Kv= 15.0 fps
0.2	60	0.0100	5.7	7.00	**Circular Channel (pipe), SEGMENT ID:DE** Diam= 15.0" Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
1.1	165	0.0300	2.6		**Shallow Concentrated Flow, SEGMENT ID:EF** Grassed Waterway Kv= 15.0 fps
4.8	439	Total			

Subcatchment 12X: North/West of Satellite



Subcatchment 13X: Existing NORTH-CENTRAL

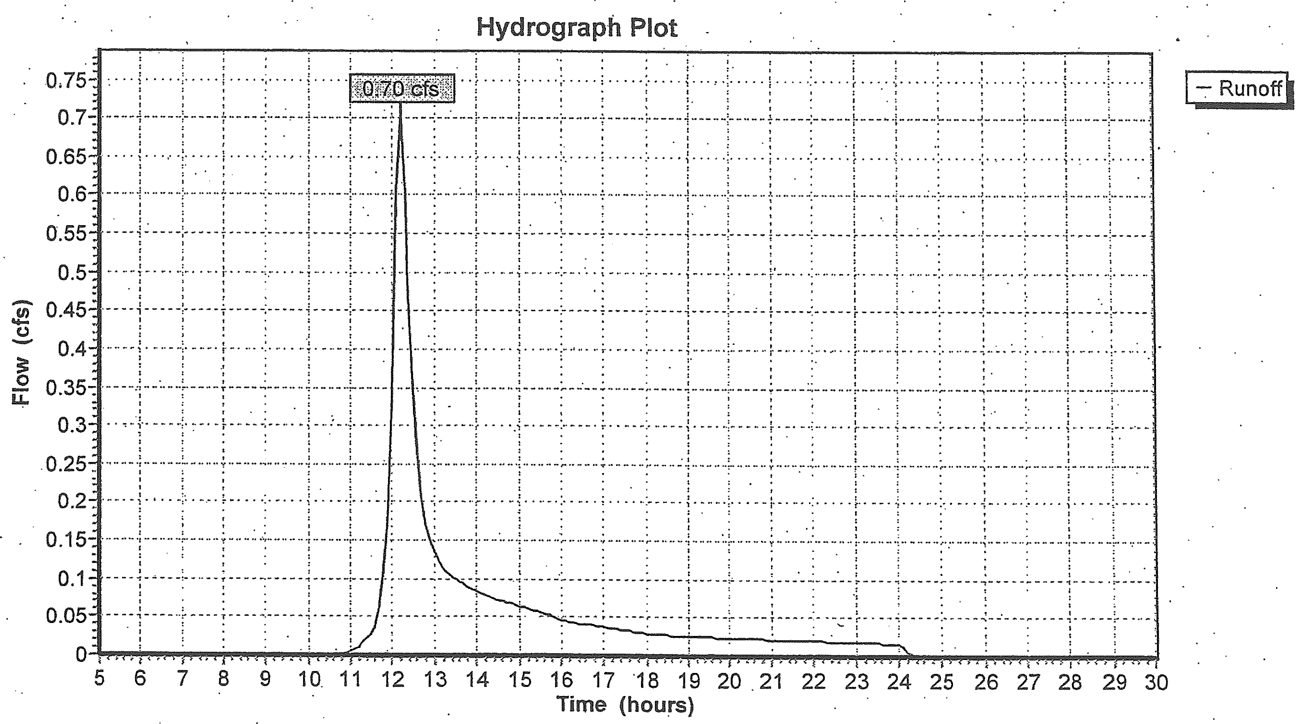
Runoff = 0.70 cfs @ 12.20 hrs, Volume= 0.073 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.000	98	IMPERVIOUS (PAVEMENT)
0.540	73	WOODS (FAIR)-HSG "C"
0.130	74	OPEN SPACE (GOOD)-HSG "C"
0.240	79	WOODS (FAIR)-HSG "D"
0.910	75	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	35	0.0700	0.1		**Sheet Flow, Segment ID:AB** Woods: Light underbrush n= 0.400 P2= 3.00"
6.7	65	0.1700	0.2		**Sheet Flow, Segment ID:BC** Woods: Light underbrush n= 0.400 P2= 3.00"
1.2	130	0.1300	1.8		**Shallow Concentrated Flow, SegmentC-D** Woodland Kv= 5.0 fps
1.7	100	0.0400	1.0		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
15.4	330	Total			

Subcatchment 13X: Existing NORTH-CENTRAL



Subcatchment 21X: Existing Central

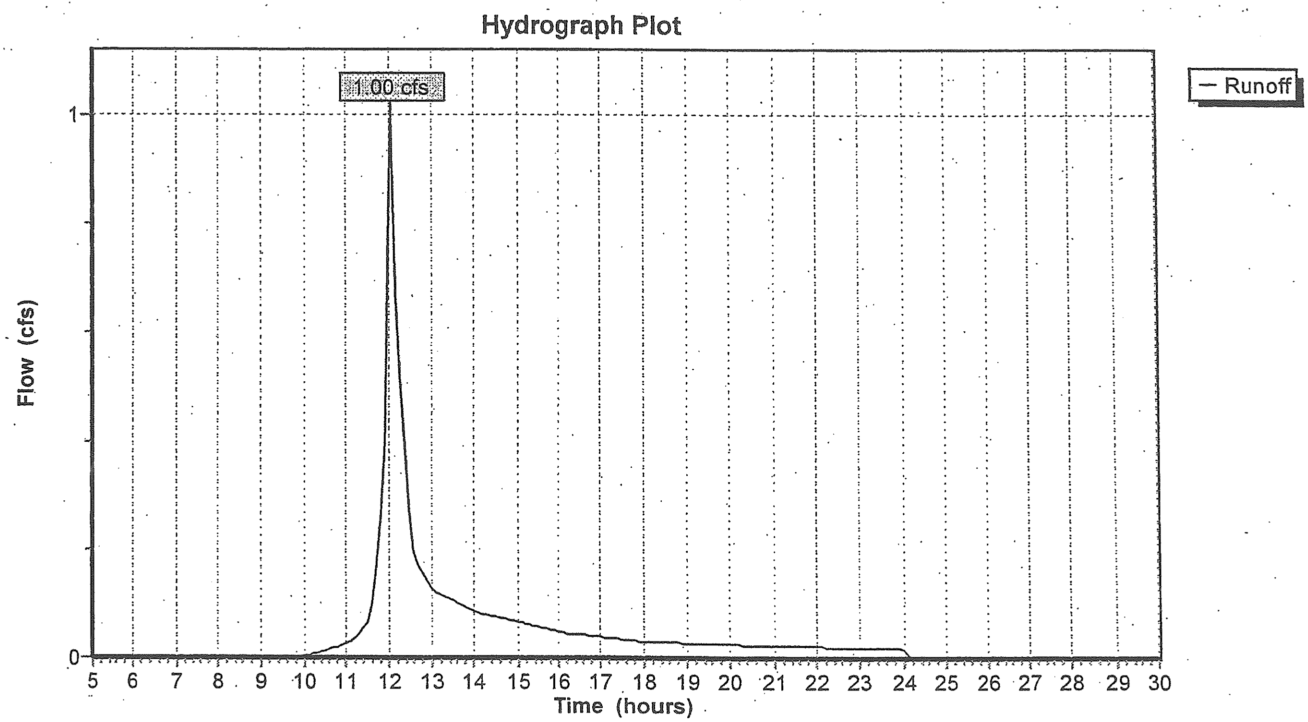
Runoff = 1.00 cfs @ 12.08 hrs, Volume= 0.084 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.260	73	WOODS (FAIR)-HSG "C"
0.250	74	OPEN SPACE (GOODG "C"
0.200	79	WOODS (FAIR)-HSD "D"
0.140	98	IMPERVIOUS (BLDG, PAVEMENT)
0.850	79	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	75	0.0600	0.2		**Sheet Flow, Segment ID:AB** Grass: Short n= 0.150 P2= 3.00"
0.7	15	0.4000	0.4		**Sheet Flow, SegmentBC** Grass: Short n= 0.150 P2= 3.00"
0.2	30	0.2700	2.6		**Shallow Concentrated Flow, Segment ID:CD** Woodland Kv= 5.0 fps
1.2	80	0.0500	1.1		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
7.3	200	Total			

Subcatchment 21X: Existing Central



Subcatchment 22X: Existing Parking and Entrance Circle

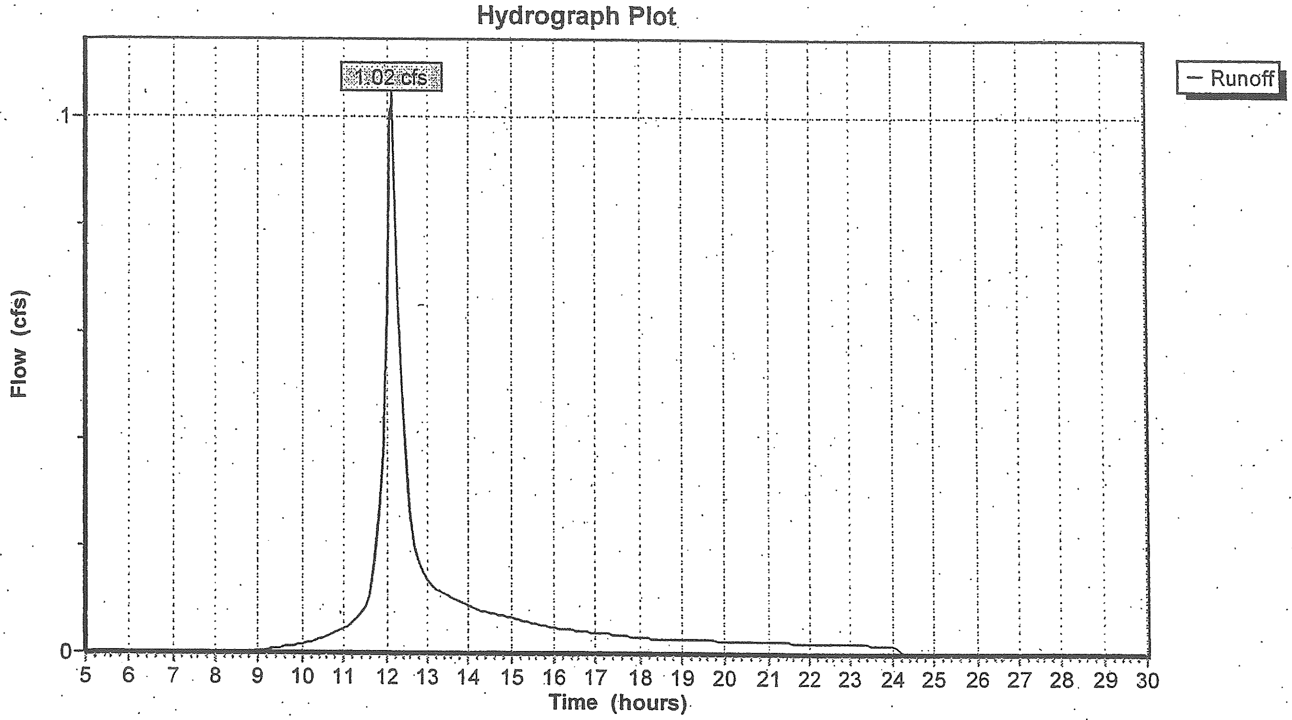
Runoff = 1.02 cfs @ 12.13 hrs, Volume= 0.091 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.130	73	WOODS (FAIR)-HSG "C"
0.280	74	OPEN SPACE (GOODG "C"
0.310	98	IMPERVIOUS (BLDG, PAVEMENT)
0.720	84	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0167	0.1		**Sheet Flow, Segment ID:AB** Grass: Short n= 0.150 P2= 3.00"
0.4	20	0.0125	0.8		**Sheet Flow, SegmentBC** Smooth surfaces n= 0.011 P2= 3.00"
7.9	65	0.1100	0.1		**Sheet Flow, SegmentCD** Woods: Light underbrush n= 0.400 P2= 3.00"
0.8	70	0.0860	1.5		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
0.4	90	0.0333	3.7		**Shallow Concentrated Flow, Segment ID:EF** Paved Kv= 20.3 fps
0.1	65	0.0500	12.0	9.42	**Circular Channel (pipe), SegmentFG** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011
12.0	325	Total			

Subcatchment 22X: Existing Parking and Entrance Circle



Subcatchment 23X: Existing Buildings and surrounding

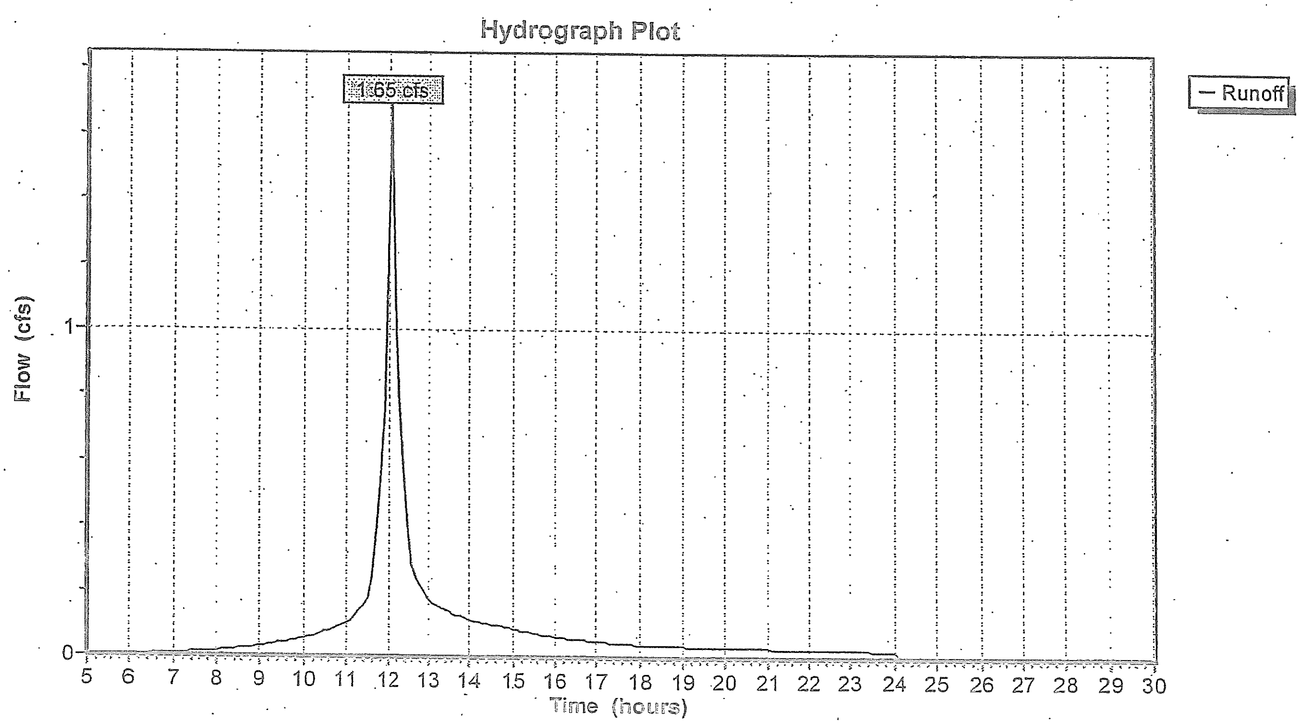
Runoff = 1.65 cfs @ 12.08 hrs, Volume= 0.140 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.310	79	OPEN SPACE (FAIR)-HSG "C"
0.200	98	Paved parking & roofs
0.300	98	Paved parking & roofs
0.810	91	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	10	0.2000	0.3		**Sheet Flow, Segment ID:AB** Grass: Short n= 0.150 P2= 3.00"
6.4	90	0.0500	0.2		**Sheet Flow, Segment ID:BC** Grass: Short n= 0.150 P2= 3.00"
0.4	60	0.1100	2.3		**Shallow Concentrated Flow, Segment ID:CD** Short Grass Pasture Kv= 7.0 fps
0.0	10	0.3000	3.8		**Shallow Concentrated Flow, Segment ID:DE** Short Grass Pasture Kv= 7.0 fps
0.9	95	0.0630	1.8		**Shallow Concentrated Flow, SegmentEF** Short Grass Pasture Kv= 7.0 fps
8.3	265	Total			

Subcatchment 23X: Existing Buildings and surrounding



Subcatchment 24X: Behind Existing Pond

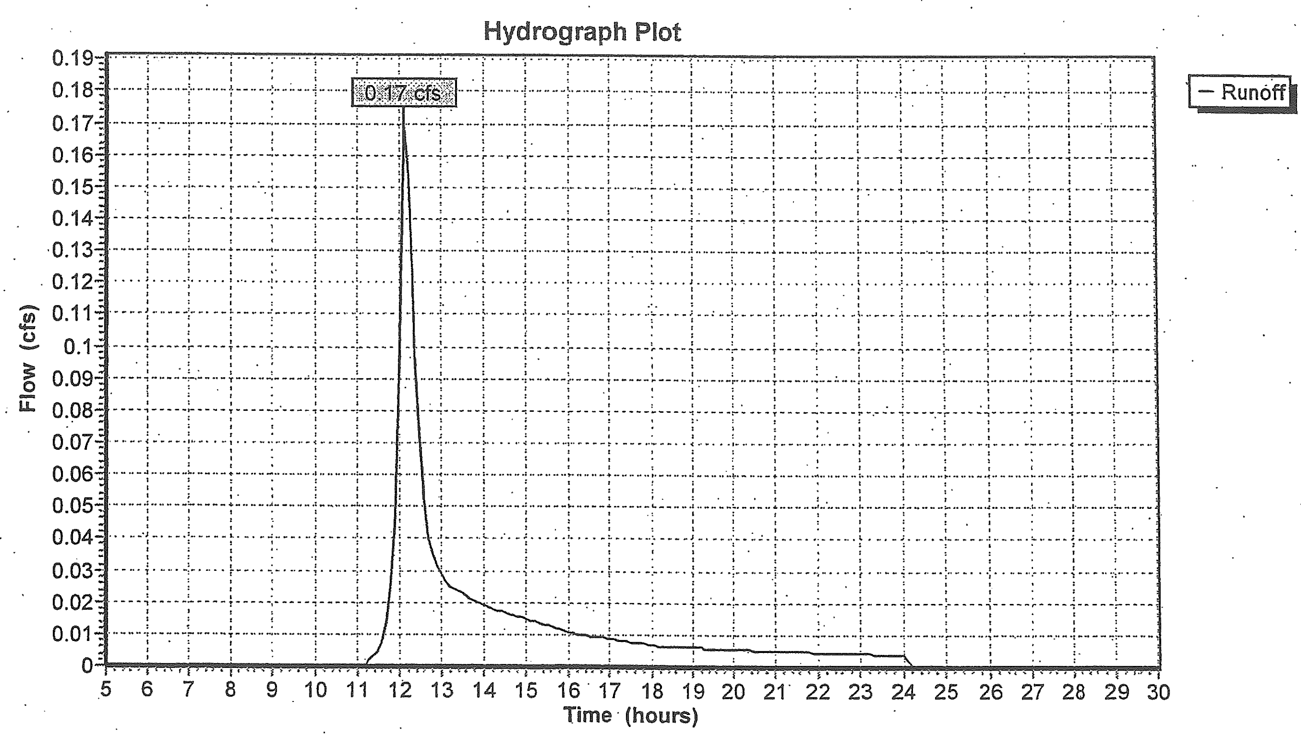
Runoff = 0.17 cfs @ 12.14 hrs, Volume= 0.016 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.230	73	Woods, Fair, HSG C

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	45	0.1111	0.1		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.00"
4.2	55	0.0545	0.2		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
1.5	125	0.0800	1.4		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
11.6	225	Total			

Subcatchment 24X: Behind Existing Pond

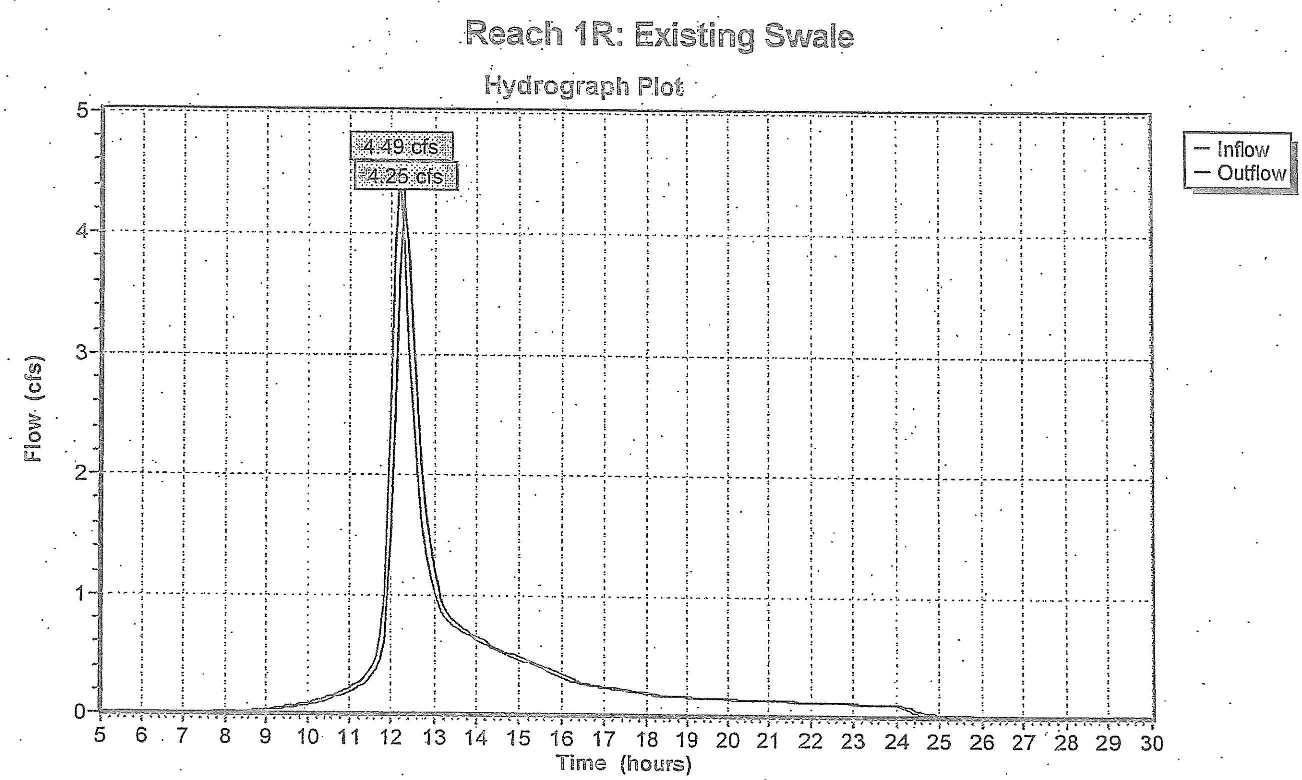


Reach 1R: Existing Swale

Inflow	=	4.49 cfs @ 12.20 hrs,	Volume=	0.533 af
Outflow	=	4.25 cfs @ 12.31 hrs,	Volume=	0.533 af, Atten= 5%, Lag= 6.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.9 fps, Min. Travel Time= 3.7 min
Avg. Velocity = 0.3 fps, Avg. Travel Time= 13.1 min

Peak Depth= 0.57'
Capacity at bank full= 43.53 cfs
Inlet Invert= 30.00', Outlet Invert= 29.50'
7.00' x 2.00' deep channel, n= 0.050 Length= 200.0' Slope= 0.0025 '/'
Side Slope Z-value= 3.0 2.0 '/'



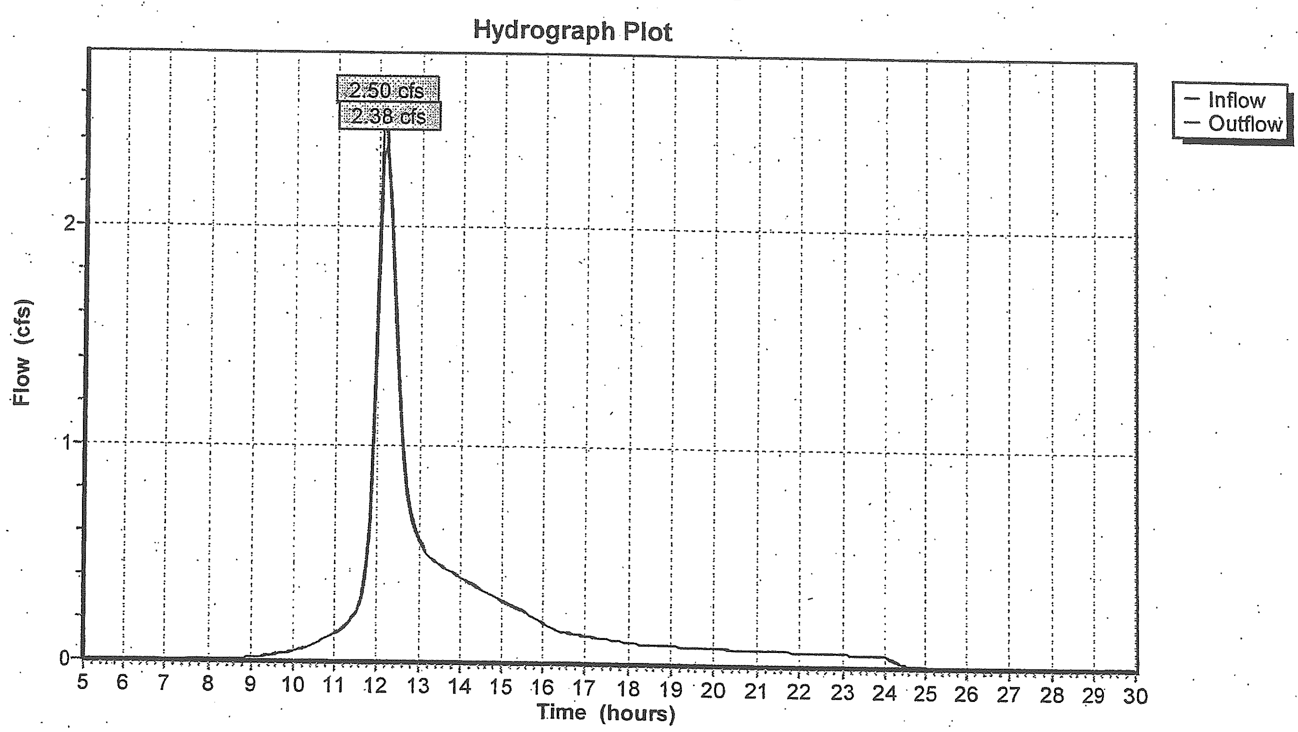
Reach 2R: Existing Swale

Inflow	=	2.50 cfs @	12.13 hrs, Volume=	0.304 af	
Outflow	=	2.38 cfs @	12.16 hrs, Volume=	0.304 af,	Atten= 5%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.3 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 0.4 fps, Avg. Travel Time= 3.1 min

Peak Depth= 0.34'
Capacity at bank full= 144.69 cfs
Inlet Invert= 30.80', Outlet Invert= 30.00'
5.00' x 3.00' deep channel, n= 0.050 Length= 80.0' Slope= 0.0100 '/'
Side Slope Z-value= 2.0 '/'

Reach 2R: Existing Swale



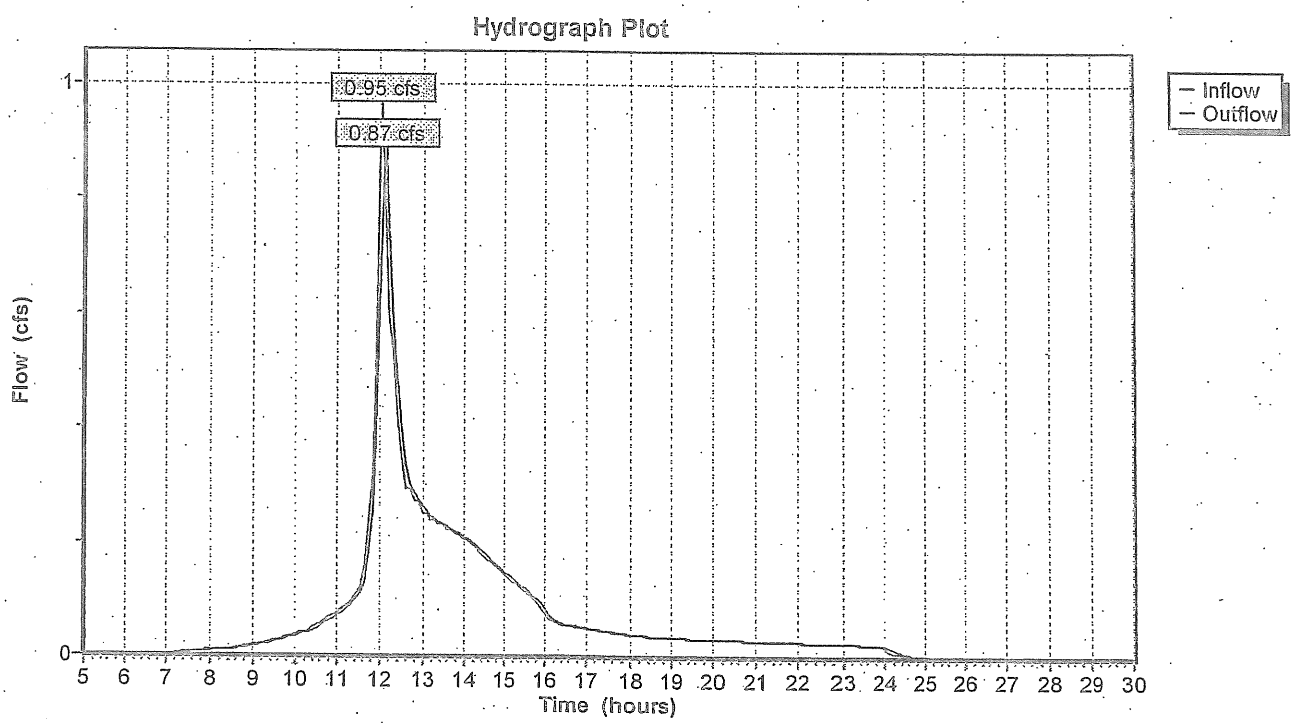
Reach 3R: Existing Swale

Inflow	=	0.95 cfs @	12.04 hrs, Volume=	0.129 af
Outflow	=	0.87 cfs @	12.12 hrs, Volume=	0.129 af, Atten= 8%, Lag= 4.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.9 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 0.3 fps, Avg. Travel Time= 6.4 min

Peak Depth= 0.19'
Capacity at bank full= 63.42 cfs
Inlet Invert= 32.00', Outlet Invert= 30.80'
5.00' x 2.00' deep channel, n= 0.050 Length= 120.0' Slope= 0.0100 '/'
Side Slope Z-value= 2.0 '/'

Reach 3R: Existing Swale



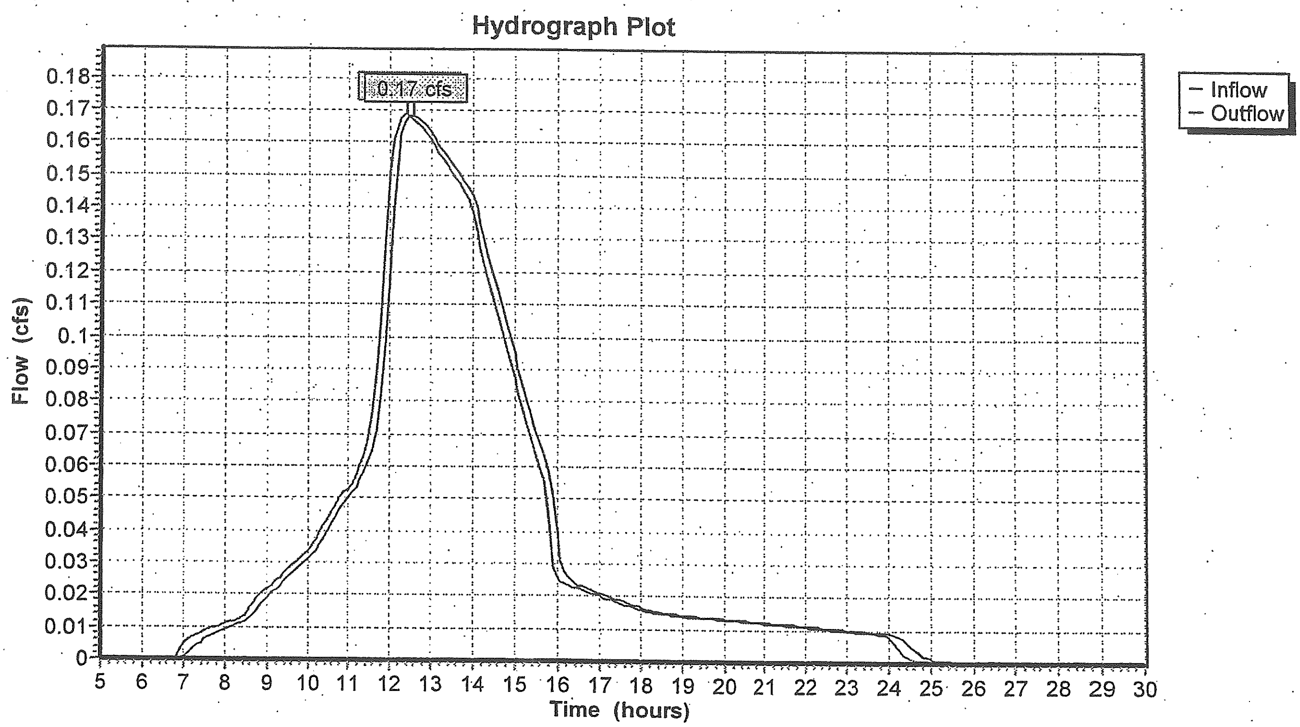
Reach R11: From P11 to Swale

Inflow	=	0.17 cfs @ 12.42 hrs, Volume=	0.064 af
Outflow	=	0.17 cfs @ 12.57 hrs, Volume=	0.064 af, Atten= 0%, Lag= 9.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.2 fps, Min. Travel Time= 5.3 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 10.8 min

Peak Depth= 0.05'
Capacity at bank full= 33.01 cfs
Inlet Invert= 45.90', Outlet Invert= 32.00'
15.00' x 1.00' deep channel, n= 0.400 Length= 70.0' Slope= 0.1986 '/'
Side Slope Z-value= 10.0 '/'

Reach R11: From P11 to Swale



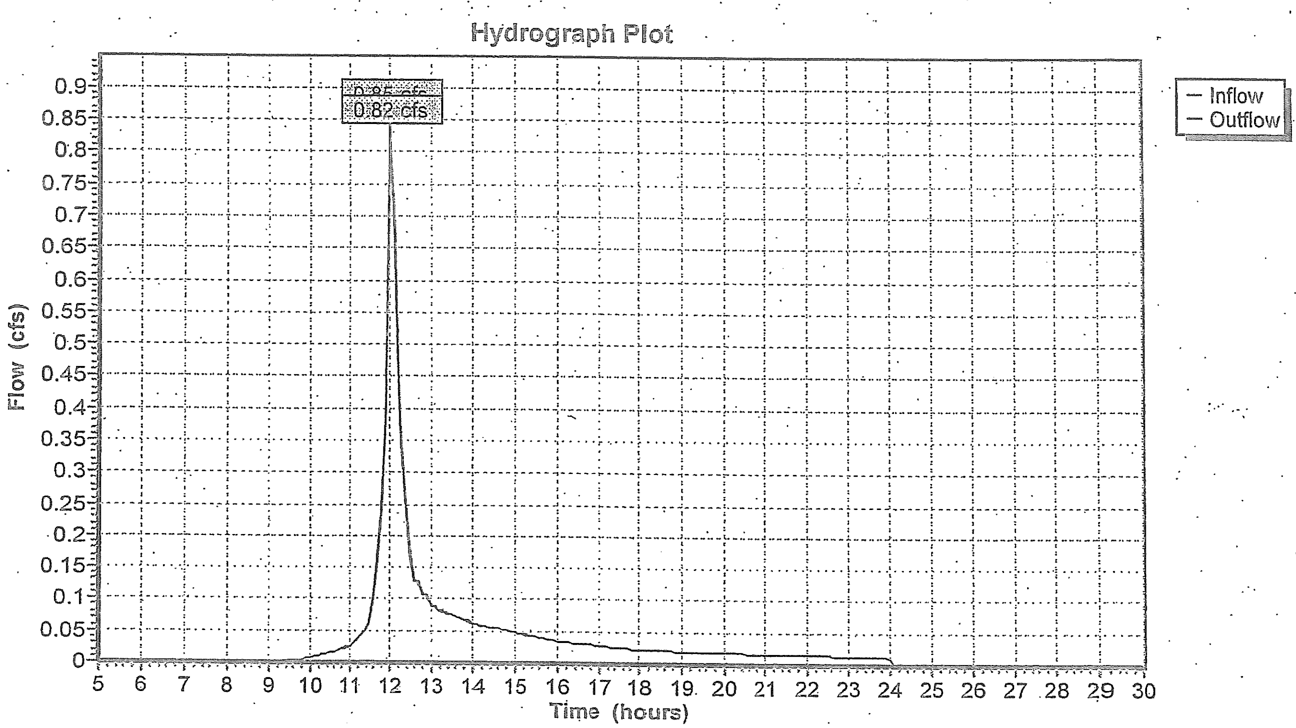
Reach R12: 48" RCP

Inflow	=	0.85 cfs @ 12.02 hrs, Volume=	0.065 af	
Outflow	=	0.82 cfs @ 12.03 hrs, Volume=	0.065 af,	Atten= 3%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 7.0 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.5 fps, Avg. Travel Time= 0.4 min

Peak Depth= 0.13'
Capacity at bank full= 463.95 cfs
Inlet Invert= 40.00', Outlet Invert= 32.00'
48.0" Diameter Pipe n= 0.012 Length= 90.0' Slope= 0.0889 '/'

Reach R12: 48" RCP



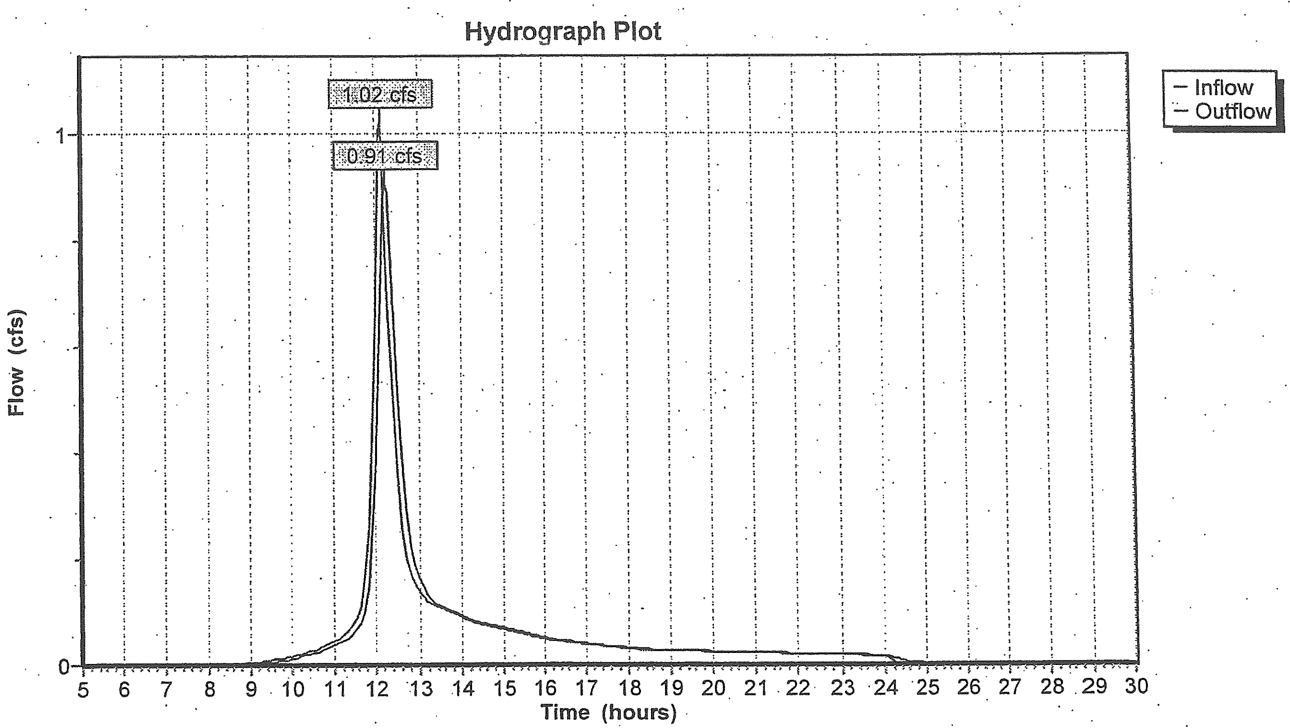
Reach R22: From 22 to Swale

Inflow	=	1.02 cfs @ 12.13 hrs,	Volume=	0.091 af
Outflow	=	0.91 cfs @ 12.25 hrs,	Volume=	0.091 af, Atten= 11%, Lag= 7.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.4 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 13.2 min

Peak Depth= 0.15'
Capacity at bank full= 27.37 cfs
Inlet Invert= 44.00', Outlet Invert= 30.50'
15.00' x 1.00' deep channel, n= 0.400 Length= 90.0' Slope= 0.1500 '/'
Side Slope Z-value= 15.0 2.0 '/'

Reach R22: From 22 to Swale



Reach R23: From Pond23 to Swale

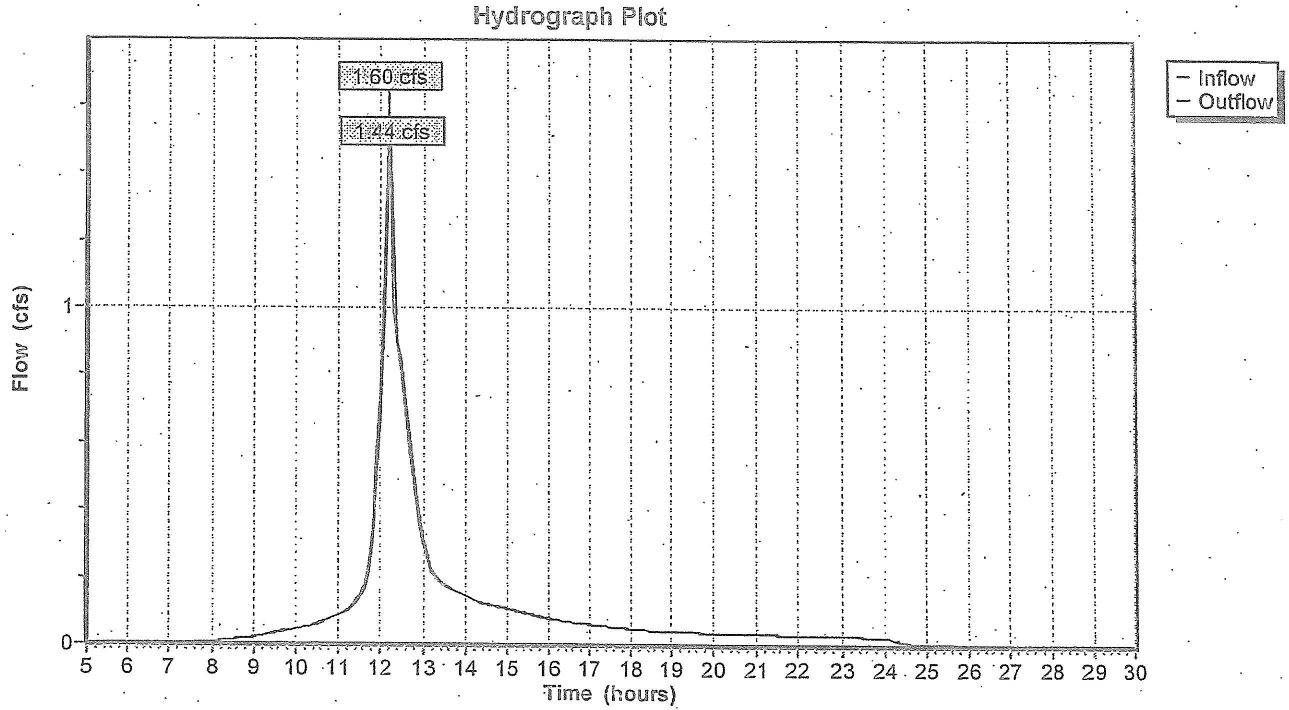
Inflow = 1.60 cfs @ 12.19 hrs, Volume= 0.156 af
Outflow = 1.44 cfs @ 12.22 hrs, Volume= 0.156 af, Atten= 10%, Lag= 1.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.5 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.2 fps, Avg. Travel Time= 4.0 min

Peak Depth= 0.30'
Capacity at bank full= 21.38 cfs
Inlet Invert= 37.00', Outlet Invert= 30.00'
5.00' x 1.00' deep channel, n= 0.400 Length= 40.0' Slope= 0.1750 '/'
Side Slope Z-value= 15.0 '/'

Reach R23: From Pond23 to Swale

Hydrograph Plot



Reach SP: Study Point

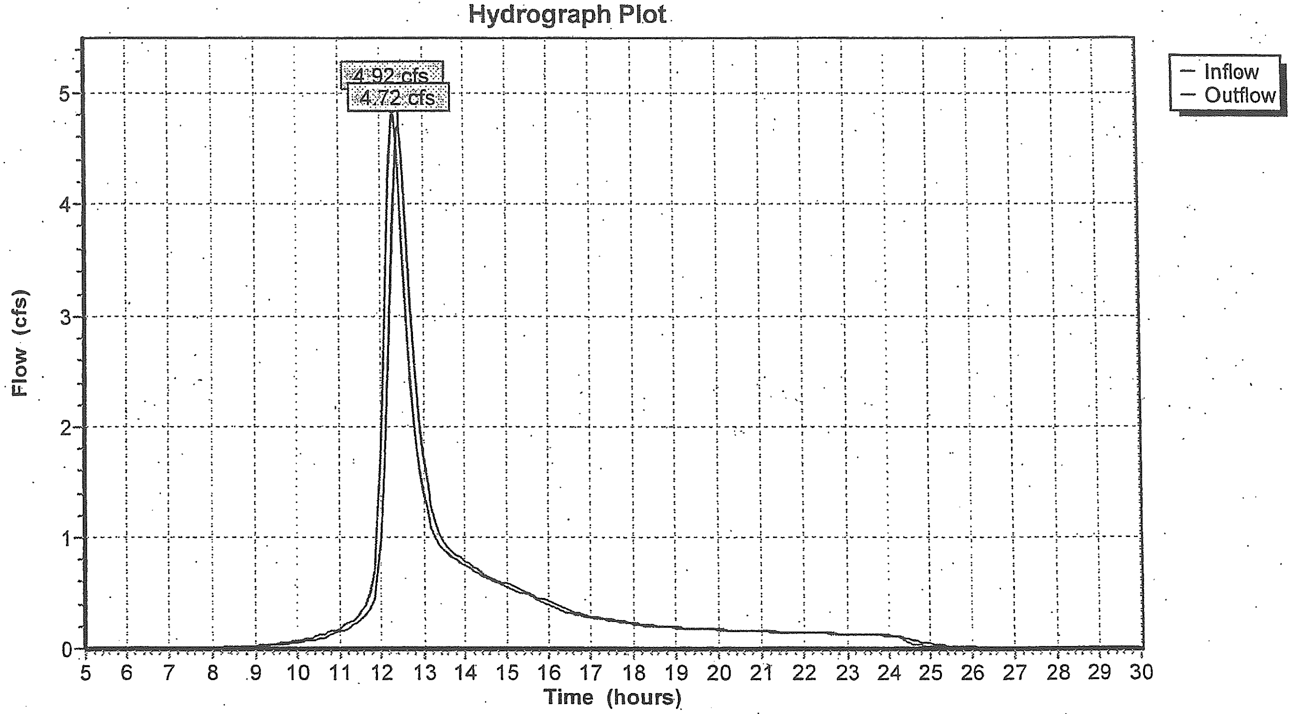
Inflow = 4.92 cfs @ 12.31 hrs, Volume= 0.612 af
Outflow = 4.72 cfs @ 12.43 hrs, Volume= 0.612 af, Atten= 4%, Lag= 7.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.4 fps, Min. Travel Time= 4.0 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 12.9 min

Peak Depth= 0.31'
Capacity at bank full= 239.77 cfs
Inlet Invert= 29.50', Outlet Invert= 29.40'
35.00' x 3.00' deep channel, n= 0.050 Length= 100.0' Slope= 0.0010 '/'
Side Slope Z-value= 5.0 4.0 '/'

Reach SP: Study Point

Hydrograph Plot



Pond 11P: Existing Satellie Lot Detention Pond

Inflow =	0.89 cfs @ 11.99 hrs,	Volume=	0.065 af
Outflow =	0.17 cfs @ 12.42 hrs,	Volume=	0.064 af, Atten= 81%, Lag= 25.5 min
Primary =	0.17 cfs @ 12.42 hrs,	Volume=	0.064 af
Secondary =	0.00 cfs @ 5.00 hrs,	Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 48.47' Storage= 917 cf
Plug-Flow detention time= 55.7 min calculated for 0.064 af (98% of inflow)
Storage and wetted areas determined by Prismatic sections

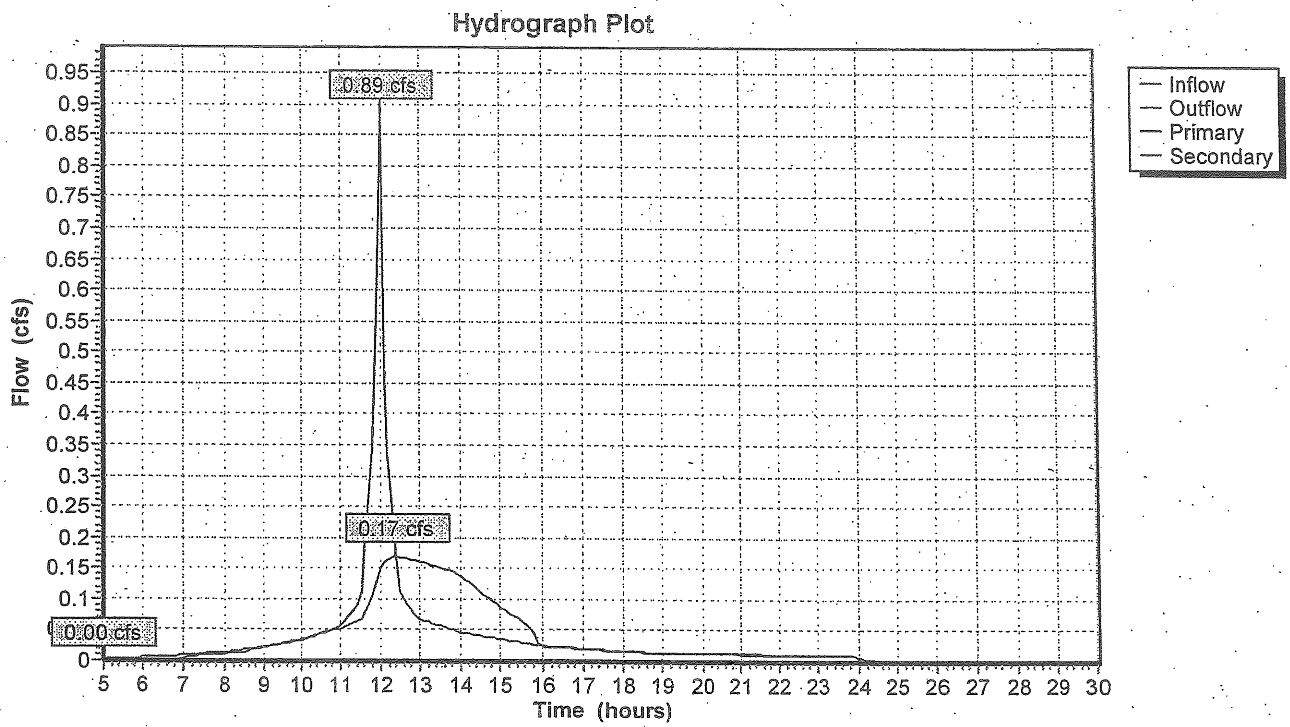
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.00	10	0	0
47.00	117	64	64
48.00	674	396	459
49.00	1,276	975	1,434

Primary OutFlow (Free Discharge)
├─1=Orifice/Grate
└─2=Orifice/Grate

Secondary OutFlow (Free Discharge)
└─3=Sharp-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	46.50'	**1.0" Vert. Orifice/Grate** C= 0.600
2	Primary	46.80'	**2.0" Vert. Orifice/Grate** C= 0.600
3	Secondary	48.50'	**3.1' long x 0.5' high Sharp-Crested Rectangular Weir** 0 End Contraction(s)

Pond 11P: Existing Satellie Lot Detention Pond



Pond 23P: Pond 23

Inflow =	1.65 cfs @	12.08 hrs,	Volume=	0.140 af	
Outflow =	1.45 cfs @	12.20 hrs,	Volume=	0.140 af,	Atten= 13%, Lag= 6.8 min
Primary =	0.86 cfs @	12.19 hrs,	Volume=	0.133 af	
Secondary =	0.58 cfs @	12.20 hrs,	Volume=	0.006 af	

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 41.08' Storage= 894 cf
Plug-Flow detention time= 22.7 min calculated for 0.139 af (99% of inflow)
Storage and wetted areas determined by Prismatic sections

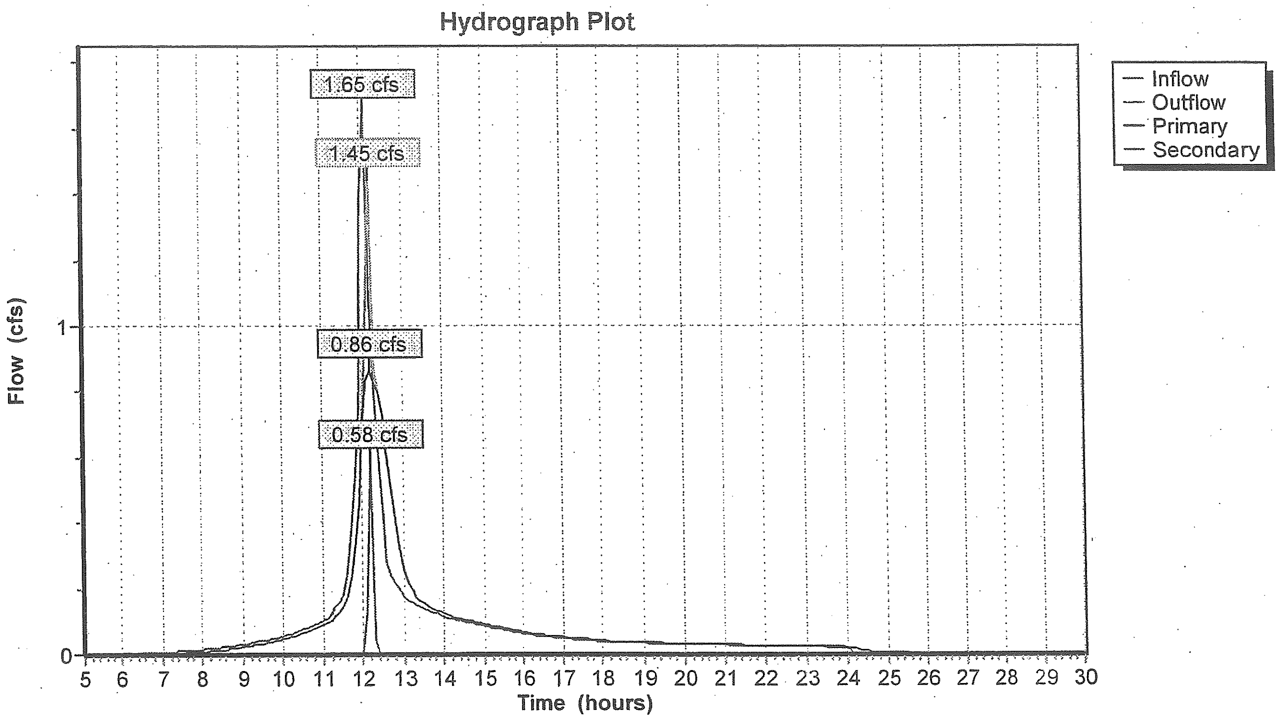
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
40.00	608	0	0
41.00	996	802	802
41.50	1,265	565	1,367

Primary OutFlow (Free Discharge)
└─1=Culvert

Secondary OutFlow (Free Discharge)
└─2=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	40.00'	**6.0" x 17.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 37.00' S= 0.1765 '/' n= 0.011 Cc= 0.900
2	Secondary	41.00'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.3

Pond 23P: Pond 23



Time span=5.00-30.00 hrs, dt=0.10 hrs, 251 points
Runoff by SCS TR-20 method, UH=SCS, Type III 24-hr Rainfall=4.70"
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 11X: Satellite Parking
Tc=2.1 min CN=95 Area=0.320 ac Runoff= 1.44 cfs 0.109 af

Subcatchment 12X: North/West of Satellite
Tc=4.8 min CN=81 Area=0.590 ac Runoff= 1.78 cfs 0.134 af

Subcatchment 13X: Existing NORTH-CENTRAL
Tc=15.4 min CN=75 Area=0.910 ac Runoff= 1.69 cfs 0.167 af

Subcatchment 14X: Existing Northeast
Tc=20.4 min CN=74 Area=1.040 ac Runoff= 1.70 cfs 0.184 af

Subcatchment 21X: Existing Central
Tc=7.3 min CN=79 Area=0.850 ac Runoff= 2.17 cfs 0.180 af

Subcatchment 22X: Existing Parking and Entrance Circle
Tc=12.0 min CN=84 Area=0.720 ac Runoff= 2.01 cfs 0.180 af

Subcatchment 23X: Existing Buildings and surrounding
Tc=8.3 min CN=91 Area=0.810 ac Runoff= 2.87 cfs 0.249 af

Subcatchment 24X: Behind Existing Pond
Tc=11.6 min CN=73 Area=0.230 ac Runoff= 0.44 cfs 0.039 af

Reach 1R: Existing Swale Inflow= 10.28 cfs 1.058 af
Length= 200.0' Max Vel= 1.2 fps Capacity= 43.53 cfs Outflow= 9.61 cfs 1.058 af

Reach 2R: Existing Swale Inflow= 5.59 cfs 0.602 af
Length= 80.0' Max Vel= 1.7 fps Capacity= 144.69 cfs Outflow= 5.48 cfs 0.602 af

Reach 3R: Existing Swale Inflow= 2.03 cfs 0.242 af
Length= 120.0' Max Vel= 1.2 fps Capacity= 63.42 cfs Outflow= 2.02 cfs 0.242 af

Reach R11: From P11 to Swale Inflow= 1.13 cfs 0.108 af
Length= 70.0' Max Vel= 0.4 fps Capacity= 33.01 cfs Outflow= 0.86 cfs 0.108 af

Reach R12: 48" RCP Inflow= 1.78 cfs 0.134 af
Length= 90.0' Max Vel= 8.8 fps Capacity= 463.95 cfs Outflow= 1.74 cfs 0.134 af

Reach R22: From 22 to Swale Inflow= 2.01 cfs 0.180 af
Length= 90.0' Max Vel= 0.5 fps Capacity= 27.37 cfs Outflow= 1.82 cfs 0.180 af

Reach R23: From Pond23 to Swale Inflow= 3.43 cfs 0.288 af
Length= 40.0' Max Vel= 0.7 fps Capacity= 21.38 cfs Outflow= 3.14 cfs 0.288 af

Reach SP: Study Point Inflow= 11.31 cfs 1.242 af
Length= 100.0' Max Vel= 0.6 fps Capacity= 239.77 cfs Outflow= 10.81 cfs 1.242 af

Pond 11P: Existing Satellie Lot Detention Pond Peak Storage= 1,141 cf Inflow= 1.44 cfs 0.109 af
Primary= 0.18 cfs 0.090 af Secondary= 0.95 cfs 0.019 af Outflow= 1.13 cfs 0.108 af

Pond 23P: Pond 23 Peak Storage= 1,015 cf Inflow= 2.87 cfs 0.249 af
Primary= 0.92 cfs 0.207 af Secondary= 2.08 cfs 0.042 af Outflow= 3.00 cfs 0.249 af

Runoff Area = 5.470 ac Volume = 1.243 af Average Depth = 2.73"

Subcatchment 11X: Satellite Parking

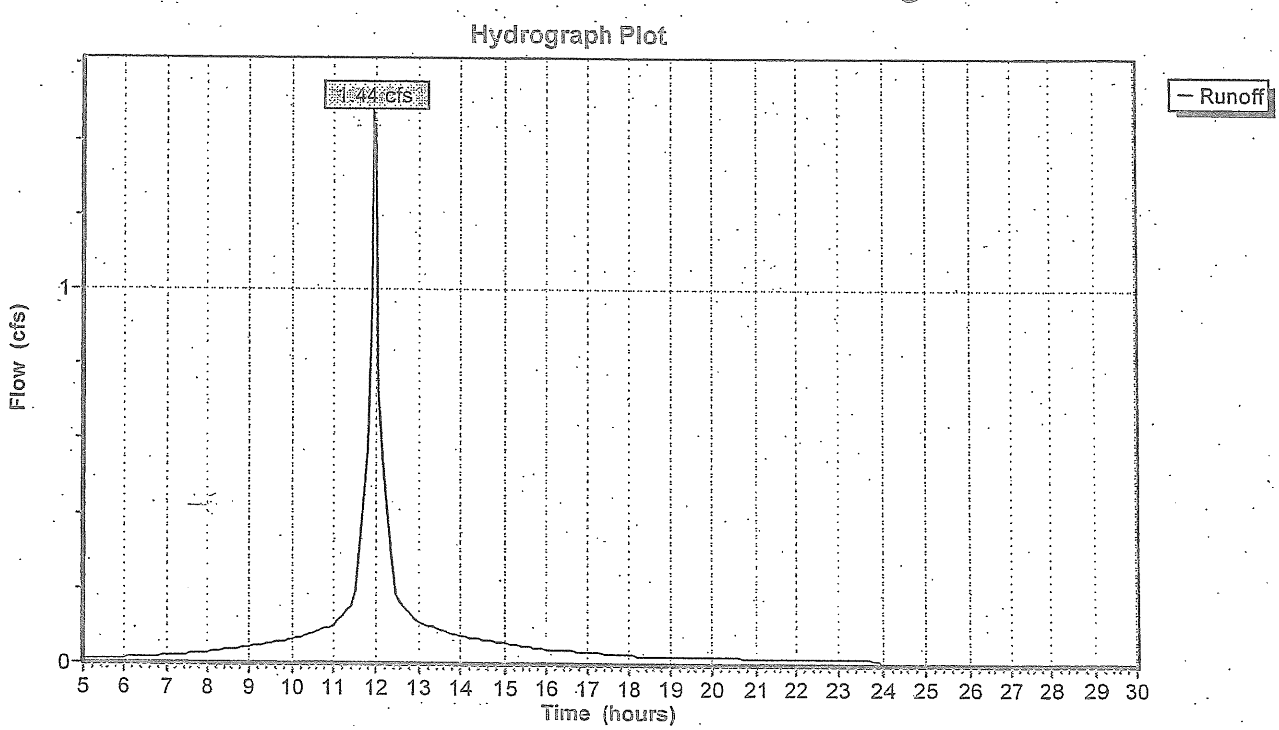
Runoff = 1.44 cfs @ 11.99 hrs, Volume= 0.109 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.270	98	IMPERVIOUS (PARKING LOT)
0.040	74	OPEN SPACE (GOOD)-HSG "C"
0.010	89	RIP RAP-HSG "C"
0.320	95	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0303	1.6		**Sheet Flow, Segment ID:AB** Smooth surfaces n= 0.011 P2= 3.00"
0.1	15	0.3300	4.0		**Shallow Concentrated Flow, Segment ID:BC** Kv= 7.0 fps
0.9	55	0.0200	1.0		**Shallow Concentrated Flow, Segment ID:CD** Short Grass Pasture Kv= 7.0 fps
2.1	170	Total			

Subcatchment 11X: Satellite Parking



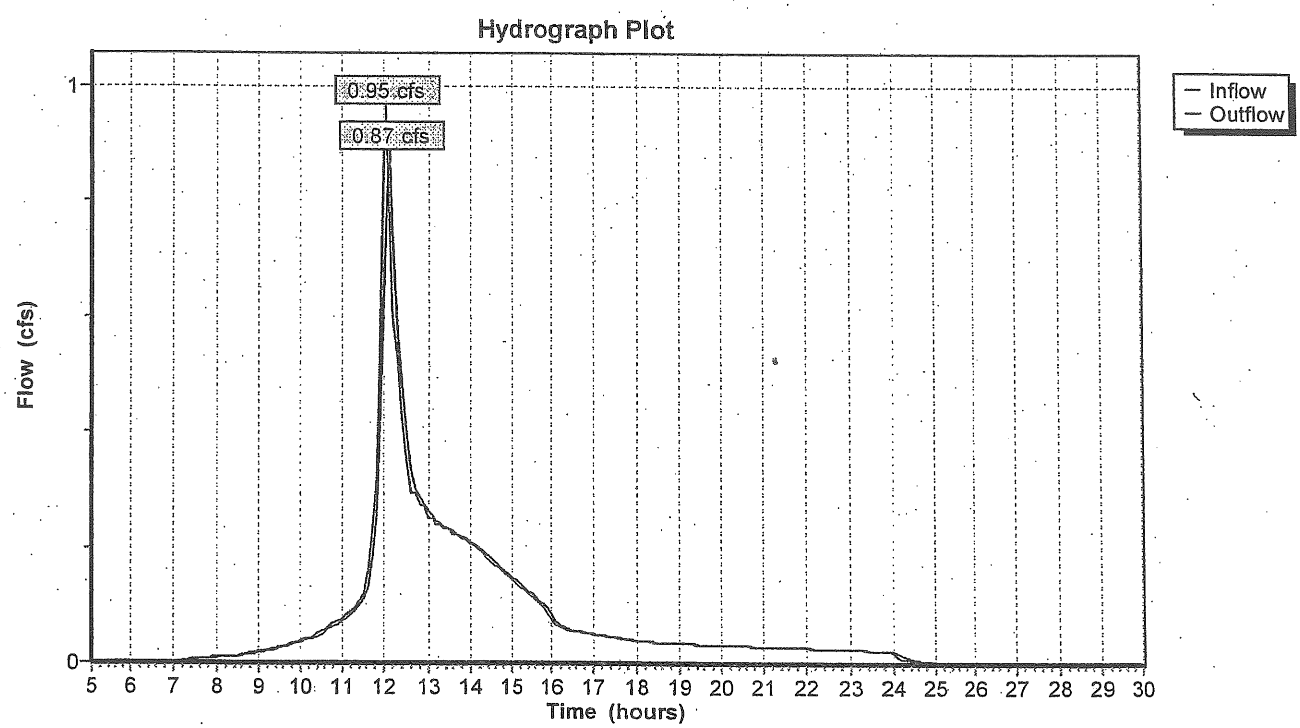
Reach 3R: Existing Swale

Inflow	=	0.95 cfs @	12.04 hrs,	Volume=	0.129 af
Outflow	=	0.87 cfs @	12.12 hrs,	Volume=	0.129 af, Atten= 8%, Lag= 4.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.9 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 0.3 fps, Avg. Travel Time= 6.4 min

Peak Depth= 0.19'
Capacity at bank full= 63.42 cfs
Inlet Invert= 32.00', Outlet Invert= 30.80'
5.00' x 2.00' deep channel, n= 0.050 Length= 120.0' Slope= 0.0100 '/'
Side Slope Z-value= 2.0 '/'

Reach 3R: Existing Swale



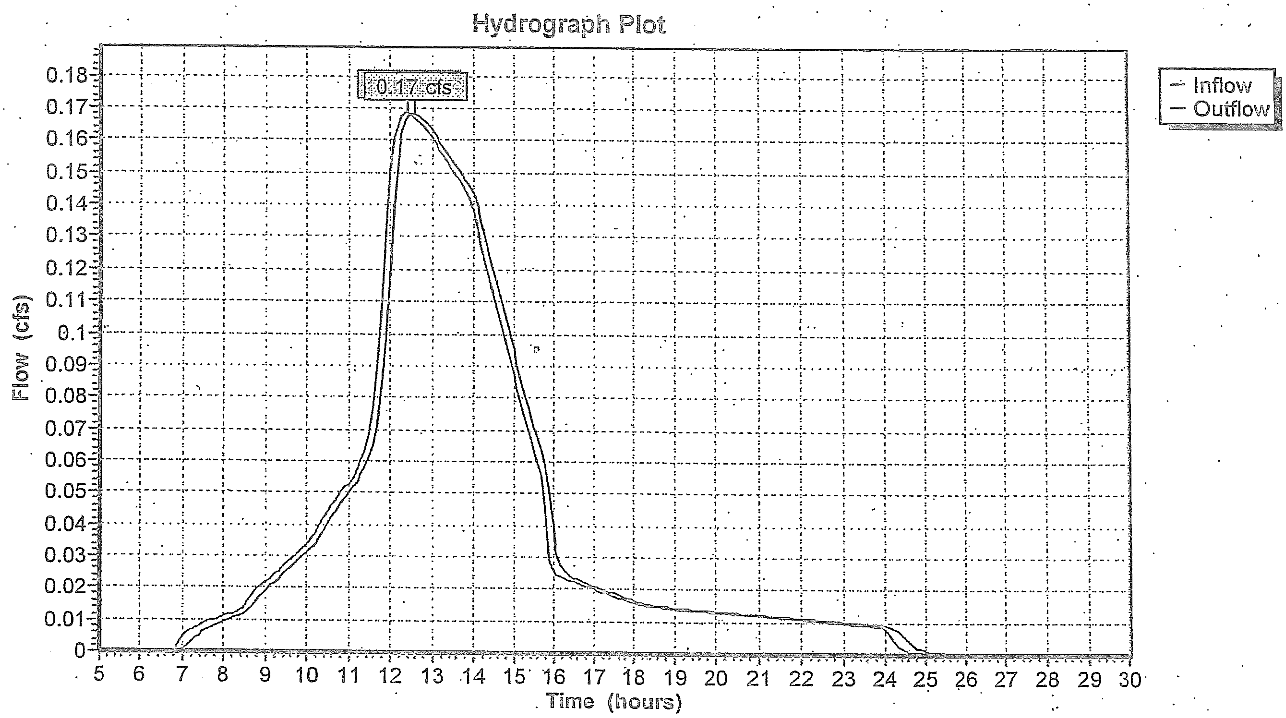
Reach R11: From P11 to Swale

Inflow = 0.17 cfs @ 12.42 hrs, Volume= 0.064 af
Outflow = 0.17 cfs @ 12.57 hrs, Volume= 0.064 af, Atten= 0%, Lag= 9.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.2 fps, Min. Travel Time= 5.3 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 10.8 min

Peak Depth= 0.05'
Capacity at bank full= 33.01 cfs
Inlet Invert= 45.90', Outlet Invert= 32.00'
15.00' x 1.00' deep channel, n= 0.400 Length= 70.0' Slope= 0.1986 '/'
Side Slope Z-value= 10.0 '/'

Reach R11: From P11 to Swale



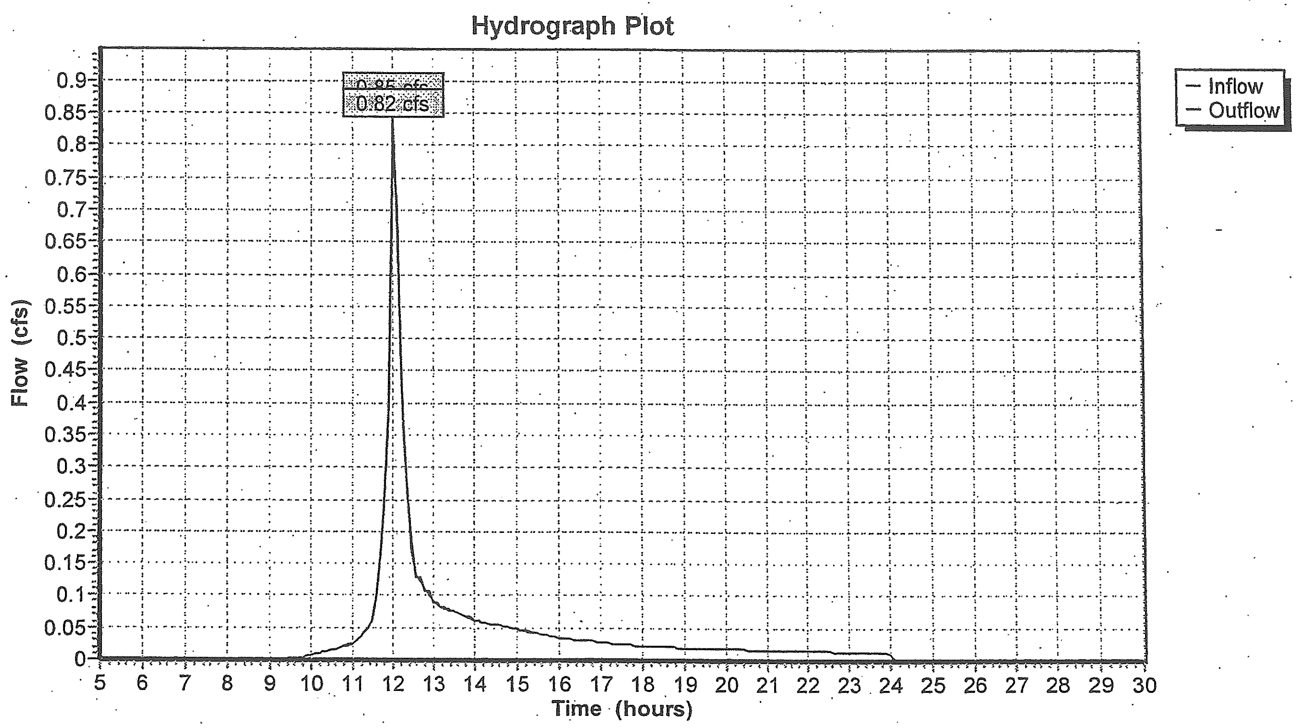
Reach R12: 48" RCP

Inflow = 0.85 cfs @ 12.02 hrs, Volume= 0.065 af
Outflow = 0.82 cfs @ 12.03 hrs, Volume= 0.065 af, Atten= 3%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 7.0 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.5 fps, Avg. Travel Time= 0.4 min

Peak Depth= 0.13'
Capacity at bank full= 463.95 cfs
Inlet Invert= 40.00', Outlet Invert= 32.00'
48.0" Diameter Pipe n= 0.012 Length= 90.0' Slope= 0.0889 '/'

Reach R12: 48" RCP



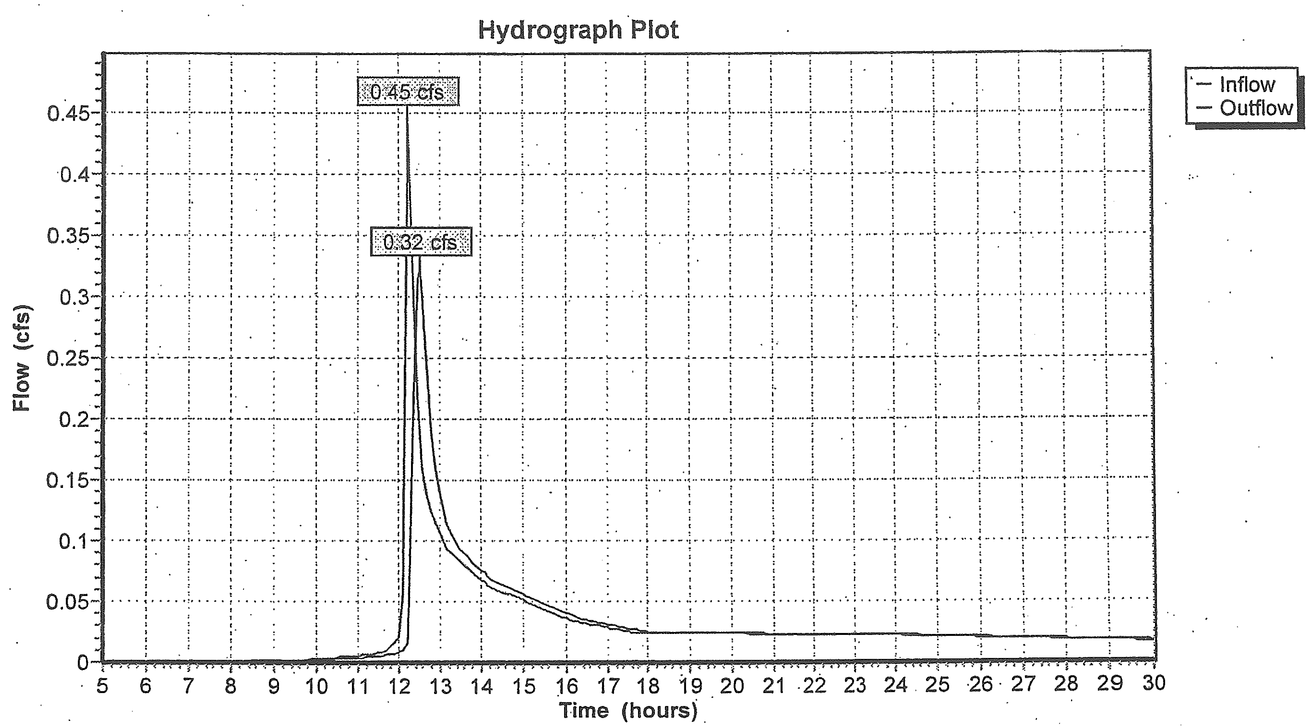
Reach R15: From P15 to Swale

Inflow	=	0.45 cfs @	12.25 hrs,	Volume=	0.059 af	
Outflow	=	0.32 cfs @	12.54 hrs,	Volume=	0.058 af,	Atten= 28%, Lag= 17.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.2 fps, Min. Travel Time= 8.5 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 21.8 min

Peak Depth= 0.15'
Capacity at bank full= 45.62 cfs
Inlet Invert= 34.00', Outlet Invert= 30.00'
10.00' x 2.00' deep channel, n= 0.400 Length= 100.0' Slope= 0.0400 '/'
Side Slope Z-value= 2.0 15.0 '/'

Reach R15: From P15 to Swale



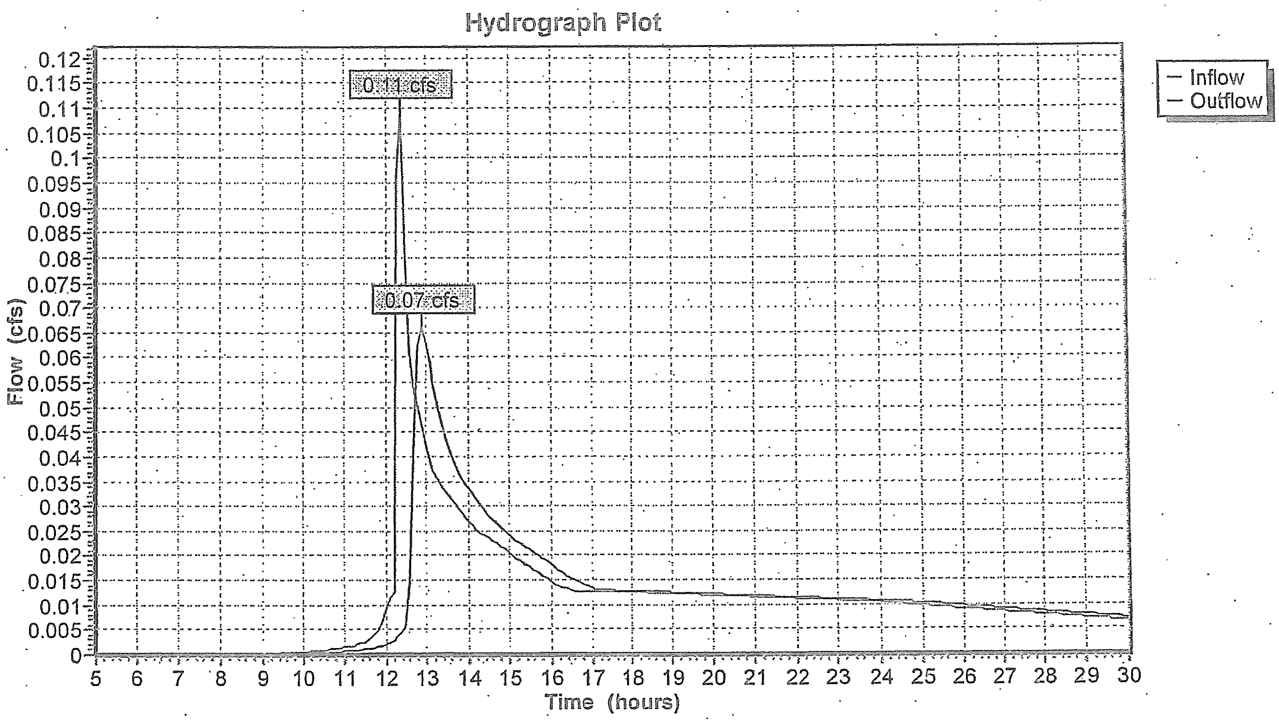
Reach R16: From P16 to Swale

Inflow	=	0.11 cfs @	12.38 hrs, Volume=	0.023 af	
Outflow	=	0.07 cfs @	12.91 hrs, Volume=	0.023 af,	Atten= 39%, Lag= 31.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.1 fps, Min. Travel Time= 18.2 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 33.5 min

Peak Depth= 0.03'
Capacity at bank full= 28.43 cfs
Inlet Invert= 41.00', Outlet Invert= 29.50'
20.00' x 1.00' deep channel, n= 0.400 Length= 120.0' Slope= 0.0958 '/'
Side Slope Z-value= 10.0 '/'

Reach R16: From P16 to Swale



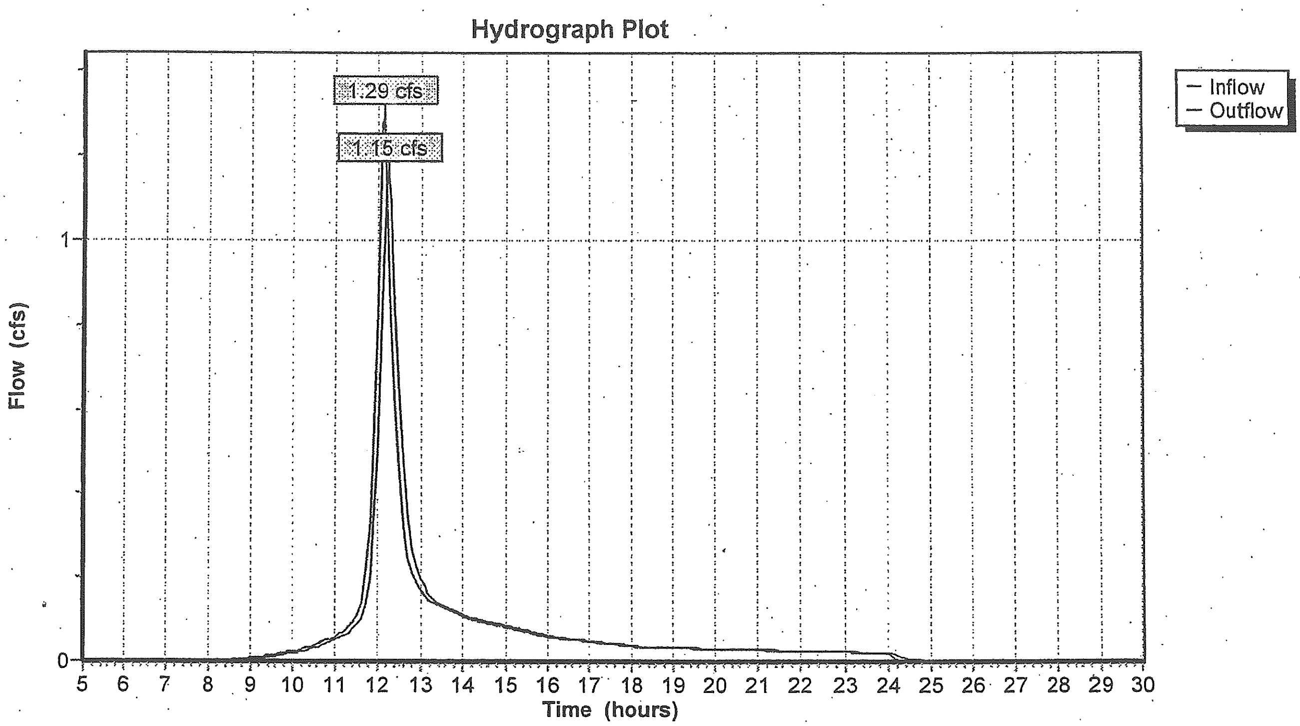
Reach R22: From 22 to Swale

Inflow	=	1.29 cfs @	12.12 hrs, Volume=	0.114 af	
Outflow	=	1.15 cfs @	12.24 hrs, Volume=	0.114 af,	Atten= 10%, Lag= 7.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.4 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 12.4 min

Peak Depth= 0.17'
Capacity at bank full= 27.37 cfs
Inlet Invert= 44.00', Outlet Invert= 30.50'
15.00' x 1.00' deep channel, n= 0.400 Length= 90.0' Slope= 0.1500 '/'
Side Slope Z-value= 15.0 2.0 '/'

Reach R22: From 22 to Swale



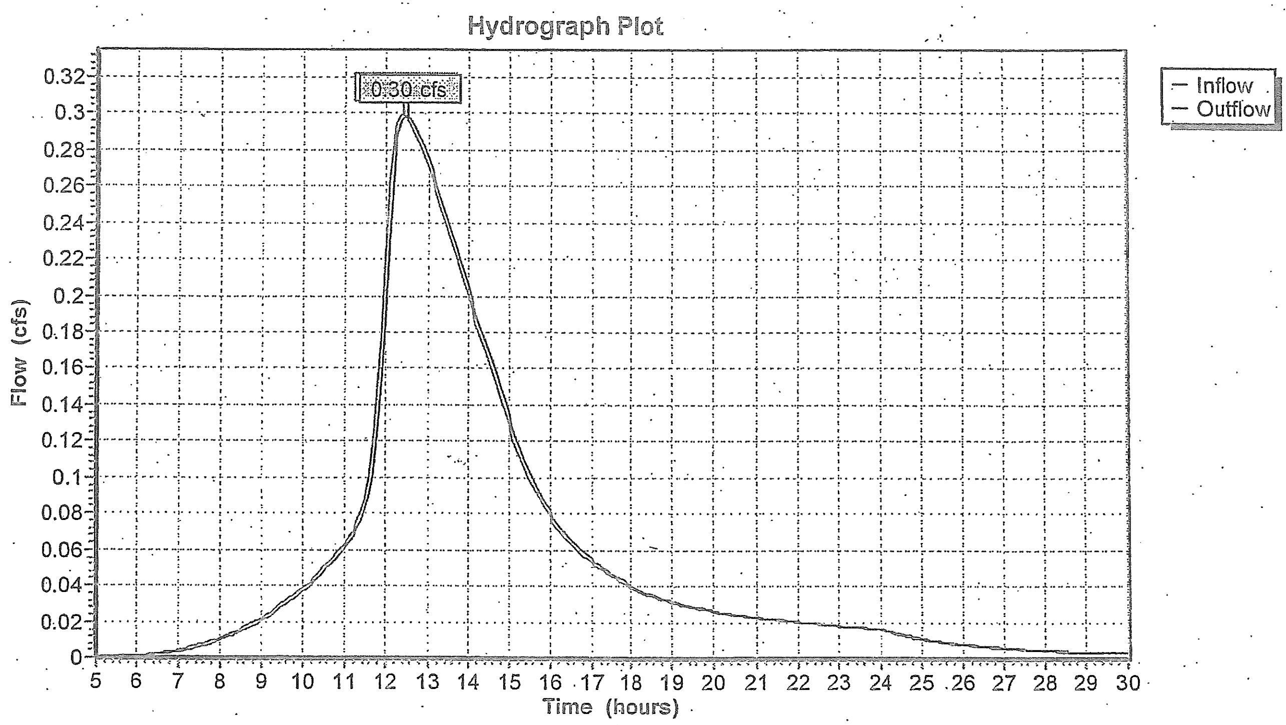
Reach R23: From 25 to Swale

Inflow = 0.30 cfs @ 12.43 hrs, Volume= 0.107 af
Outflow = 0.30 cfs @ 12.52 hrs, Volume= 0.107 af, Atten= 0%, Lag= 5.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.3 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 6.4 min

Peak Depth= 0.09'
Capacity at bank full= 28.77 cfs
Inlet Invert= 39.00', Outlet Invert= 30.00'
10.00' x 1.00' deep channel, n= 0.400 Length= 50.0' Slope= 0.1800 '/'
Side Slope Z-value= 15.0 '/'

Reach R23: From 25 to Swale



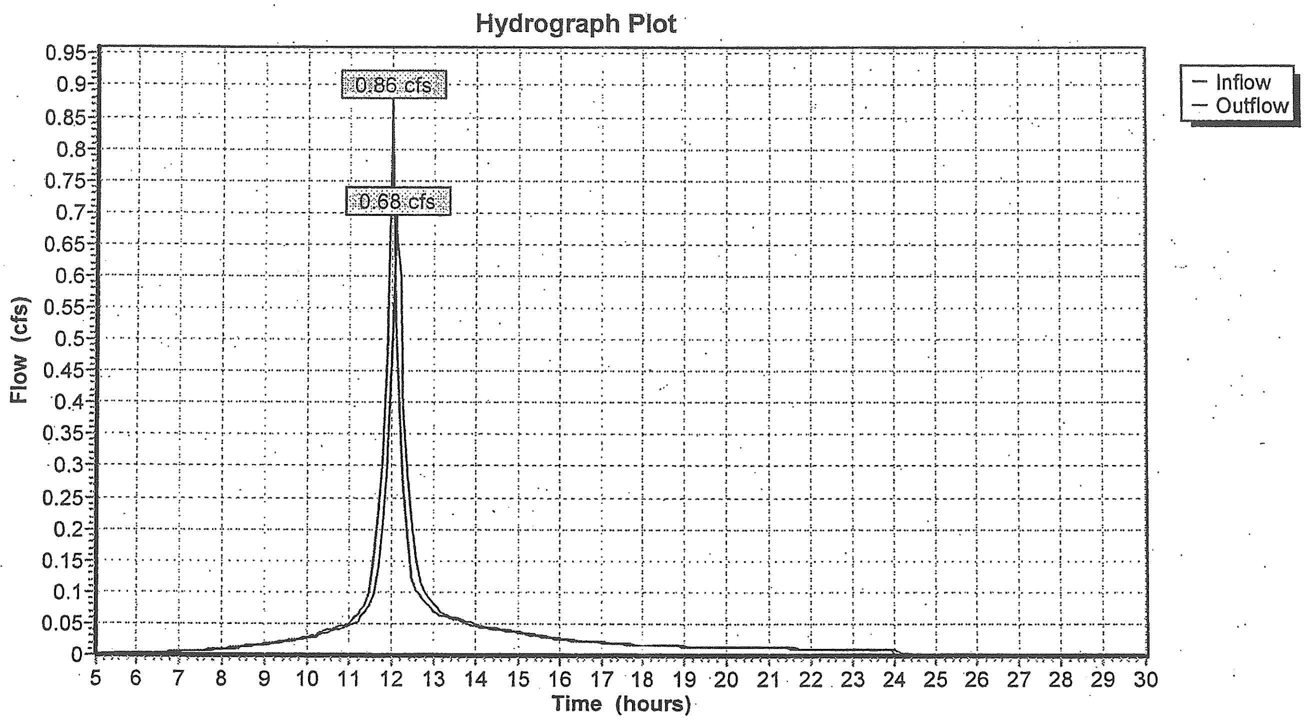
Reach R25: 24 to Dry Swale

Inflow	=	0.86 cfs @	12.00 hrs, Volume=	0.062 af
Outflow	=	0.68 cfs @	12.12 hrs, Volume=	0.062 af, Atten= 21%, Lag= 7.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.4 fps, Min. Travel Time= 4.0 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 13.2 min

Peak Depth= 0.49'
Capacity at bank full= 7.62 cfs
Inlet Invert= 39.50', Outlet Invert= 34.00'
2.00' x 1.50' deep channel, n= 0.400 Length= 100.0' Slope= 0.0550 '/'
Side Slope Z-value= 3.0 '/'

Reach R25: 24 to Dry Swale



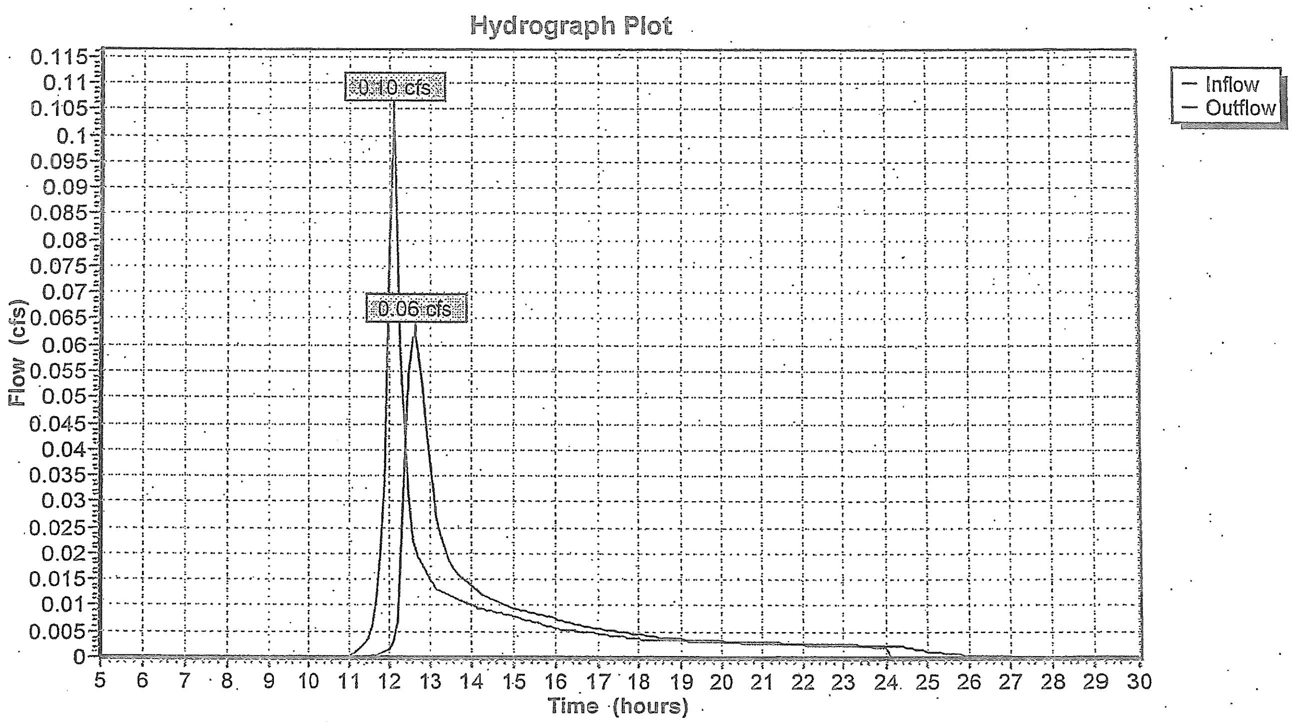
Reach R26: From 26 to SP

Inflow	=	0.10 cfs @	12.10 hrs, Volume=	0.009 af
Outflow	=	0.06 cfs @	12.63 hrs, Volume=	0.009 af, Atten= 41%, Lag= 31.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.2 fps, Min. Travel Time= 19.6 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 50.6 min

Peak Depth= 0.12'
Capacity at bank full= 10.11 cfs
Inlet Invert= 35.00', Outlet Invert= 29.50'
3.00' x 2.00' deep channel, n= 0.400 Length= 180.0' Slope= 0.0306 '/'
Side Slope Z-value= 2.0 '/'

Reach R26: From 26 to SP



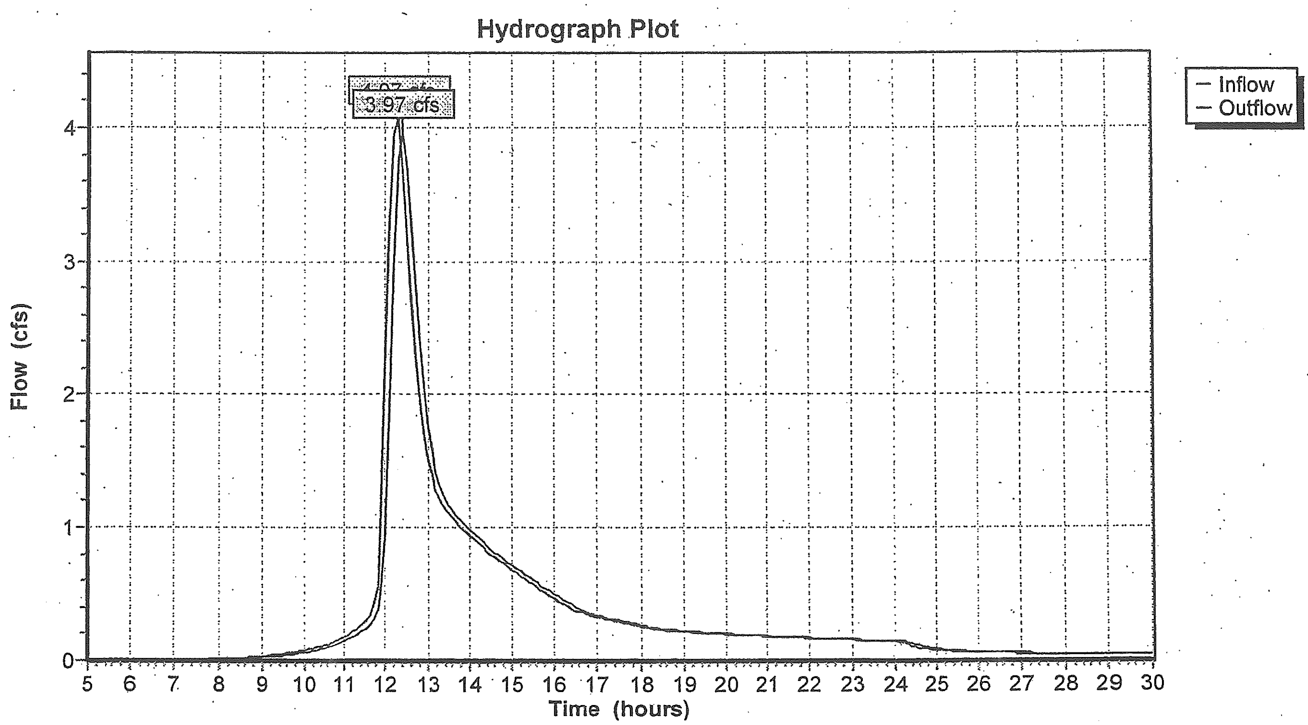
Reach SP: Study Point

Inflow = 4.07 cfs @ 12.27 hrs, Volume= 0.680 af
Outflow = 3.97 cfs @ 12.40 hrs, Volume= 0.679 af, Atten= 2%, Lag= 7.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.4 fps, Min. Travel Time= 4.2 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 12.6 min

Peak Depth= 0.28'
Capacity at bank full= 239.77 cfs
Inlet Invert= 29.50', Outlet Invert= 29.40'
35.00' x 3.00' deep channel, n= 0.050 Length= 100.0' Slope= 0.0010 '/'
Side Slope Z-value= 5.0 4.0 '/'

Reach SP: Study Point



Pond P11: Existing Satellite Lot Detention Pond

Inflow	=	0.89 cfs @	11.99 hrs,	Volume=	0.065 af
Outflow	=	0.17 cfs @	12.42 hrs,	Volume=	0.064 af, Atten= 81%, Lag= 25.5 min
Primary	=	0.17 cfs @	12.42 hrs,	Volume=	0.064 af
Secondary	=	0.00 cfs @	5.00 hrs,	Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 48.47' Storage= 917 cf
Plug-Flow detention time= 55.7 min calculated for 0.064 af (98% of inflow)
Storage and wetted areas determined by Prismatic sections

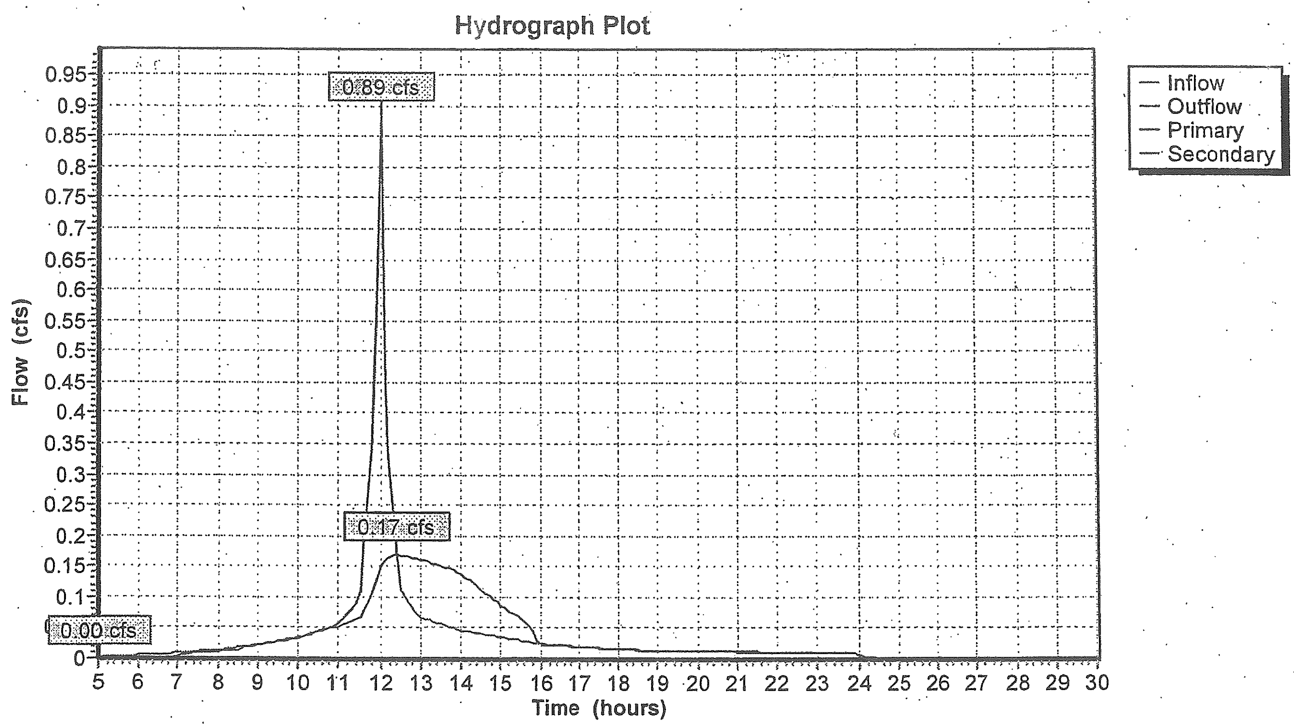
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.00	10	0	0
47.00	117	64	64
48.00	674	396	459
49.00	1,276	975	1,434

Primary OutFlow (Free Discharge)
├—1=Orifice/Grate
└—2=Orifice/Grate

Secondary OutFlow (Free Discharge)
└—3=Sharp-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	46.50'	**1.0" Vert. Orifice/Grate** C= 0.600
2	Primary	46.80'	**2.0" Vert. Orifice/Grate** C= 0.600
3	Secondary	48.50'	**3.1' long x 0.5' high Sharp-Crested Rectangular Weir** 0 End Contraction(s)

Pond P11: Existing Satellite Lot Detention Pond



Pond P15: Pond 15

Inflow =	1.15 cfs @	11.99 hrs, Volume=	0.083 af	
Outflow =	0.45 cfs @	12.25 hrs, Volume=	0.059 af,	Atten= 61%, Lag= 15.6 min
Primary =	0.03 cfs @	12.25 hrs, Volume=	0.034 af	
Secondary =	0.42 cfs @	12.25 hrs, Volume=	0.025 af	

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 40.58' Storage= 1,744 cf
Plug-Flow detention time= 326.5 min calculated for 0.059 af (71% of inflow)
Storage and wetted areas determined by Prismatic sections

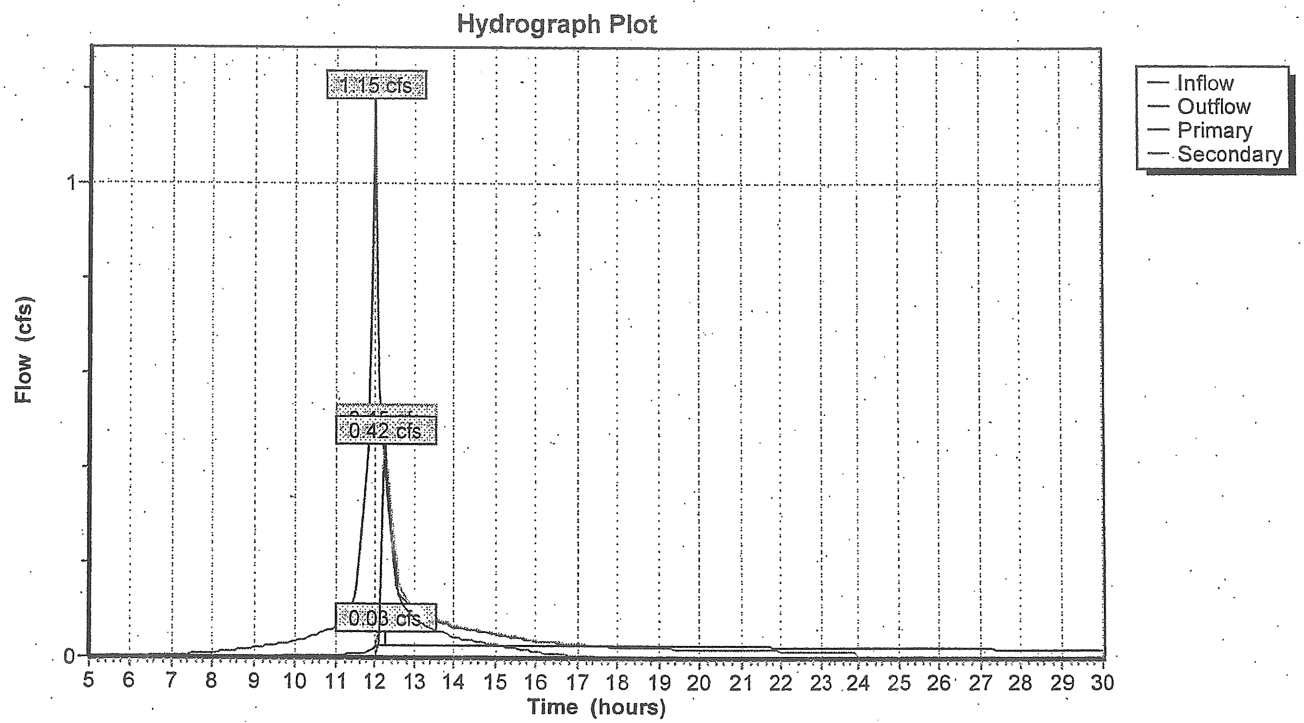
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.00	724	0	0
40.00	1,189	957	957
40.50	1,443	658	1,615
41.00	1,711	789	2,403
42.00	2,290	2,001	4,404

Primary OutFlow (Free Discharge)
└─2=Culvert
  └─1=Exfiltration

Secondary OutFlow (Free Discharge)
└─3=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Device 2	39.00'	**0.002000 fpm Exfiltration over Surface area above invert**
2	Primary	36.50'	**6.0" x 80.0' long Culvert** RCP, groove end projecting, Ke= 0.200 Outlet Invert= 35.00' S= 0.0187 '/' n= 0.011 Cc= 0.900
3	Secondary	40.50'	**7.0' long x 13.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.62 2.66 2.70 2.66 2.65 2.66 2.65 2.63

Pond P15: Pond 15



Pond P16: Pond 16

Inflow =	0.42 cfs @ 11.99 hrs,	Volume=	0.029 af
Outflow =	0.11 cfs @ 12.38 hrs,	Volume=	0.023 af, Atten= 74%, Lag= 23.3 min
Primary =	0.01 cfs @ 12.38 hrs,	Volume=	0.017 af
Secondary =	0.10 cfs @ 12.38 hrs,	Volume=	0.006 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 45.55' Storage= 595 cf
Plug-Flow detention time= 339.2 min calculated for 0.023 af (80% of inflow)
Storage and wetted areas determined by Prismatic sections

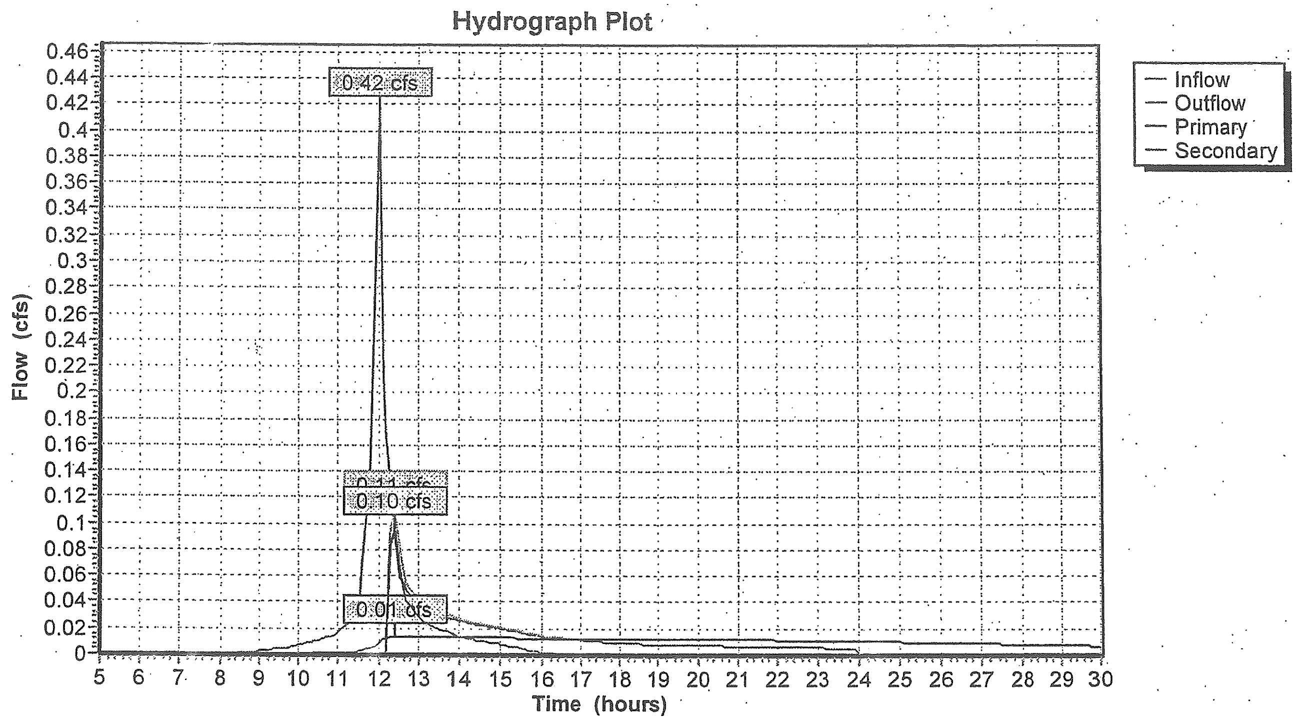
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.00	190	0	0
45.00	430	310	310
45.50	573	251	561
46.00	751	331	892
47.00	1,145	948	1,840

Primary OutFlow (Free Discharge)
└─2=Culvert
  └─1=Exfiltration

Secondary OutFlow (Free Discharge)
└─3=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Device 2	44.00'	**0.002000 fpm Exfiltration over Surface area above invert**
2	Primary	41.50'	**6.0" x 50.0' long Culvert** RCP, groove end projecting, Ke= 0.200 Outlet Invert= 41.00' S= 0.0100 '/' n= 0.011 Cc= 0.900
3	Secondary	45.50'	**3.0' long x 13.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.62 2.66 2.70 2.66 2.65 2.66 2.65 2.63

Pond P16: Pond 16



Pond P23: Pond 23

Inflow =	1.32 cfs @	12.02 hrs, Volume=	0.109 af	
Outflow =	0.30 cfs @	12.43 hrs, Volume=	0.107 af,	Atten= 77%, Lag= 24.9 min
Primary =	0.30 cfs @	12.43 hrs, Volume=	0.107 af	
Secondary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 40.67' Storage= 1,900 cf
Plug-Flow detention time= 121.1 min calculated for 0.107 af (98% of inflow)
Storage and wetted areas determined by Prismatic sections

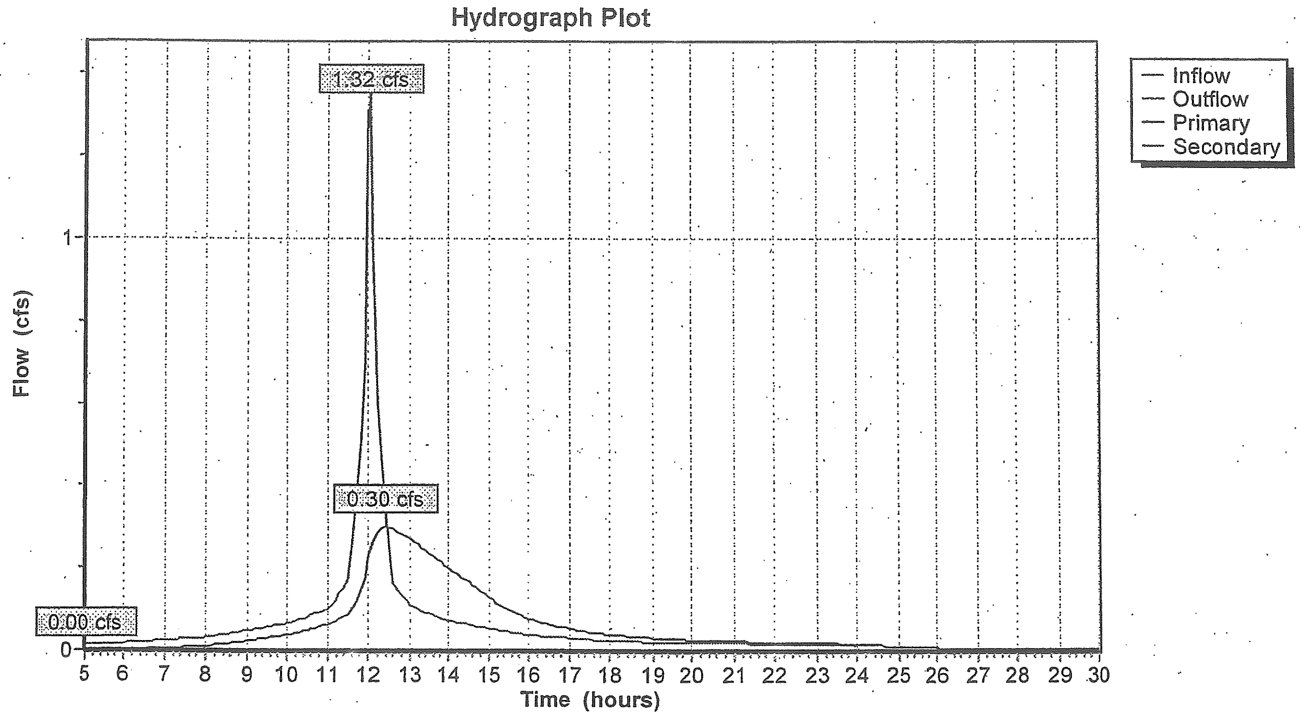
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
40.00	2,820	0	0
42.00	2,820	5,640	5,640

Primary OutFlow (Free Discharge)
└─1=Culvert

Secondary OutFlow (Free Discharge)
└─2=Culvert

#	Routing	Invert	Outlet Devices
1	Primary	40.00'	**4.0" x 10.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 39.50' S= 0.0500 '/' n= 0.011 Cc= 0.900
2	Secondary	41.00'	**12.0" x 10.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 39.50' S= 0.1500 '/' n= 0.011 Cc= 0.900

Pond P23: Pond 23



Pond P24: Dry Swale

Inflow =	1.14 cfs @	12.05 hrs, Volume=	0.106 af	
Outflow =	1.12 cfs @	12.09 hrs, Volume=	0.093 af,	Atten= 2%, Lag= 2.9 min
Primary =	0.02 cfs @	12.09 hrs, Volume=	0.028 af	
Secondary =	1.09 cfs @	12.09 hrs, Volume=	0.065 af	

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 35.66' Storage= 1,055 cf
Plug-Flow detention time= 157.4 min calculated for 0.093 af (88% of inflow)
Storage and wetted areas determined by Prismatic sections

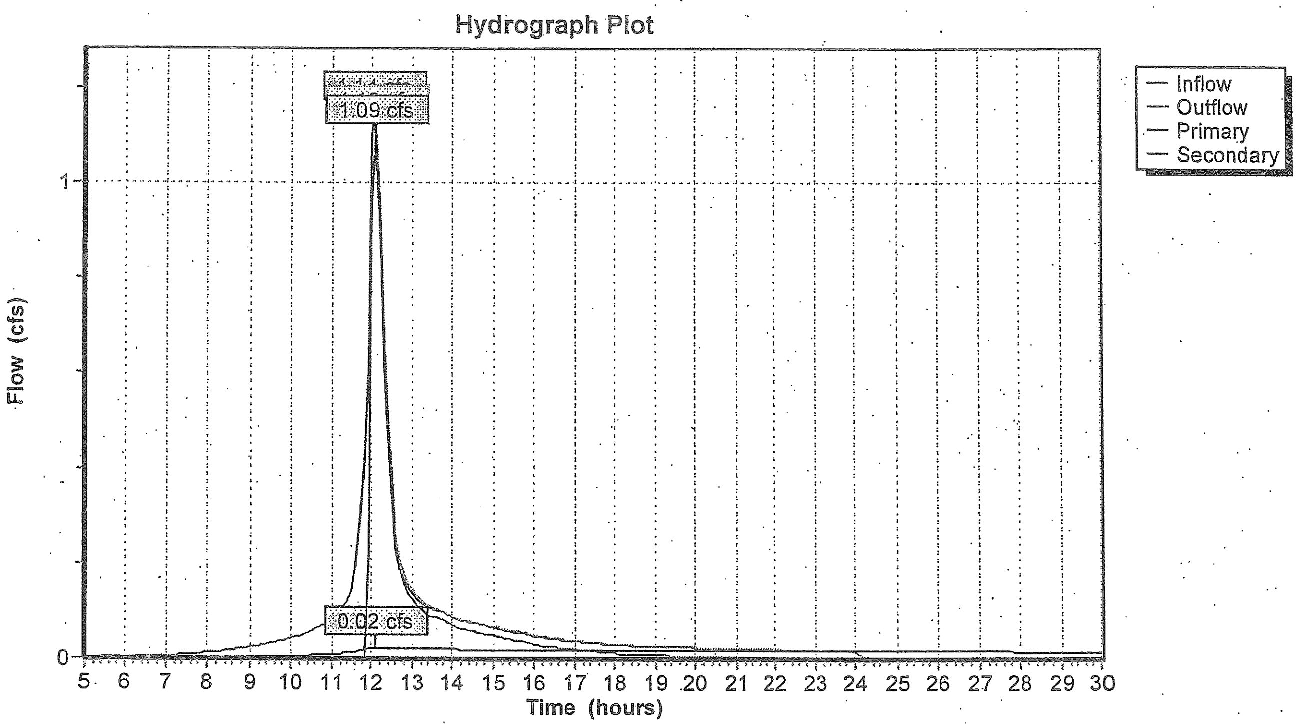
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.00	329	0	0
35.00	681	505	505
35.50	878	390	895
36.00	1,090	492	1,387

Primary OutFlow (Free Discharge)
└─2=Culvert
  └─1=Exfiltration

Secondary OutFlow (Free Discharge)
└─3=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Device 2	34.00'	**0.002000 fpm Exfiltration over Surface area above invert**
2	Primary	32.50'	**6.0" x 50.0' long Culvert** CMP, projecting, no headwall, Ke= 0.900 Outlet Invert= 32.00' S= 0.0100 '/' n= 0.010 Cc= 0.900
3	Secondary	35.50'	**7.0' long x 6.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4 Coef. (English) 2.38 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.6

Pond P24: Dry Swale



Time span=5.00-30.00 hrs, dt=0.10 hrs, 251 points
Runoff by SCS TR-20 method, UH=SCS, Type III 24-hr Rainfall=4.70"
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 11S: Satellite Parking
Tc=2.1 min CN=95 Area=0.320 ac Runoff= 1.44 cfs 0.109 af

Subcatchment 12S: North/West of Satellite
Tc=4.8 min CN=81 Area=0.590 ac Runoff= 1.78 cfs 0.134 af

Subcatchment 13S: Proposed NORTH-CENTRAL
Tc=9.7 min CN=75 Area=0.670 ac Runoff= 1.46 cfs 0.123 af

Subcatchment 14S: Proposed Northeast
Tc=14.2 min CN=76 Area=0.590 ac Runoff= 1.16 cfs 0.113 af

Subcatchment 15S: Proposed Parking
Tc=1.4 min CN=91 Area=0.480 ac Runoff= 1.99 cfs 0.147 af

Subcatchment 16S: Proposed Parking
Tc=1.5 min CN=85 Area=0.220 ac Runoff= 0.80 cfs 0.057 af

Subcatchment 21S: Proposed Central
Tc=8.6 min CN=76 Area=0.530 ac Runoff= 1.22 cfs 0.101 af

Subcatchment 22S: Existing Parking and Entrance Circle
Tc=11.8 min CN=85 Area=0.860 ac Runoff= 2.49 cfs 0.222 af

Subcatchment 23S: Proposed Buildings
Tc=5.0 min CN=98 Area=0.480 ac Runoff= 2.08 cfs 0.174 af

Subcatchment 24S: Expanded Parking
Tc=3.8 min CN=89 Area=0.280 ac Runoff= 1.11 cfs 0.081 af

Subcatchment 25S: Access & Rear Parking
Tc=3.2 min CN=93 Area=0.330 ac Runoff= 1.44 cfs 0.107 af

Subcatchment 26S: Rear of Building
Tc=7.8 min CN=74 Area=0.120 ac Runoff= 0.26 cfs 0.021 af

Reach 1R: Existing Swale
Inflow= 8.08 cfs 0.980 af
Length= 200.0' Max Vel= 1.1 fps Capacity= 43.53 cfs Outflow= 7.70 cfs 0.979 af

Reach 2R: Existing Swale
Inflow= 5.19 cfs 0.565 af
Length= 80.0' Max Vel= 1.7 fps Capacity= 144.69 cfs Outflow= 5.04 cfs 0.565 af

Reach 3R: Existing Swale
Inflow= 2.03 cfs 0.242 af
Length= 120.0' Max Vel= 1.2 fps Capacity= 63.42 cfs Outflow= 2.02 cfs 0.242 af

Reach R11: From P11 to Swale Inflow= 1.13 cfs 0.108 af
Length= 70.0' Max Vel= 0.4 fps Capacity= 33.01 cfs Outflow= 0.86 cfs 0.108 af

Reach R12: 48" RCP Inflow= 1.78 cfs 0.134 af
Length= 90.0' Max Vel= 8.8 fps Capacity= 463.95 cfs Outflow= 1.74 cfs 0.134 af

Reach R15: From P15 to Swale Inflow= 1.81 cfs 0.121 af
Length= 100.0' Max Vel= 0.3 fps Capacity= 45.62 cfs Outflow= 1.50 cfs 0.120 af

Reach R16: From P16 to Swale Inflow= 0.74 cfs 0.050 af
Length= 120.0' Max Vel= 0.2 fps Capacity= 28.43 cfs Outflow= 0.48 cfs 0.049 af

Reach R22: From 22 to Swale Inflow= 2.49 cfs 0.222 af
Length= 90.0' Max Vel= 0.5 fps Capacity= 27.37 cfs Outflow= 2.26 cfs 0.222 af

Reach R23: From 25 to Swale Inflow= 0.42 cfs 0.172 af
Length= 50.0' Max Vel= 0.3 fps Capacity= 28.77 cfs Outflow= 0.42 cfs 0.172 af

Reach R25: 24 to Dry Swale Inflow= 1.44 cfs 0.107 af
Length= 100.0' Max Vel= 0.5 fps Capacity= 7.62 cfs Outflow= 1.15 cfs 0.107 af

Reach R26: From 26 to SP Inflow= 0.26 cfs 0.021 af
Length= 180.0' Max Vel= 0.2 fps Capacity= 10.11 cfs Outflow= 0.18 cfs 0.021 af

Reach SP: Study Point Inflow= 10.62 cfs 1.337 af
Length= 100.0' Max Vel= 0.6 fps Capacity= 239.77 cfs Outflow= 10.27 cfs 1.336 af

Pond P11: Existing Satellite Lot Detention Pond Peak Storage= 1,141 cf Inflow= 1.44 cfs 0.109 af
Primary= 0.18 cfs 0.090 af Secondary= 0.95 cfs 0.019 af Outflow= 1.13 cfs 0.108 af

Pond P15: Pond 15 Peak Storage= 1,948 cf Inflow= 1.99 cfs 0.147 af
Primary= 0.03 cfs 0.038 af Secondary= 1.78 cfs 0.084 af Outflow= 1.81 cfs 0.121 af

Pond P16: Pond 16 Peak Storage= 697 cf Inflow= 0.80 cfs 0.057 af
Primary= 0.02 cfs 0.019 af Secondary= 0.72 cfs 0.031 af Outflow= 0.74 cfs 0.050 af

Pond P23: Pond 23 Peak Storage= 3,028 cf Inflow= 2.08 cfs 0.174 af
Primary= 0.40 cfs 0.171 af Secondary= 0.02 cfs 0.001 af Outflow= 0.42 cfs 0.172 af

Pond P24: Dry Swale Peak Storage= 1,131 cf Inflow= 2.05 cfs 0.188 af
Primary= 0.02 cfs 0.031 af Secondary= 1.98 cfs 0.144 af Outflow= 2.00 cfs 0.175 af

Runoff Area = 5.470 ac Volume = 1.389 af Average Depth = 3.05"

Subcatchment 11S: Satellite Parking

Runoff = 1.44 cfs @ 11.99 hrs, Volume= 0.109 af

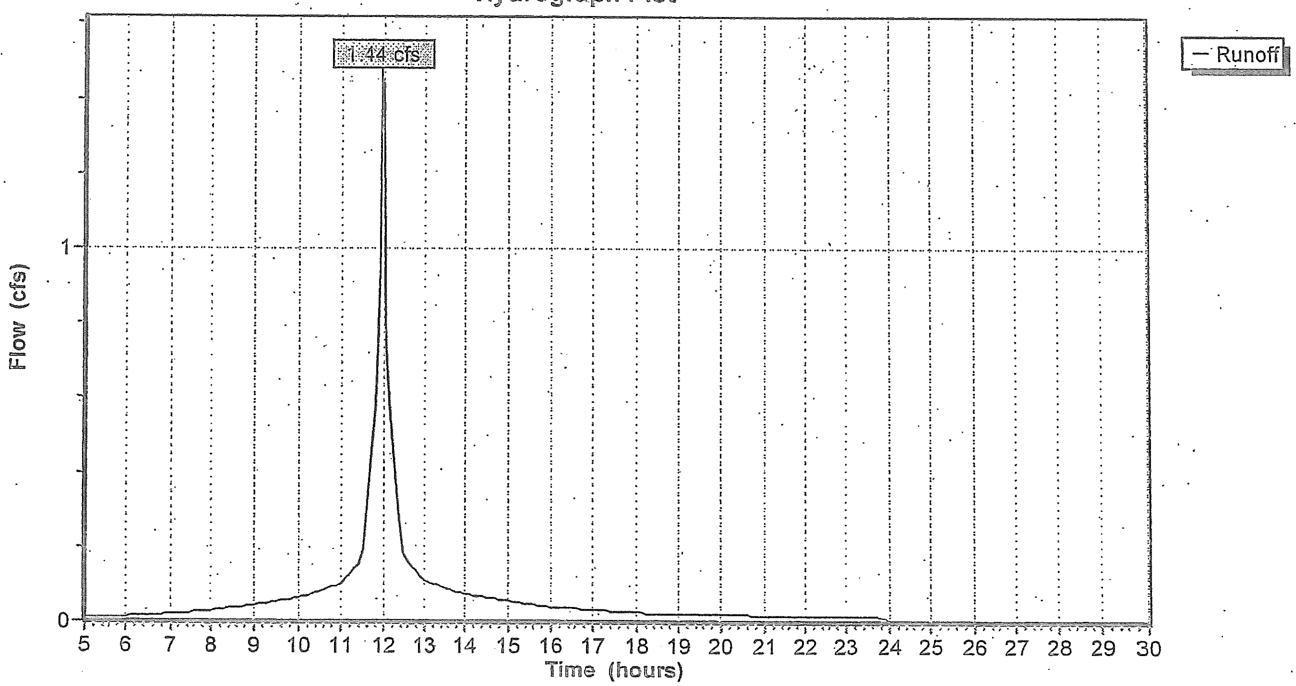
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.270	98	IMPERVIOUS (PARKING LOT)
0.040	74	OPEN SPACE (GOOD)-HSG "C"
0.010	89	RIP RAP-HSG "C"
0.320	95	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0303	1.6		**Sheet Flow, Segment ID:AB** Smooth surfaces n= 0.011 P2= 3.00"
0.1	15	0.3300	4.0		**Shallow Concentrated Flow, Segment ID:BC** Kv= 7.0 fps
0.9	55	0.0200	1.0		**Shallow Concentrated Flow, Segment ID:CD** Short Grass Pasture Kv= 7.0 fps
2.1	170	Total			

Subcatchment 11S: Satellite Parking

Hydrograph Plot



Subcatchment 12S: North/West of Satellite

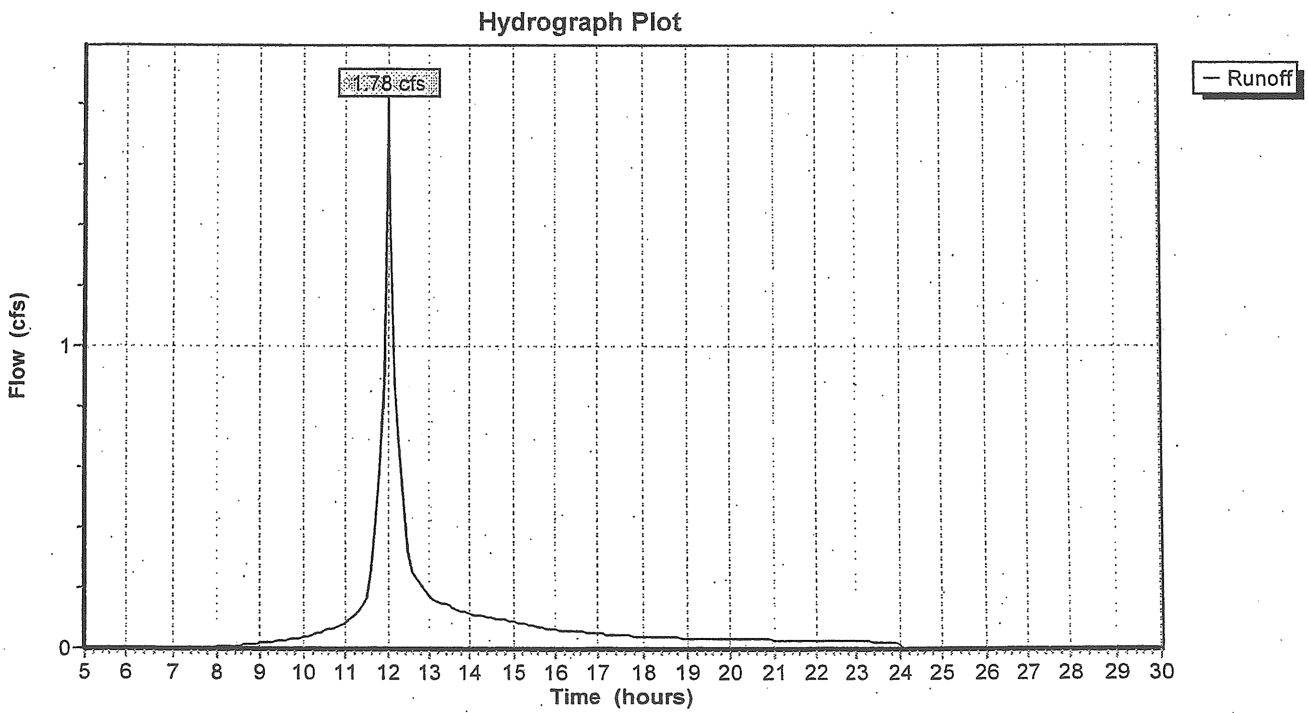
Runoff = 1.78 cfs @ 12.02 hrs, Volume= 0.134 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.020	73	WOODS (FAIR)-HSG "C"
0.400	74	OPEN SPACE (GOOD)-HSG "C"
0.170	98	IMPERVIOUS
0.590	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	16	0.1900	0.2		**Sheet Flow, Segment ID:AB** Grass: Dense n= 0.240 P2= 3.00"
0.8	13	0.5000	0.3		**Sheet Flow, Segment ID:BC** Grass: Dense n= 0.240 P2= 3.00"
1.3	185	0.0270	2.5		**Shallow Concentrated Flow, Segment ID:CD** Grassed Waterway Kv= 15.0 fps
0.2	60	0.0100	5.7	7.00	**Circular Channel (pipe), SEGMENT ID:DE** Diam= 15.0" Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
1.1	165	0.0300	2.6		**Shallow Concentrated Flow, SEGMENT ID:EF** Grassed Waterway Kv= 15.0 fps
4.8	439	Total			

Subcatchment 12S: North/West of Satellite



Subcatchment 13S: Proposed NORTH-CENTRAL

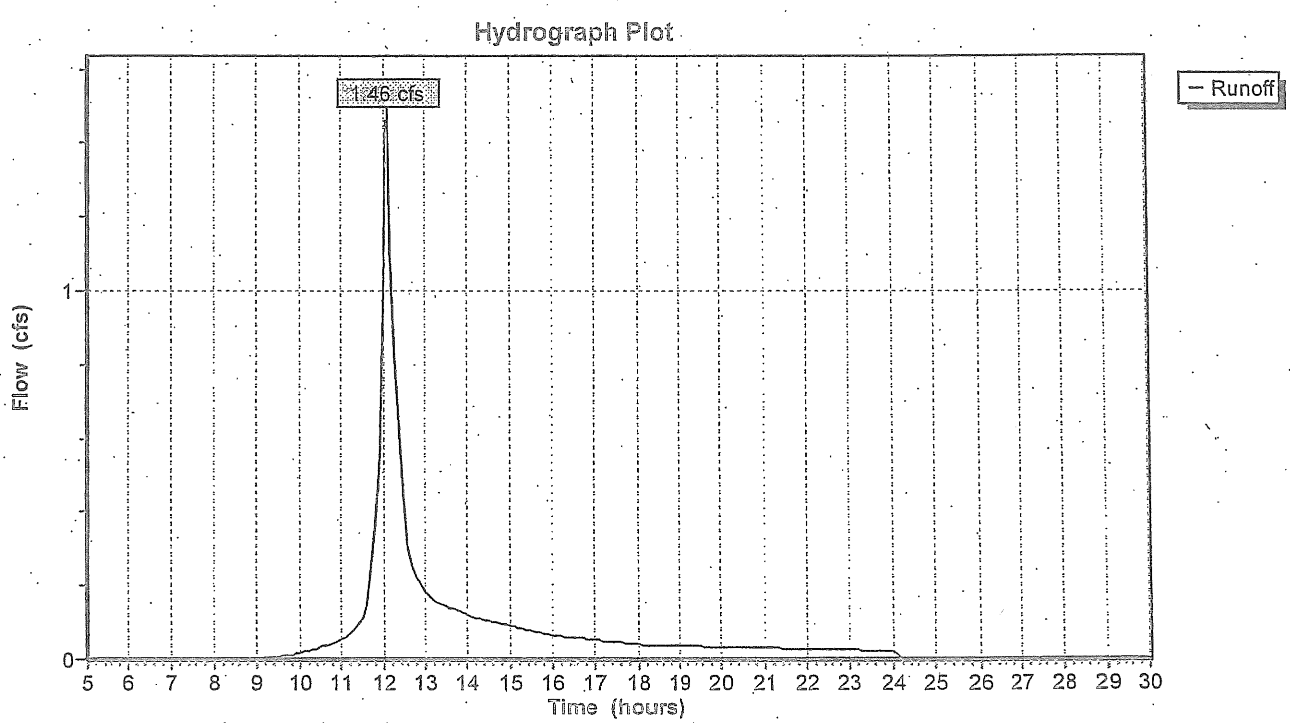
Runoff = 1.46 cfs @ 12.10 hrs, Volume= 0.123 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.300	73	WOODS (FAIR)-HSG "C"
0.130	74	OPEN SPACE (GOOD)-HSG "C"
0.240	79	WOODS (FAIR)-HSG "D"
0.670	75	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	5	0.5000	0.3		**Sheet Flow, Segment ID:AB** Grass: Short n= 0.150 P2= 3.00"
7.2	65	0.1400	0.2		**Sheet Flow, Segment ID:BC** Woods: Light underbrush n= 0.400 P2= 3.00"
0.5	45	0.1000	1.6		**Shallow Concentrated Flow, SegmentC-D** Woodland Kv= 5.0 fps
1.7	100	0.0400	1.0		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
9.7	215	Total			

Subcatchment 13S: Proposed NORTH-CENTRAL



Subcatchment 14S: Proposed Northeast

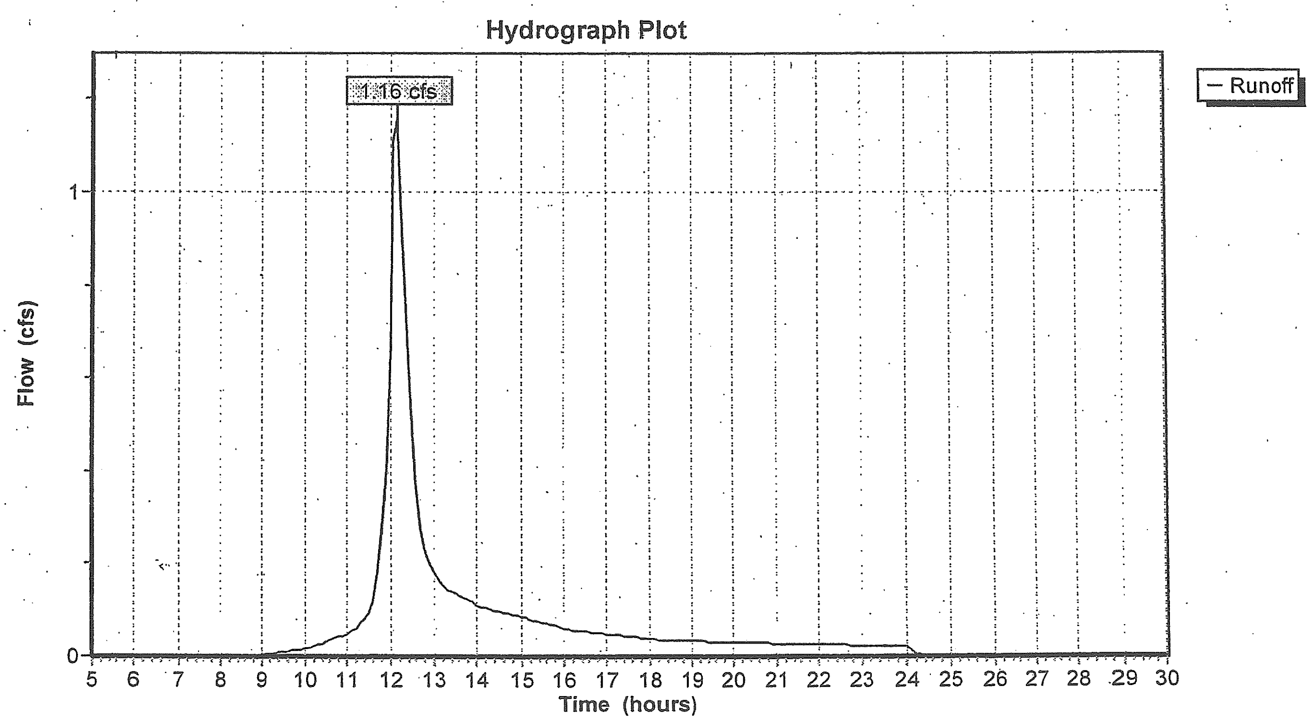
Runoff = 1.16 cfs @ 12.16 hrs, Volume= 0.113 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.240	73	Woods, Fair, HSG C
0.230	79	Woods, Fair, HSG D
0.120	74	>75% Grass cover, Good, HSG C
0.590	76	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	15	0.1333	0.2		**Sheet Flow, Segment AB** Grass: Short n= 0.150 P2= 3.00"
0.4	10	0.5000	0.4		**Sheet Flow, SegmentBC** Grass: Short n= 0.150 P2= 3.00"
3.9	45	0.3100	0.2		**Sheet Flow, Segment CD** Woods: Light underbrush n= 0.400 P2= 3.00"
6.9	30	0.0333	0.1		**Sheet Flow, DE** Woods: Light underbrush n= 0.400 P2= 3.00"
2.0	70	0.0140	0.6		**Shallow Concentrated Flow, SegmentDE** Woodland Kv= 5.0 fps
14.2	170	Total			

Subcatchment 14S: Proposed Northeast



Subcatchment 15S: Proposed Parking

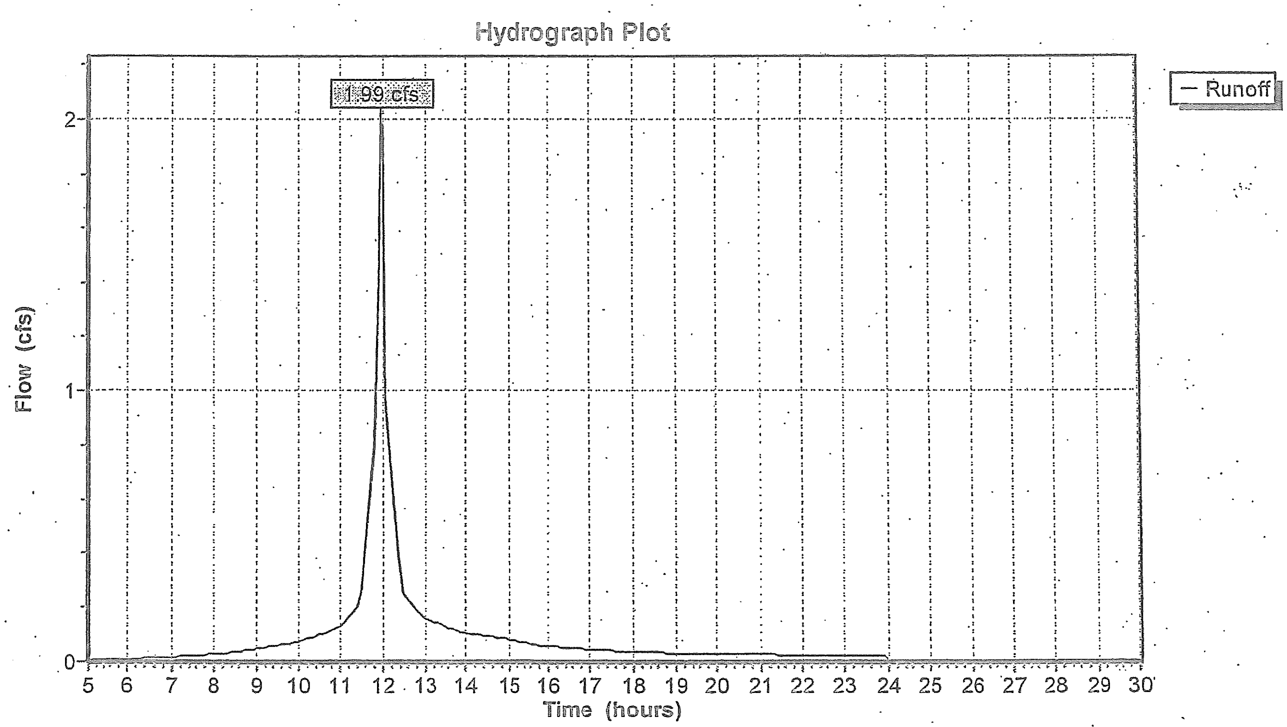
Runoff = 1.99 cfs @ 11.99 hrs, Volume= 0.147 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.340	98	Paved parking & roofs
0.140	74	>75% Grass cover, Good, HSG C
0.480	91	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0333	1.6		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.4	100	0.0333	3.7		**Shallow Concentrated Flow, BD** Paved Kv= 20.3 fps
1.4	200	Total			

Subcatchment 15S: Proposed Parking



Subcatchment 16S: Proposed Parking

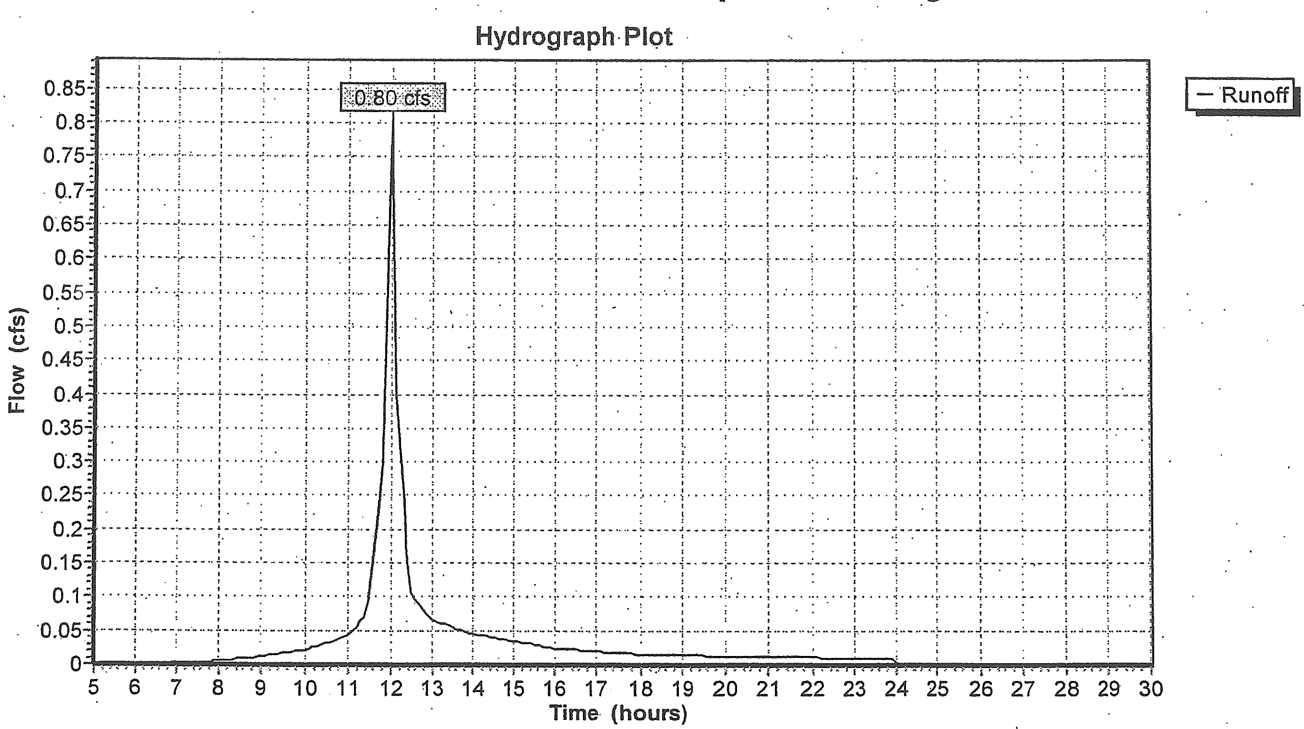
Runoff = 0.80 cfs @ 11.99 hrs, Volume= 0.057 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.100	98	Paved parking & roofs
0.120	74	>75% Grass cover, Good, HSG C
0.220	85	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	95	0.0333	1.6		**Sheet Flow, Segment AB** Smooth surfaces n= 0.011 P2= 3.00"
0.2	35	0.0300	3.5		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
0.3	50	0.1400	2.6		**Shallow Concentrated Flow, Segment CD** Short Grass Pasture Kv= 7.0 fps
1.5	180	Total			

Subcatchment 16S: Proposed Parking



Subcatchment 21S: Proposed Central

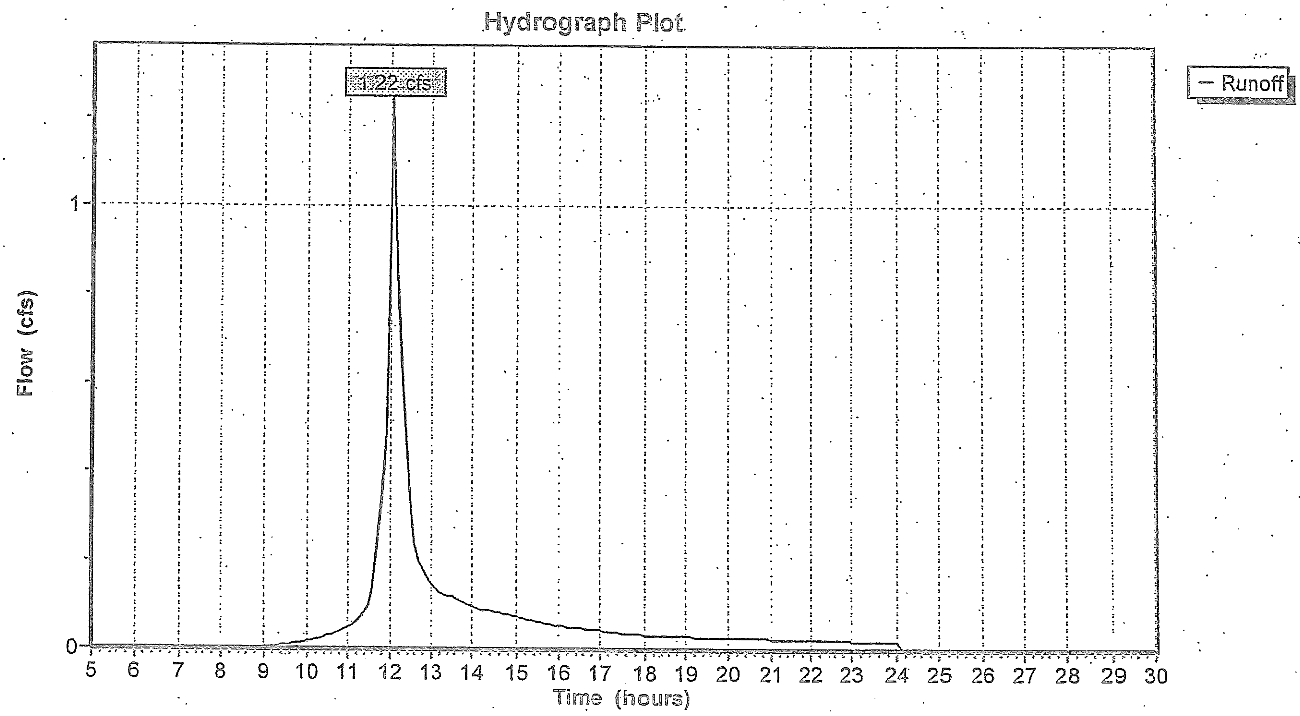
Runoff = 1.22 cfs @ 12.09 hrs, Volume= 0.101 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.180	73	WOODS (FAIR)-HSG "C"
0.150	74	OPEN SPACE (GOODG "C"
0.200	79	WOODS (FAIR)-HSD "D"
0.530	76	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	60	0.0417	0.2		**Sheet Flow, SegmentAB** Grass: Short n= 0.150 P2= 3.00"
2.2	40	0.1500	0.3		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
0.2	30	0.2700	2.6		**Shallow Concentrated Flow, Segment ID:CD** Woodland Kv= 5.0 fps
1.2	80	0.0500	1.1		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
8.6	210	Total			

Subcatchment 21S: Proposed Central



Subcatchment 22S: Existing Parking and Entrance Circle

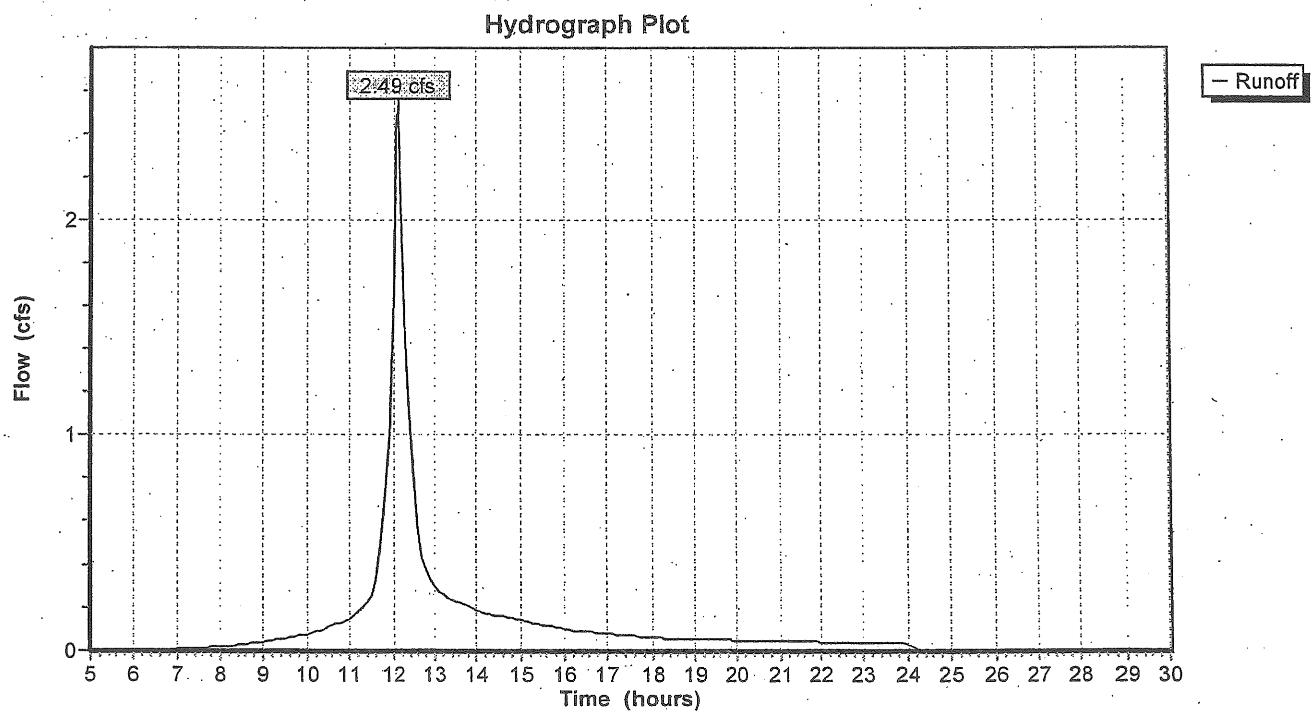
Runoff = 2.49 cfs @ 12.12 hrs, Volume= 0.222 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.070	73	WOODS (FAIR)-HSG "C"
0.400	74	OPEN SPACE (GOODG "C"
0.390	98	IMPERVIOUS (BLDG, PAVEMENT)
0.860	85	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0167	0.1		**Sheet Flow, Segment ID:AB** Grass: Short n= 0.150 P2= 3.00"
0.4	20	0.0125	0.8		**Sheet Flow, SegmentBC** Smooth surfaces n= 0.011 P2= 3.00"
7.9	65	0.1100	0.1		**Sheet Flow, SegmentCD** Woods: Light underbrush n= 0.400 P2= 3.00"
0.8	75	0.0880	1.5		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
0.3	180	0.0330	9.7	7.65	**Circular Channel (pipe), SegmentEF** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011
11.8	355	Total			

Subcatchment 22S: Existing Parking and Entrance Circle



Subcatchment 23S: Proposed Buildings

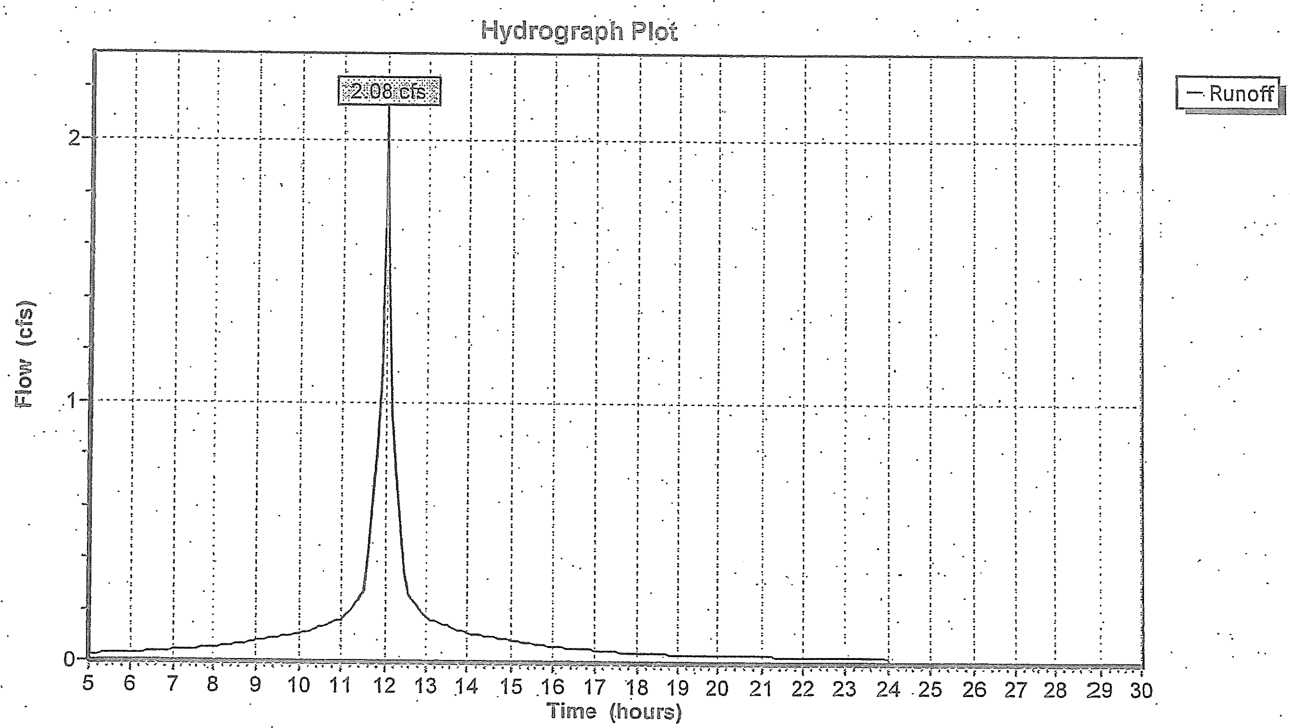
Runoff = 2.08 cfs @ 12.02 hrs, Volume= 0.174 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.480	98	Paved parking & roofs

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

Subcatchment 23S: Proposed Buildings



Subcatchment 24S: Expanded Parking

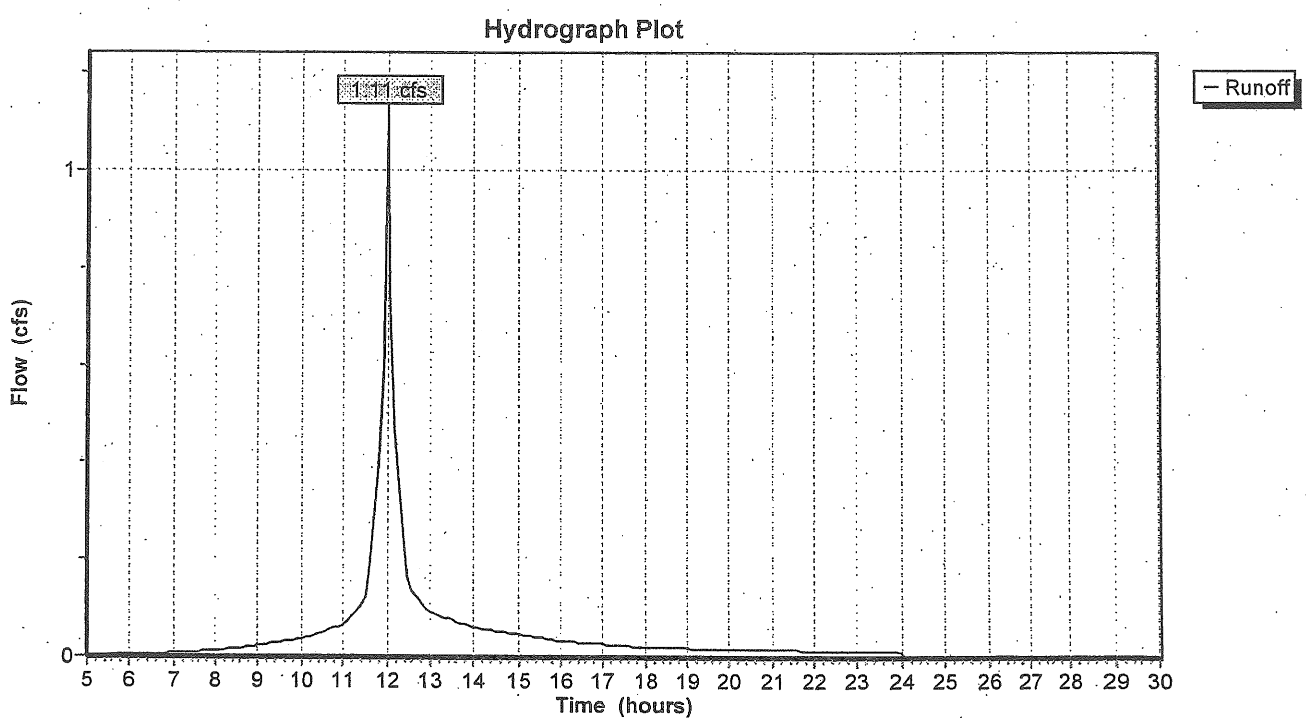
Runoff = 1.11 cfs @ 12.01 hrs, Volume= 0.081 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.170	98	Paved parking & roofs
0.110	74	>75% Grass cover, Good, HSG C
0.280	89	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	10	0.0100	0.1		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.00"
0.6	10	0.2000	0.3		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
0.7	80	0.0600	2.0		**Sheet Flow, CD** Smooth surfaces n= 0.011 P2= 3.00"
0.4	100	0.0400	4.1		**Shallow Concentrated Flow, DE** Paved Kv= 20.3 fps
3.8	200	Total			

Subcatchment 24S: Expanded Parking



Subcatchment 25S: Access & Rear Parking

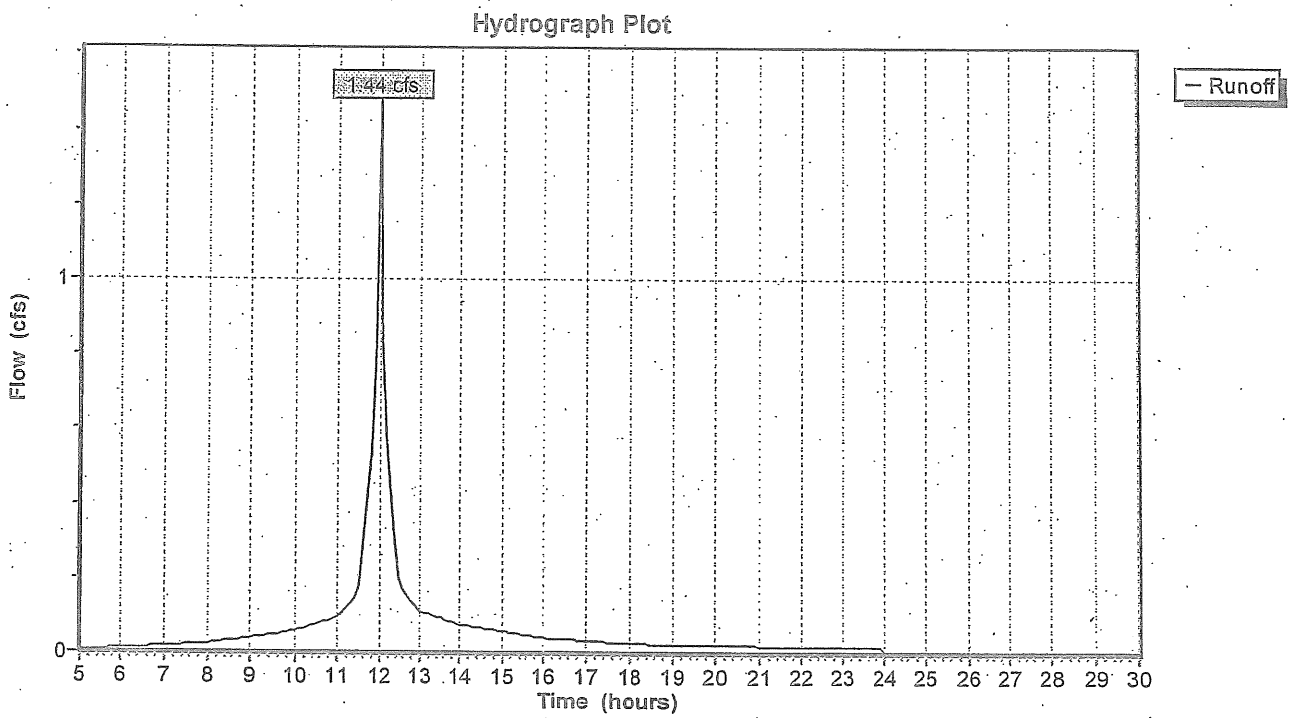
Runoff = 1.44 cfs @ 12.00 hrs, Volume= 0.107 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.260	98	Paved parking & roofs
0.070	74	>75% Grass cover, Good, HSG C
0.330	93	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	15	0.0333	0.1		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.00"
0.8	85	0.0400	1.7		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.00"
0.6	110	0.0250	3.2		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
3.2	210	Total			

Subcatchment 25S: Access & Rear Parking



Subcatchment 26S: Rear of Building

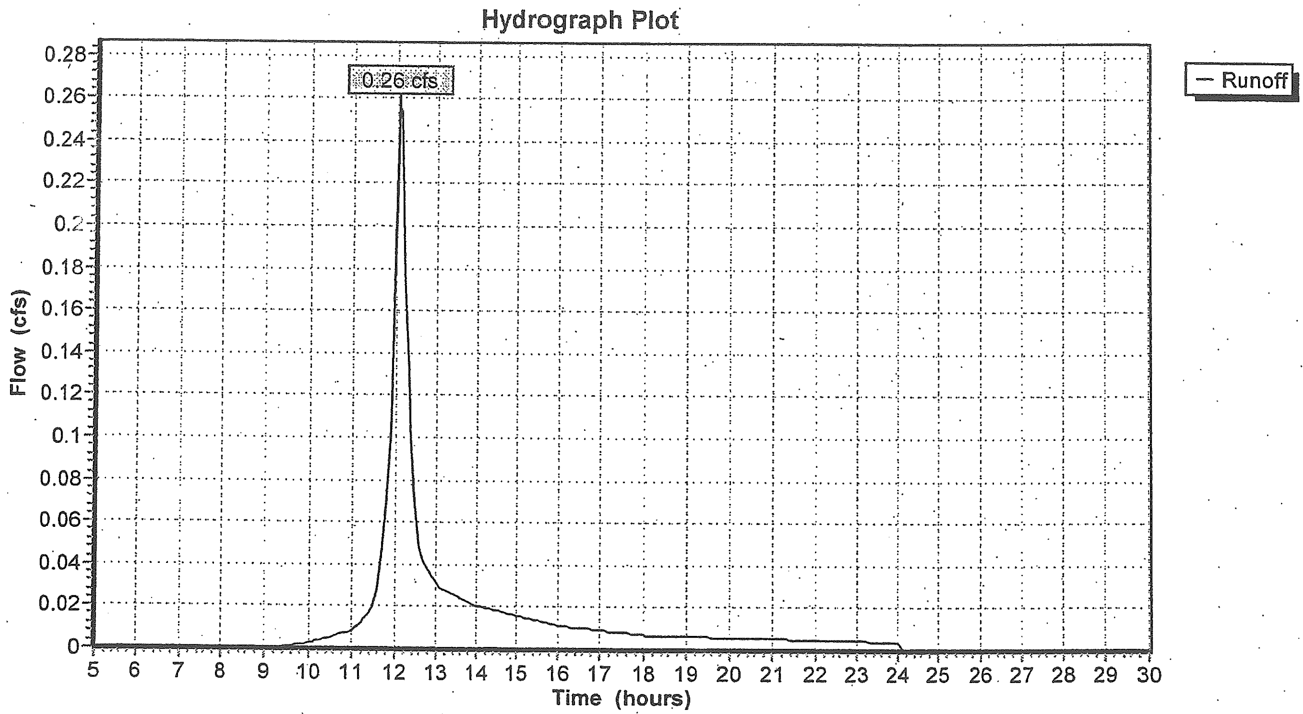
Runoff = 0.26 cfs @ 12.08 hrs, Volume= 0.021 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=4.70"

Area (ac)	CN	Description
0.120	74	>75% Grass cover, Good, HSG C

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	10	0.2000	0.3		**Sheet Flow, Segment AB** Grass: Short n= 0.150 P2= 3.00"
6.4	90	0.0500	0.2		**Sheet Flow, Segment BC** Grass: Short n= 0.150 P2= 3.00"
0.8	100	0.0900	2.1		**Shallow Concentrated Flow, Segment CD** Short Grass Pasture Kv= 7.0 fps
7.8	200	Total			

Subcatchment 26S: Rear of Building

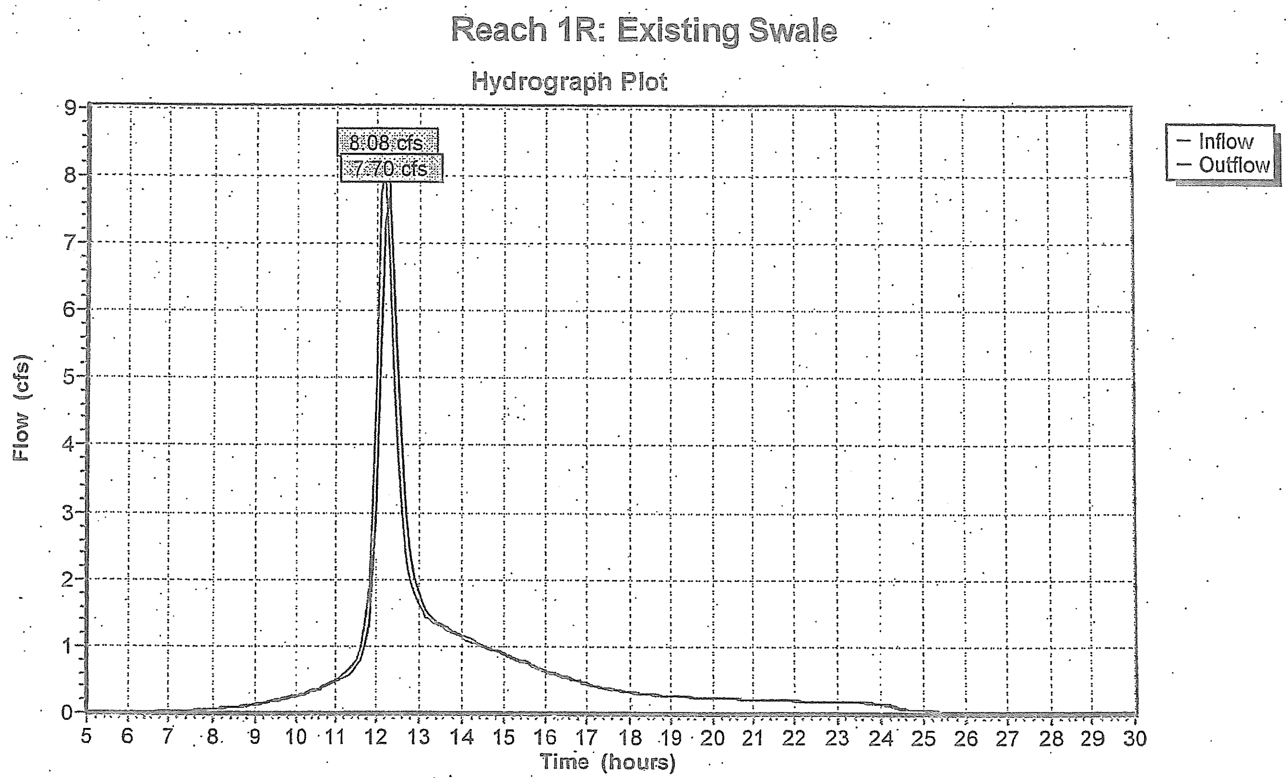


Reach 1R: Existing Swale

Inflow	=	8.08 cfs @ 12.17 hrs,	Volume=	0.980 af
Outflow	=	7.70 cfs @ 12.27 hrs,	Volume=	0.979 af, Atten= 5%, Lag= 6.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.1 fps, Min. Travel Time= 3.0 min
Avg. Velocity = 0.3 fps, Avg. Travel Time= 10.5 min

Peak Depth= 0.81'
Capacity at bank full= 43.53 cfs
Inlet Invert= 30.00', Outlet Invert= 29.50'
7.00' x 2.00' deep channel, n= 0.050 Length= 200.0' Slope= 0.0025 '/'
Side Slope Z-value= 3.0 2.0 '/'



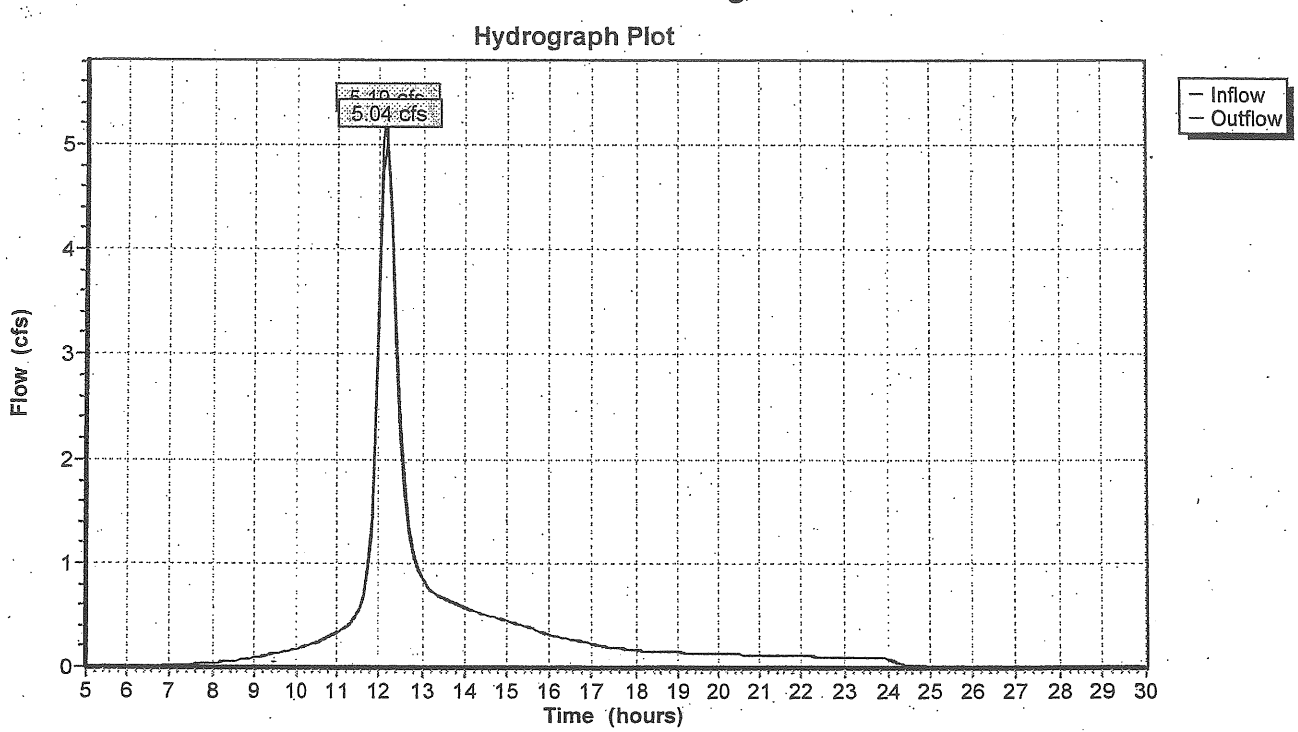
Reach 2R: Existing Swale

Inflow	=	5.19 cfs @ 12.15 hrs, Volume=	0.565 af	
Outflow	=	5.04 cfs @ 12.18 hrs, Volume=	0.565 af,	Atten= 3%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.7 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 0.5 fps, Avg. Travel Time= 2.7 min

Peak Depth= 0.51'
Capacity at bank full= 144.69 cfs
Inlet Invert= 30.80', Outlet Invert= 30.00'
5.00' x 3.00' deep channel, n= 0.050 Length= 80.0' Slope= 0.0100 '/'
Side Slope Z-value= 2.0 '/'

Reach 2R: Existing Swale

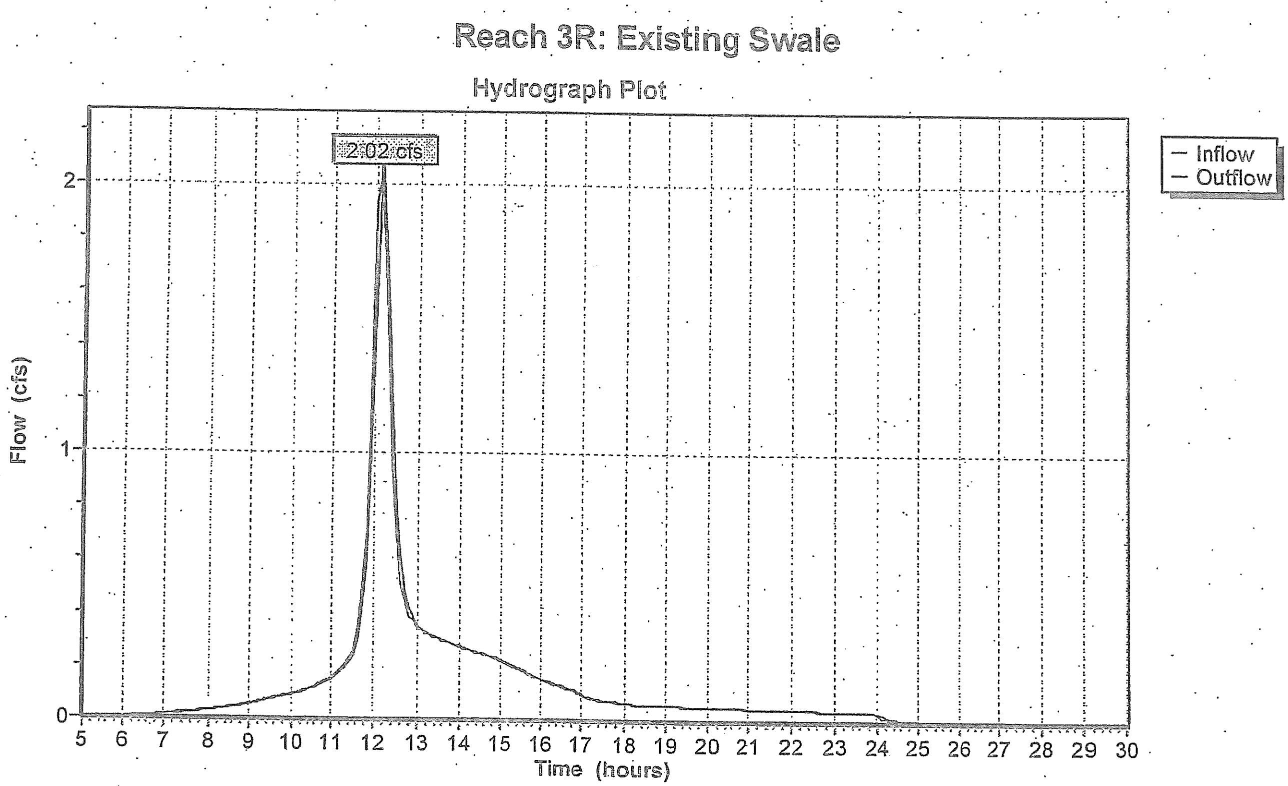


Reach 3R: Existing Swale

Inflow	=	2.03 cfs @ 12.07 hrs,	Volume=	0.242 af
Outflow	=	2.02 cfs @ 12.13 hrs,	Volume=	0.242 af, Atten= 0%, Lag= 3.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.2 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 0.4 fps, Avg. Travel Time= 5.4 min

Peak Depth= 0.30'
Capacity at bank full= 63.42 cfs
Inlet Invert= 32.00', Outlet Invert= 30.80'
5.00' x 2.00' deep channel, n= 0.050 Length= 120.0' Slope= 0.0100 '/'
Side Slope Z-value= 2.0 '/'



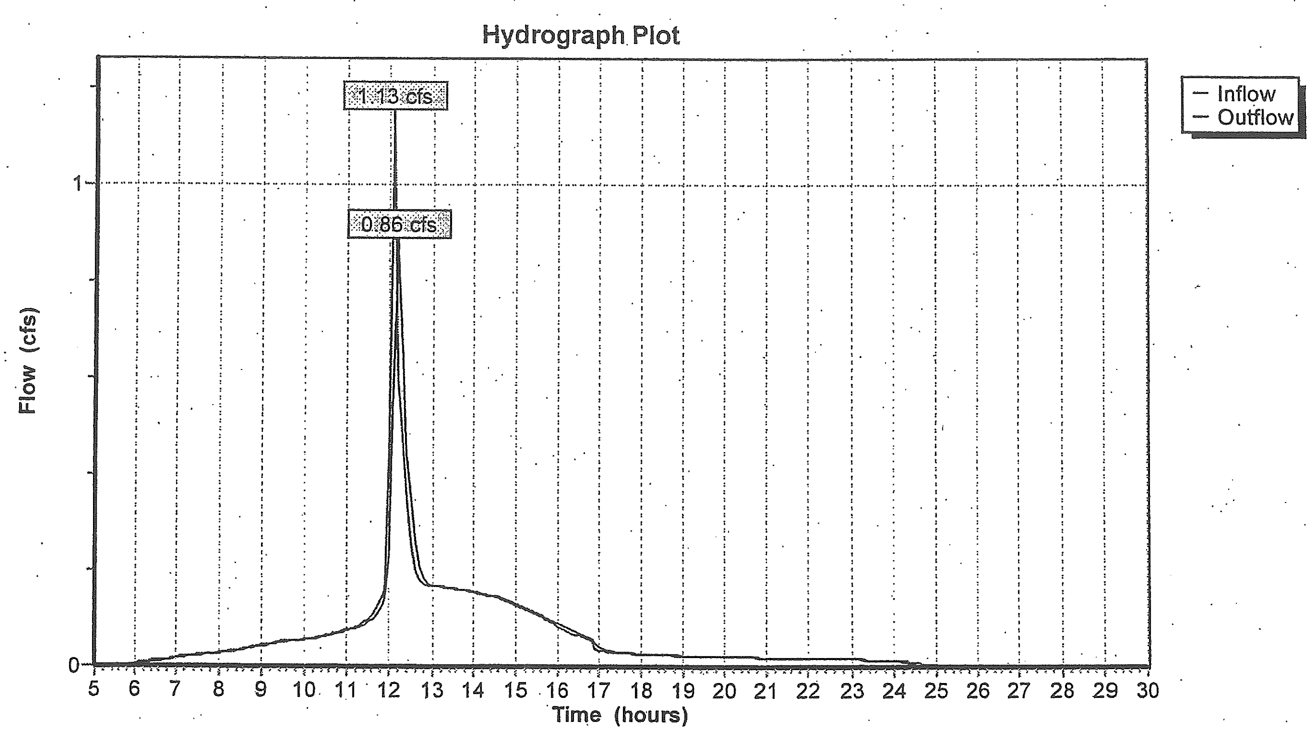
Reach R11: From P11 to Swale

Inflow	=	1.13 cfs @	12.11 hrs,	Volume=	0.108 af
Outflow	=	0.86 cfs @	12.21 hrs,	Volume=	0.108 af, Atten= 23%, Lag= 6.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.4 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 9.4 min

Peak Depth= 0.14'
Capacity at bank full= 33.01 cfs
Inlet Invert= 45.90', Outlet Invert= 32.00'
15.00' x 1.00' deep channel, n= 0.400 Length= 70.0' Slope= 0.1986 '/'
Side Slope Z-value= 10.0 '/'

Reach R11: From P11 to Swale



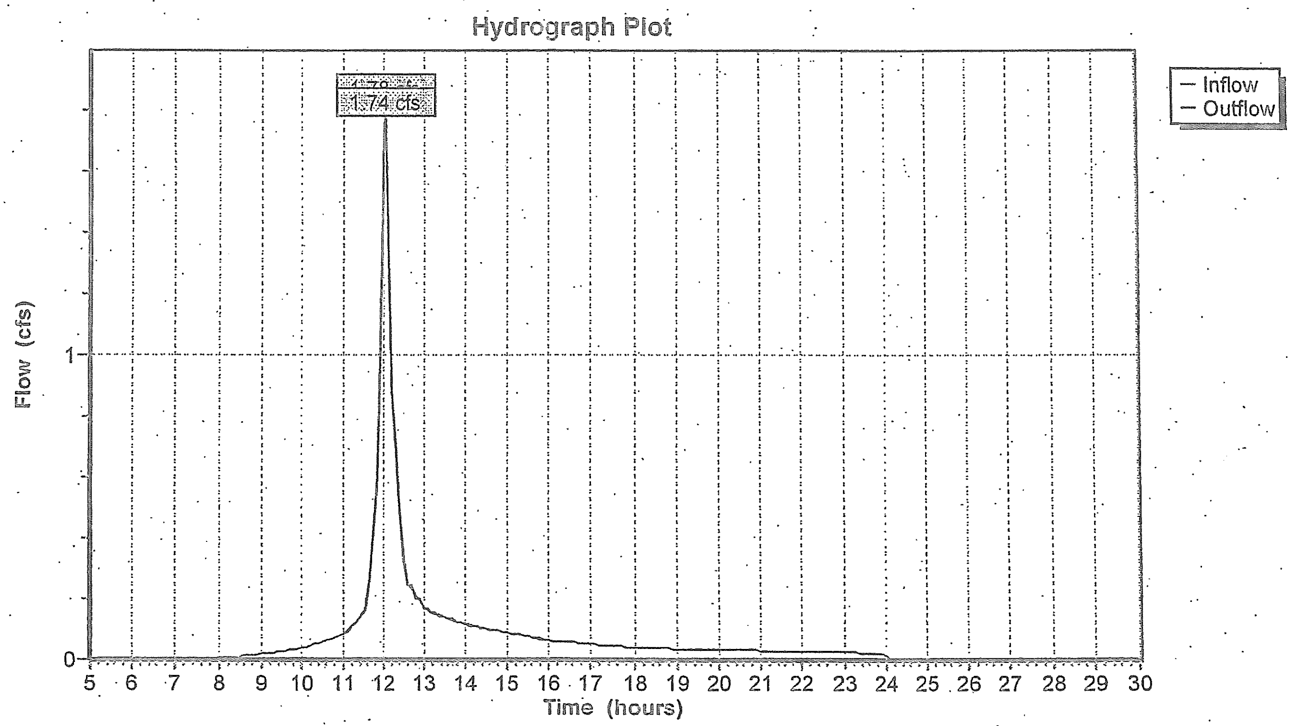
Reach R12: 48" RCP

Inflow = 1.78 cfs @ 12.02 hrs, Volume= 0.134 af
Outflow = 1.74 cfs @ 12.02 hrs, Volume= 0.134 af, Atten= 2%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 8.8 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.7 fps, Avg. Travel Time= 0.4 min

Peak Depth= 0.18'
Capacity at bank full= 463.95 cfs
Inlet Invert= 40.00', Outlet Invert= 32.00'
48.0" Diameter Pipe n= 0.012 Length= 90.0' Slope= 0.0889 '/'

Reach R12: 48" RCP



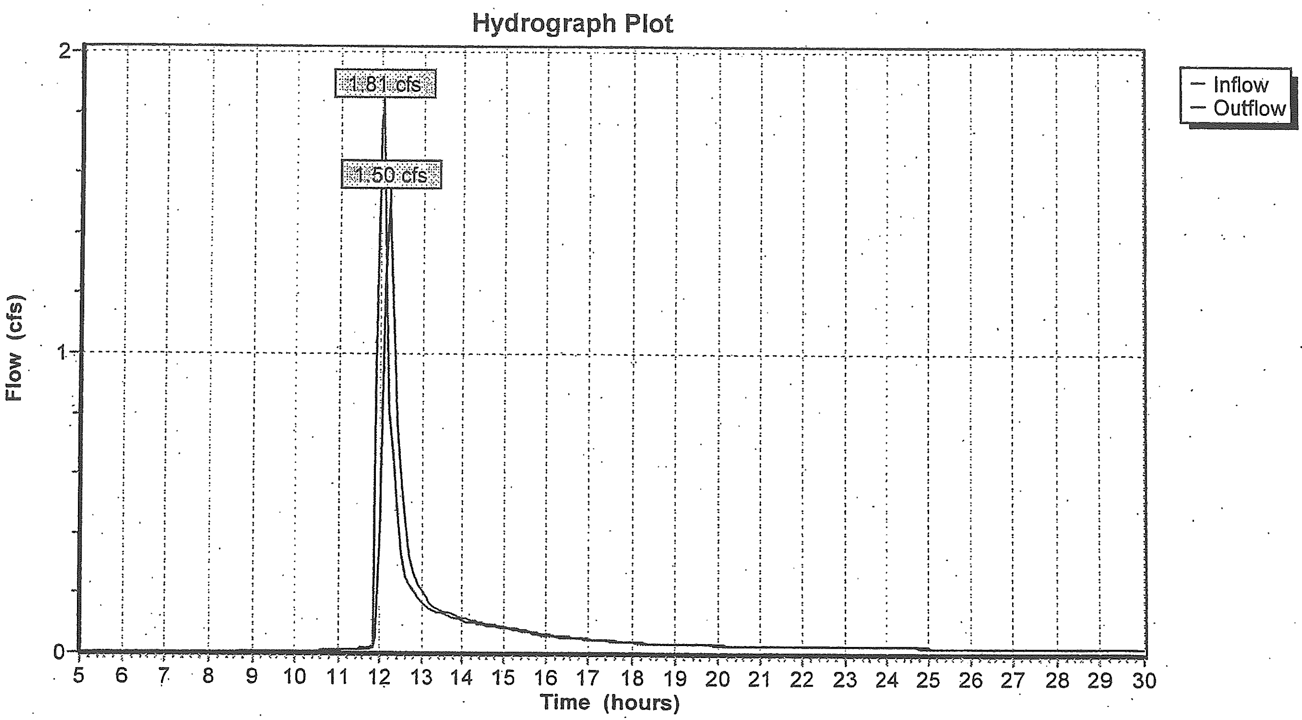
Reach R15: From P15 to Swale

Inflow	=	1.81 cfs @ 12.02 hrs, Volume=	0.121 af	
Outflow	=	1.50 cfs @ 12.19 hrs, Volume=	0.120 af,	Atten= 17%, Lag= 10.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.3 fps, Min. Travel Time= 5.1 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 19.5 min

Peak Depth= 0.36'
Capacity at bank full= 45.62 cfs
Inlet Invert= 34.00', Outlet Invert= 30.00'
10.00' x 2.00' deep channel, n= 0.400 Length= 100.0' Slope= 0.0400 '/'
Side Slope Z-value= 2.0 15.0 '/'

Reach R15: From P15 to Swale



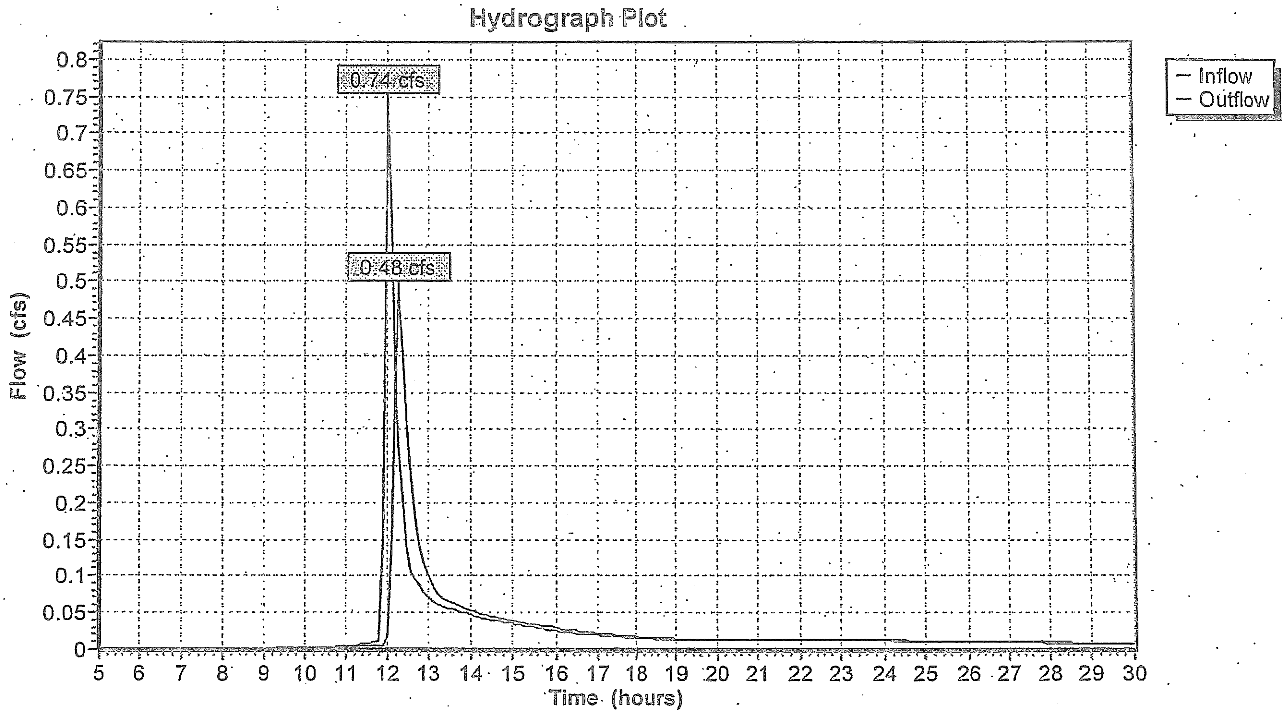
Reach R16: From P16 to Swale

Inflow = 0.74 cfs @ 12.03 hrs, Volume= 0.050 af
Outflow = 0.48 cfs @ 12.30 hrs, Volume= 0.049 af, Atten= 34%, Lag= 16.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.2 fps, Min. Travel Time= 8.4 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 29.6 min

Peak Depth= 0.10'
Capacity at bank full= 28.43 cfs
Inlet Invert= 41.00', Outlet Invert= 29.50'
20.00' x 1.00' deep channel, n= 0.400 Length= 120.0' Slope= 0.0958 '/'
Side Slope Z-value= 10.0 '/'

Reach R16: From P16 to Swale



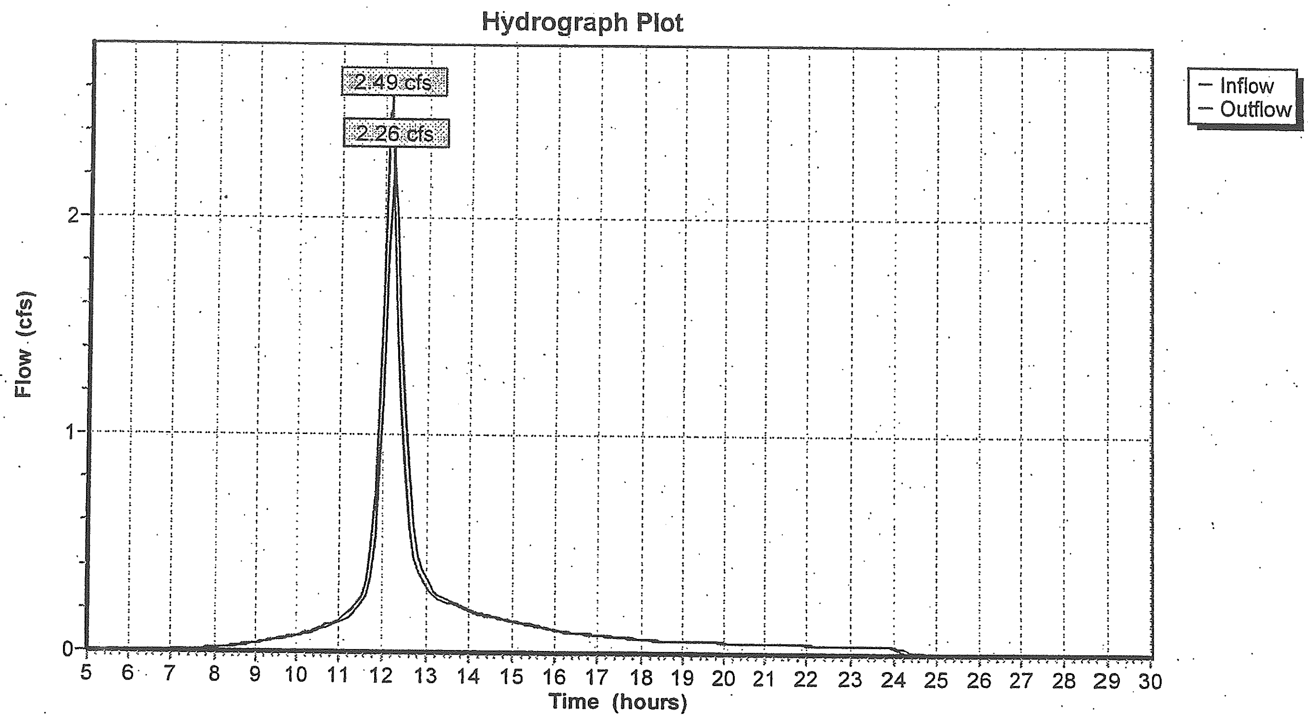
Reach R22: From 22 to Swale

Inflow	=	2.49 cfs @ 12.12 hrs, Volume=	0.222 af	
Outflow	=	2.26 cfs @ 12.21 hrs, Volume=	0.222 af,	Atten= 9%, Lag= 5.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.5 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 10.3 min

Peak Depth= 0.26'
Capacity at bank full= 27.37 cfs
Inlet Invert= 44.00', Outlet Invert= 30.50'
15.00' x 1.00' deep channel, n= 0.400 Length= 90.0' Slope= 0.1500 '/'
Side Slope Z-value= 15.0 2.0 '/'

Reach R22: From 22 to Swale



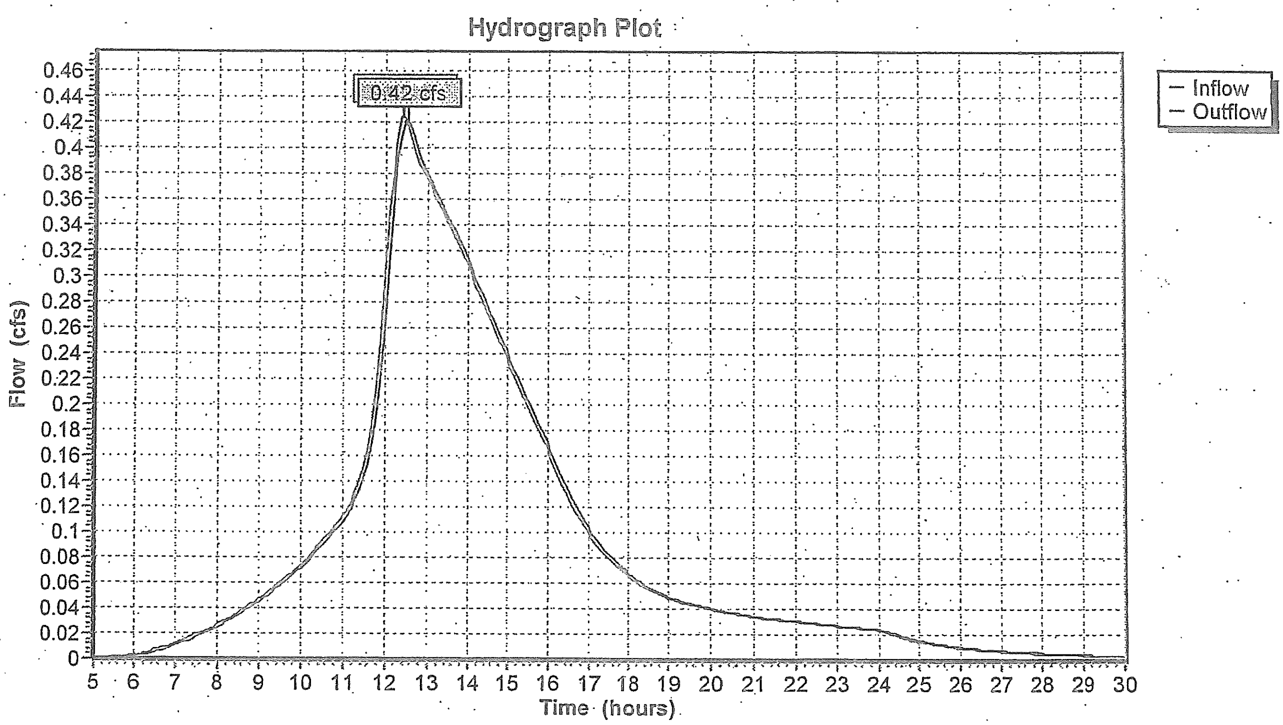
Reach R23: From 25 to Swale

Inflow	=	0.42 cfs @	12.46 hrs, Volume=	0.172 af
Outflow	=	0.42 cfs @	12.53 hrs, Volume=	0.172 af, Atten= 1%, Lag= 4.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.3 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 0.2 fps, Avg. Travel Time= 5.4 min

Peak Depth= 0.11'
Capacity at bank full= 28.77 cfs
Inlet Invert= 39.00', Outlet Invert= 30.00'
10.00' x 1.00' deep channel, n= 0.400 Length= 50.0' Slope= 0.1800 '/'
Side Slope Z-value= 15.0 '/'

Reach R23: From 25 to Swale



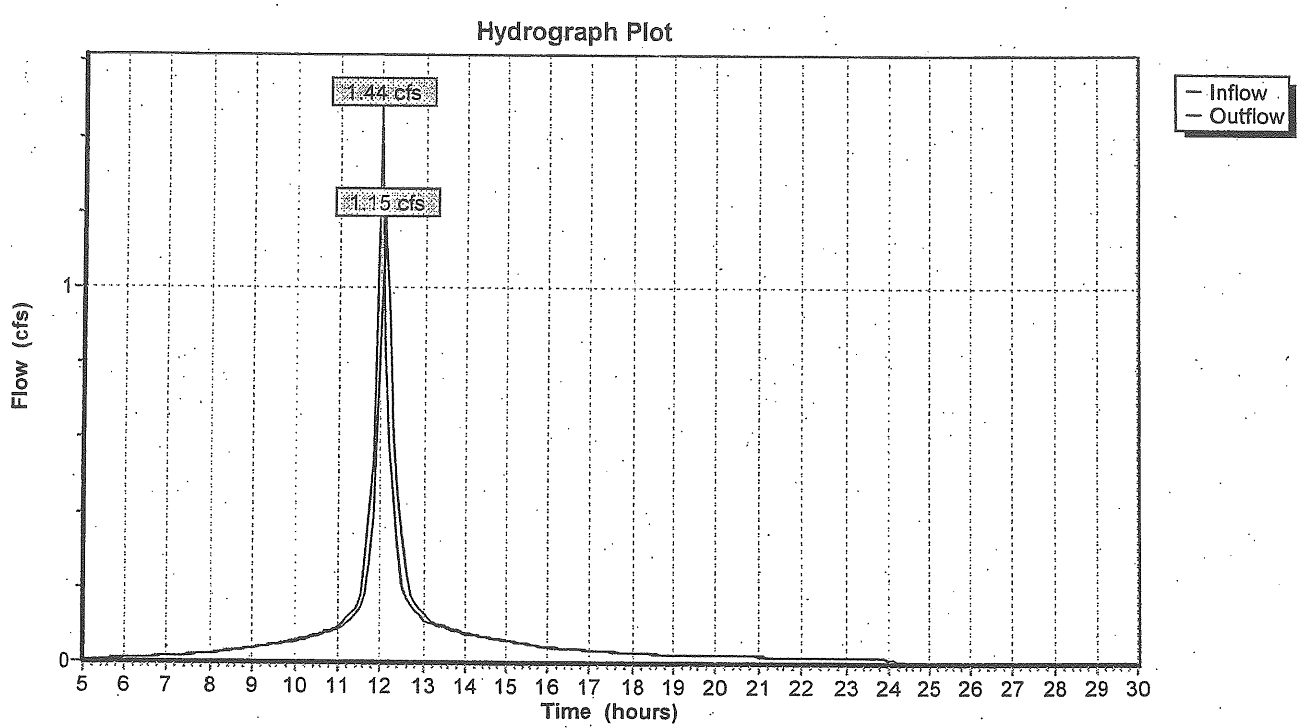
Reach R25: 24 to Dry Swale

Inflow = 1.44 cfs @ 12.00 hrs, Volume= 0.107 af
Outflow = 1.15 cfs @ 12.11 hrs, Volume= 0.107 af, Atten= 20%, Lag= 6.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.5 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 0.2 fps, Avg. Travel Time= 10.9 min

Peak Depth= 0.64'
Capacity at bank full= 7.62 cfs
Inlet Invert= 39.50', Outlet Invert= 34.00'
2.00' x 1.50' deep channel, n= 0.400 Length= 100.0' Slope= 0.0550 '/'
Side Slope Z-value= 3.0 '/'

Reach R25: 24 to Dry Swale



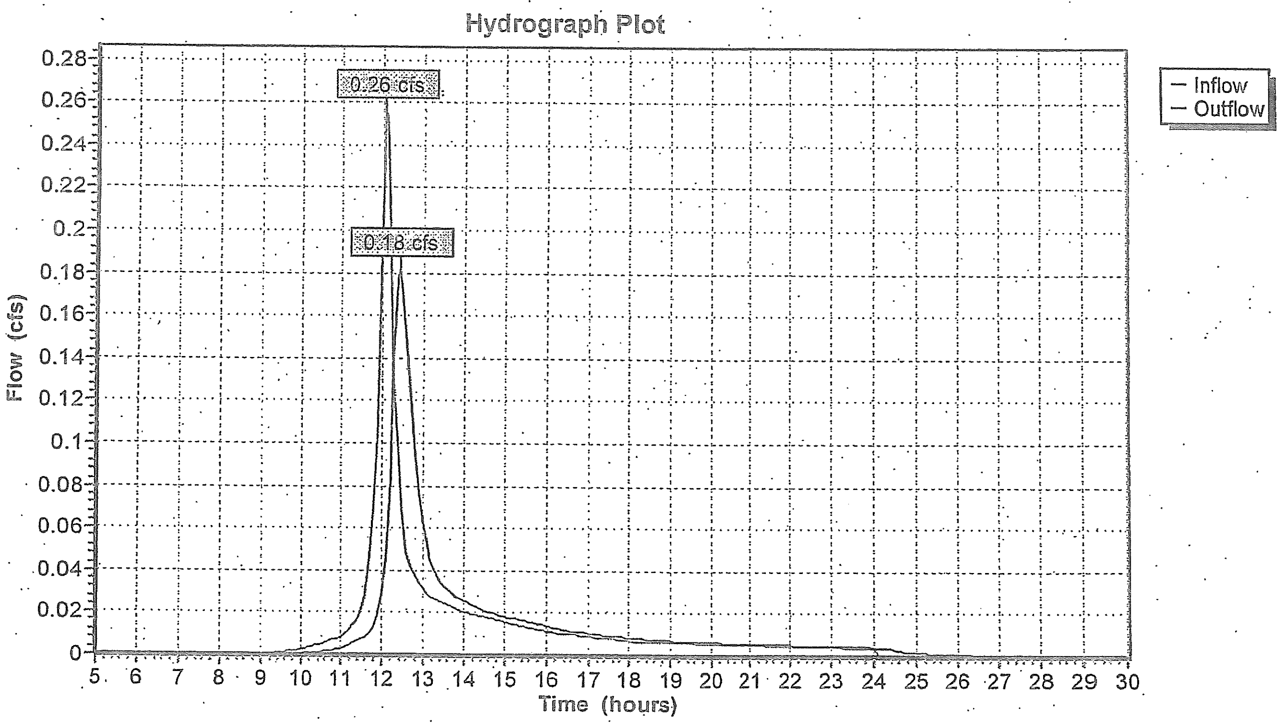
Reach R26: From 26 to SP

Inflow	=	0.26 cfs @	12.08 hrs,	Volume=	0.021 af
Outflow	=	0.18 cfs @	12.43 hrs,	Volume=	0.021 af, Atten= 29%, Lag= 21.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.2 fps, Min. Travel Time= 13.4 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 41.9 min

Peak Depth= 0.24'
Capacity at bank full= 10.11 cfs
Inlet Invert= 35.00', Outlet Invert= 29.50'
3.00' x 2.00' deep channel, n= 0.400 Length= 180.0' Slope= 0.0306 '/'
Side Slope Z-value= 2.0 '/'

Reach R26: From 26 to SP



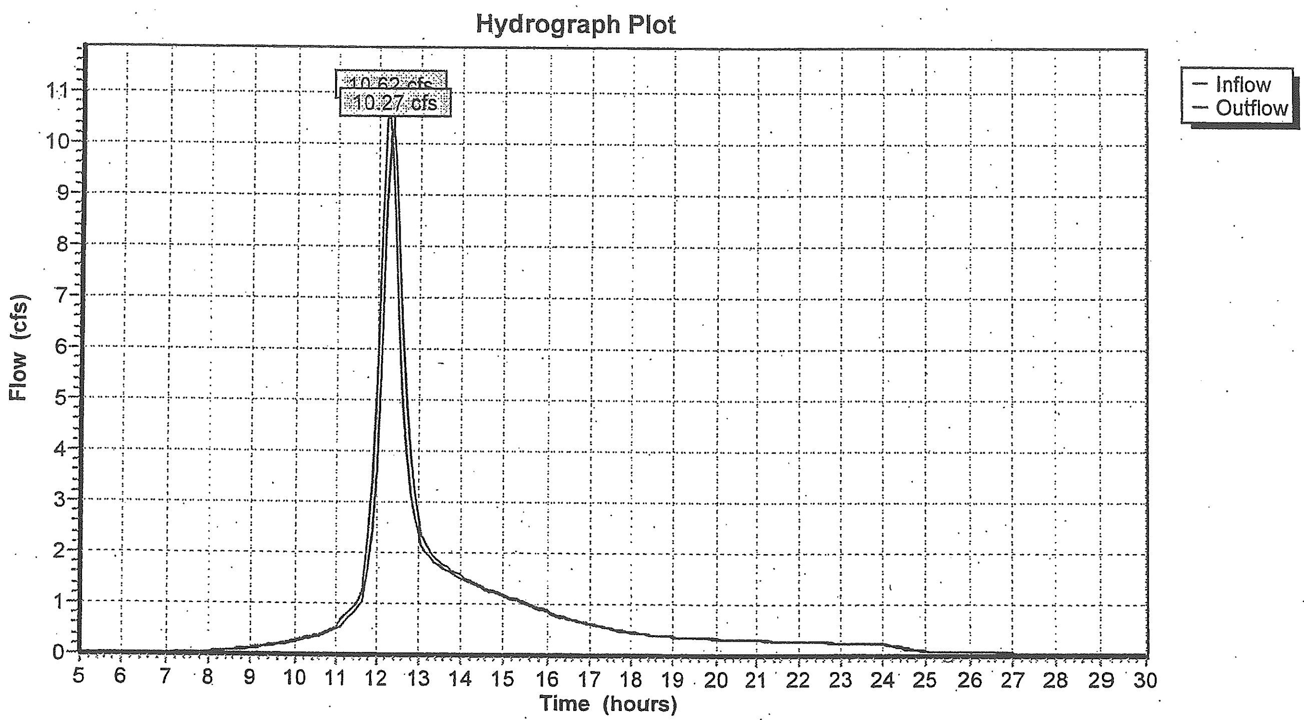
Reach SP: Study Point

Inflow	=	10.62 cfs @ 12.24 hrs, Volume=	1.337 af	
Outflow	=	10.27 cfs @ 12.33 hrs, Volume=	1.336 af,	Atten= 3%, Lag= 5.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.6 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.2 fps, Avg. Travel Time= 10.5 min

Peak Depth= 0.50'
Capacity at bank full= 239.77 cfs
Inlet Invert= 29.50', Outlet Invert= 29.40'
35.00' x 3.00' deep channel, n= 0.050 Length= 100.0' Slope= 0.0010 '/'
Side Slope Z-value= 5.0 4.0 '/'

Reach SP: Study Point



Pond P11: Existing Satellite Lot Detention Pond

Inflow	=	1.44 cfs @	11.99 hrs,	Volume=	0.109 af
Outflow	=	1.13 cfs @	12.11 hrs,	Volume=	0.108 af, Atten= 22%, Lag= 6.9 min
Primary	=	0.18 cfs @	12.11 hrs,	Volume=	0.090 af
Secondary	=	0.95 cfs @	12.11 hrs,	Volume=	0.019 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 48.70' Storage= 1,141 cf
Plug-Flow detention time= 47.6 min calculated for 0.108 af (99% of inflow)
Storage and wetted areas determined by Prismatic sections

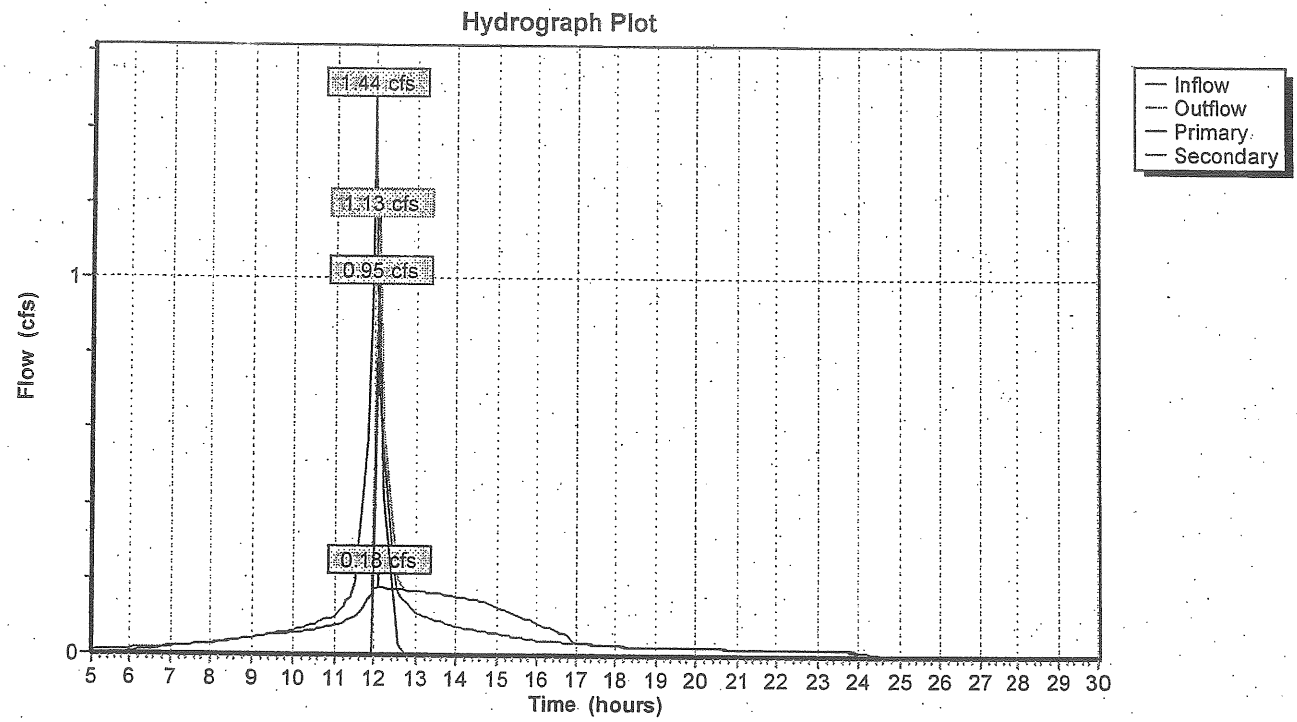
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.00	10	0	0
47.00	117	64	64
48.00	674	396	459
49.00	1,276	975	1,434

Primary OutFlow (Free Discharge)
├─1=Orifice/Grate
└─2=Orifice/Grate

Secondary OutFlow (Free Discharge)
└─3=Sharp-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	46.50'	**1.0" Vert. Orifice/Grate** C= 0.600
2	Primary	46.80'	**2.0" Vert. Orifice/Grate** C= 0.600
3	Secondary	48.50'	**3.1' long x 0.5' high Sharp-Crested Rectangular Weir** 0 End Contraction(s)

Pond P11: Existing Satellite Lot Detention Pond



Pond P15: Pond 15

Inflow	=	1.99 cfs @	11.99 hrs,	Volume=	0.147 af
Outflow	=	1.81 cfs @	12.02 hrs,	Volume=	0.121 af, Atten= 9%, Lag= 2.0 min
Primary	=	0.03 cfs @	12.02 hrs,	Volume=	0.038 af
Secondary	=	1.78 cfs @	12.02 hrs,	Volume=	0.084 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 40.71' Storage= 1,948 cf
Plug-Flow detention time= 191.5 min calculated for 0.121 af (82% of inflow)
Storage and wetted areas determined by Prismatic sections

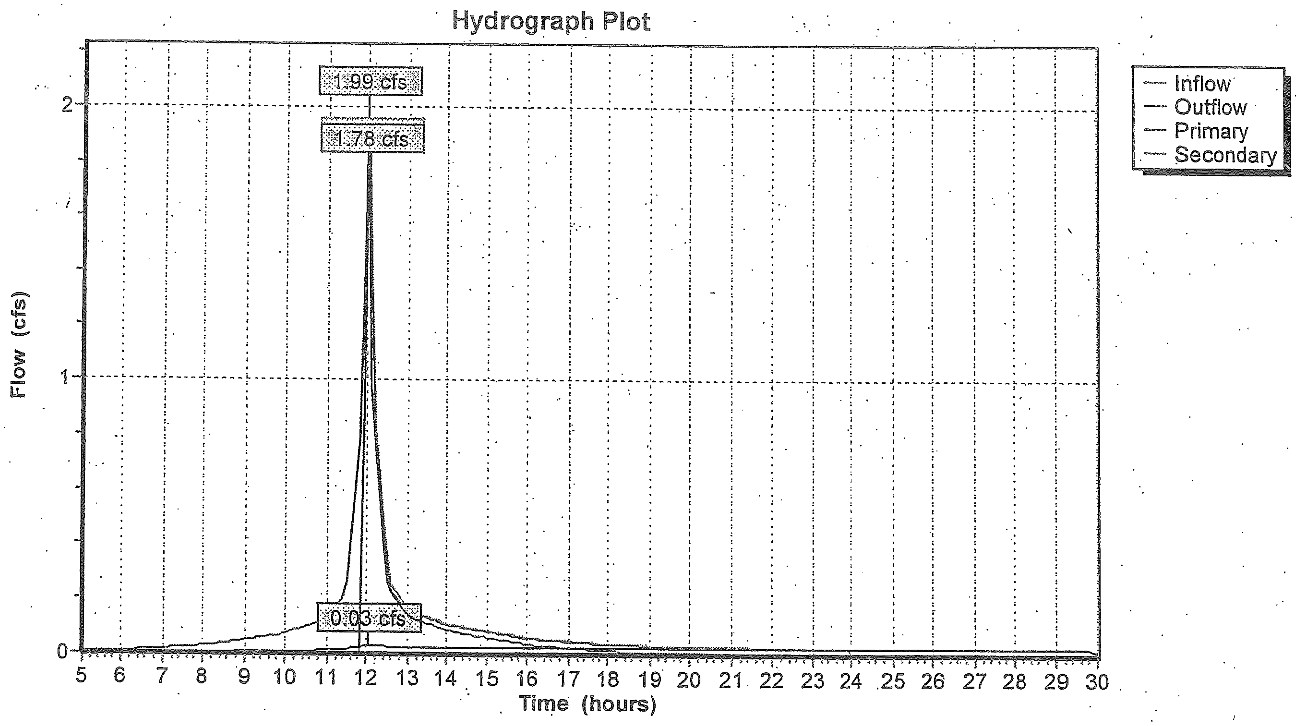
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.00	724	0	0
40.00	1,189	957	957
40.50	1,443	658	1,615
41.00	1,711	789	2,403
42.00	2,290	2,001	4,404

Primary OutFlow (Free Discharge)
└─2=Culvert
  └─1=Exfiltration

Secondary OutFlow (Free Discharge)
└─3=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Device 2	39.00'	**0.002000 fpm Exfiltration over Surface area above invert**
2	Primary	36.50'	**6.0" x 80.0' long Culvert** RCP, groove end projecting, Ke= 0.200 Outlet Invert= 35.00' S= 0.0187 '/' n= 0.011 Cc= 0.900
3	Secondary	40.50'	**7.0' long x 13.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.62 2.66 2.70 2.66 2.65 2.66 2.65 2.63

Pond P15: Pond 15



Pond P16: Pond 16

Inflow = 0.80 cfs @ 11.99 hrs, Volume= 0.057 af
Outflow = 0.74 cfs @ 12.03 hrs, Volume= 0.050 af, Atten= 8%, Lag= 2.5 min
Primary = 0.02 cfs @ 12.03 hrs, Volume= 0.019 af
Secondary = 0.72 cfs @ 12.03 hrs, Volume= 0.031 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 45.71' Storage= 697 cf
Plug-Flow detention time= 184.7 min calculated for 0.049 af (87% of inflow)
Storage and wetted areas determined by Prismatic sections

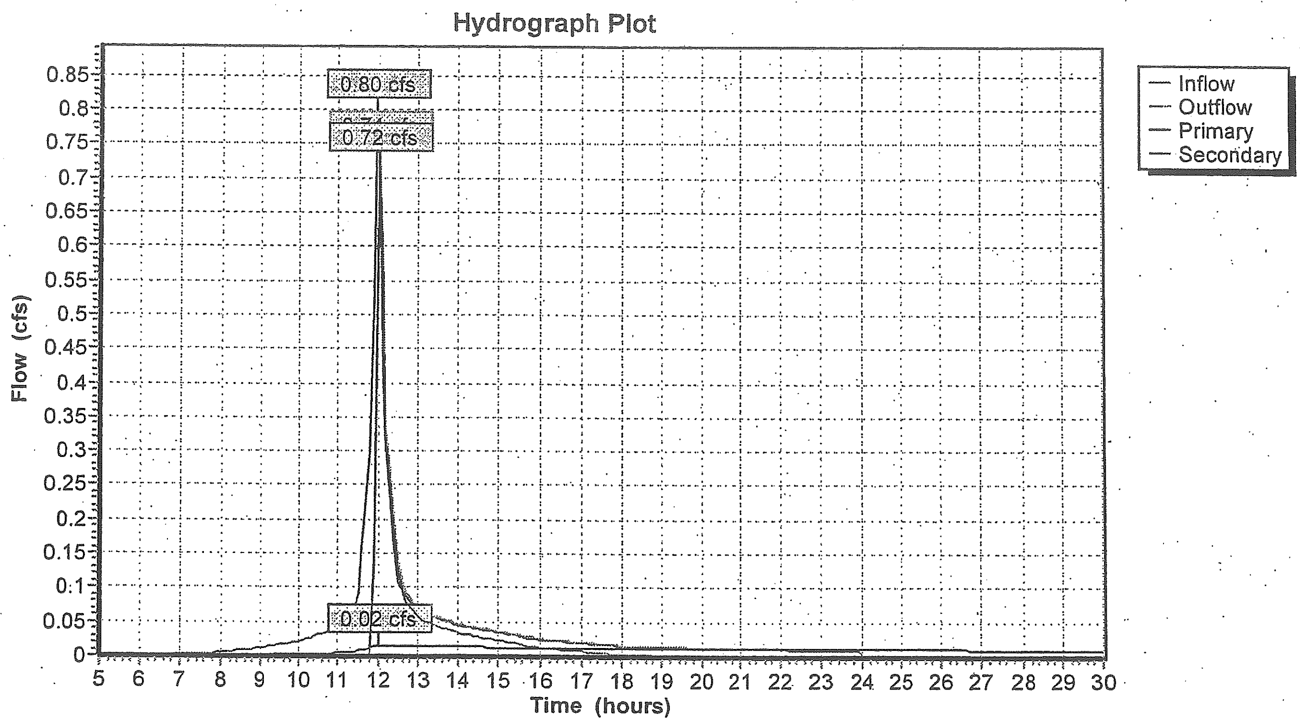
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.00	190	0	0
45.00	430	310	310
45.50	573	251	561
46.00	751	331	892
47.00	1,145	948	1,840

Primary OutFlow (Free Discharge)
└─2=Culvert
  └─1=Exfiltration

Secondary OutFlow (Free Discharge)
└─3=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Device 2	44.00'	**0.002000 fpm Exfiltration over Surface area above invert**
2	Primary	41.50'	**6.0" x 50.0' long Culvert** RCP, groove end projecting, Ke= 0.200 Outlet Invert= 41.00' S= 0.0100 '/' n= 0.011 Cc= 0.900
3	Secondary	45.50'	**3.0' long x 13.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.62 2.66 2.70 2.66 2.65 2.66 2.65 2.63

Pond P16: Pond 16



Pond P23: Pond 23

Inflow	=	2.08 cfs @	12.02 hrs, Volume=	0.174 af	
Outflow	=	0.42 cfs @	12.46 hrs, Volume=	0.172 af,	Atten= 80%, Lag= 26.5 min
Primary	=	0.40 cfs @	12.46 hrs, Volume=	0.171 af	
Secondary	=	0.02 cfs @	12.46 hrs, Volume=	0.001 af	

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 41.07' Storage= 3,028 cf
Plug-Flow detention time= 116.1 min calculated for 0.171 af (98% of inflow)
Storage and wetted areas determined by Prismatic sections

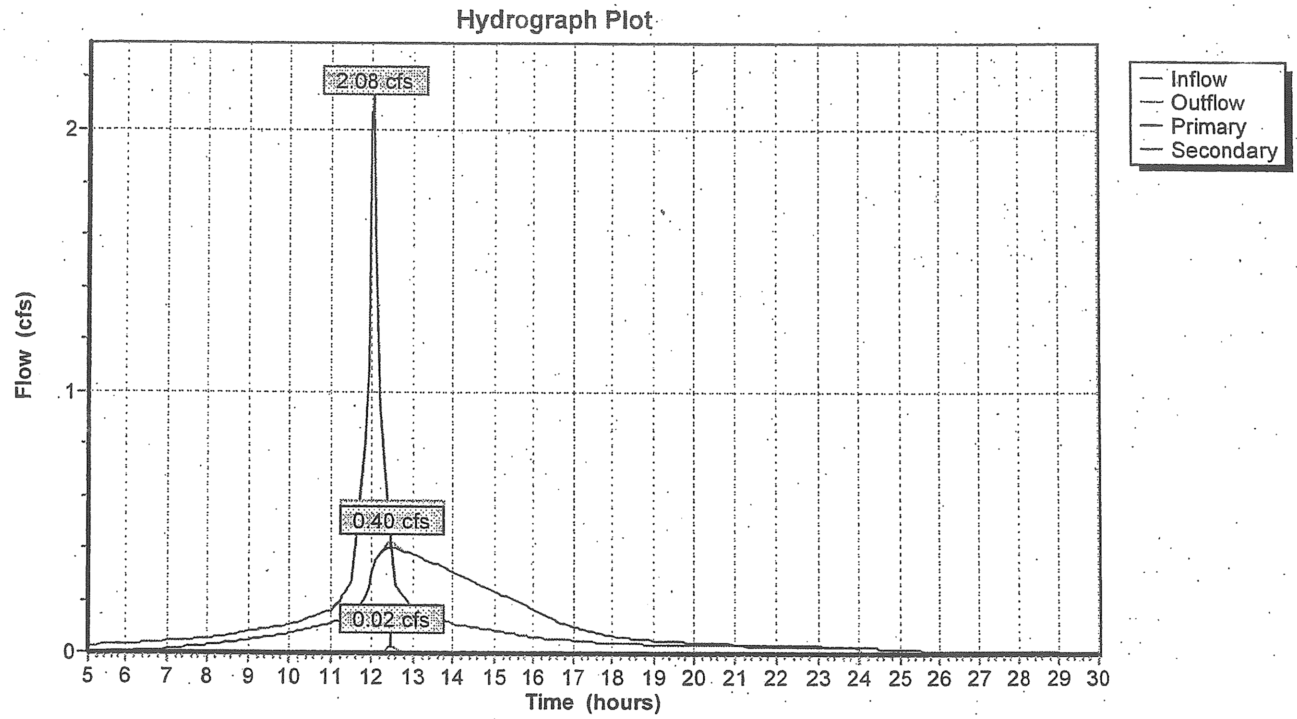
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
40.00	2,820	0	0
42.00	2,820	5,640	5,640

Primary OutFlow (Free Discharge)
└─1=Culvert

Secondary OutFlow (Free Discharge)
└─2=Culvert

#	Routing	Invert	Outlet Devices
1	Primary	40.00'	**4.0" x 10.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 39.50' S= 0.0500 '/' n= 0.011 Cc= 0.900
2	Secondary	41.00'	**12.0" x 10.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 39.50' S= 0.1500 '/' n= 0.011 Cc= 0.900

Pond P23: Pond 23



Pond P24: Dry Swale

Inflow =	2.05 cfs @ 12.04 hrs,	Volume=	0.188 af
Outflow =	2.00 cfs @ 12.08 hrs,	Volume=	0.175 af, Atten= 2%, Lag= 2.8 min
Primary =	0.02 cfs @ 12.08 hrs,	Volume=	0.031 af
Secondary =	1.98 cfs @ 12.08 hrs,	Volume=	0.144 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 35.74' Storage= 1,131 cf
Plug-Flow detention time= 102.1 min calculated for 0.175 af (93% of inflow)
Storage and wetted areas determined by Prismatic sections

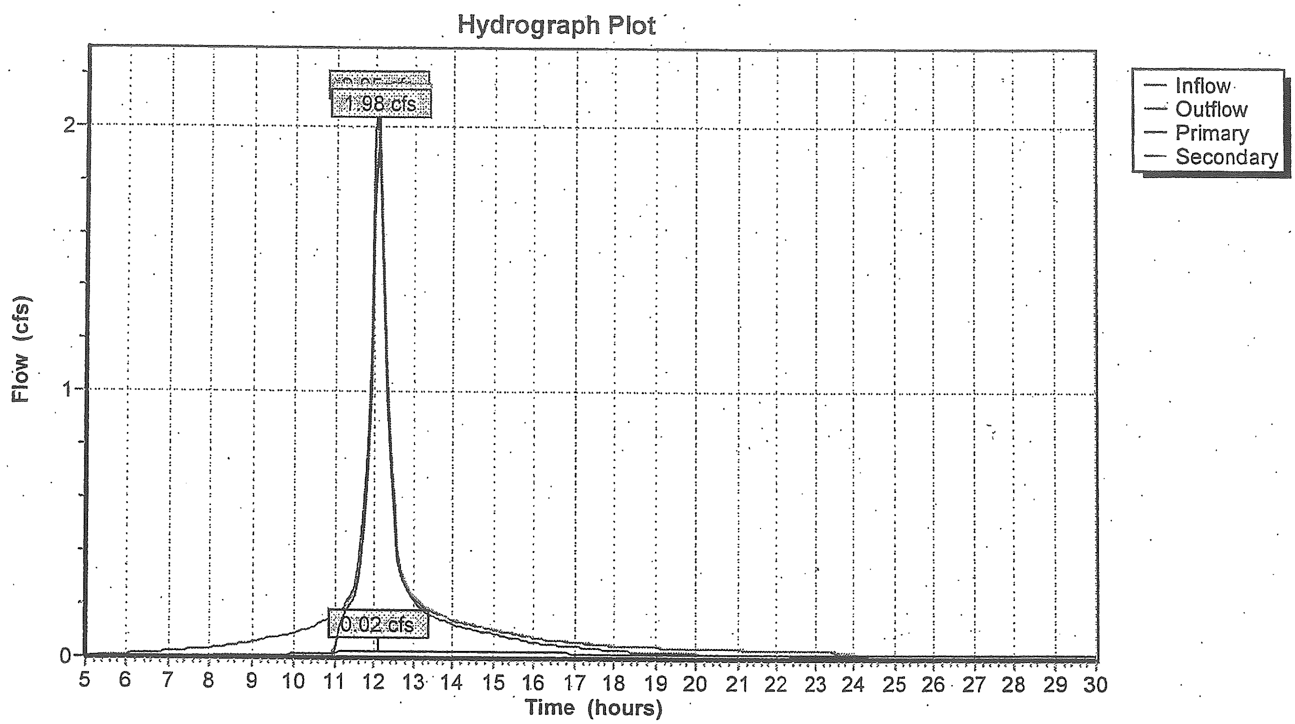
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.00	329	0	0
35.00	681	505	505
35.50	878	390	895
36.00	1,090	492	1,387

Primary OutFlow (Free Discharge)
└─2=Culvert
└─1=Exfiltration

Secondary OutFlow (Free Discharge)
└─3=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Device 2	34.00'	**0.002000 fpm Exfiltration over Surface area above invert**
2	Primary	32.50'	**6.0" x 50.0' long Culvert** CMP, projecting, no headwall, Ke= 0.900 Outlet Invert= 32.00' S= 0.0100 '/' n= 0.010 Cc= 0.900
3	Secondary	35.50'	**7.0' long x 6.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4 Coef. (English) 2.38 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.6

Pond P24: Dry Swale



Time span=5.00-30.00 hrs, dt=0.10 hrs, 251 points
Runoff by SCS TR-20 method, UH=SCS, Type III 24-hr Rainfall=5.50"
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 11S: Satellite Parking
Tc=2.1 min CN=95 Area=0.320 ac Runoff= 1.70 cfs 0.130 af

Subcatchment 12S: North/West of Satellite
Tc=4.8 min CN=81 Area=0.590 ac Runoff= 2.24 cfs 0.169 af

Subcatchment 13S: Proposed NORTH-CENTRAL
Tc=9.7 min CN=75 Area=0.670 ac Runoff= 1.90 cfs 0.160 af

Subcatchment 14S: Proposed Northeast
Tc=14.2 min CN=76 Area=0.590 ac Runoff= 1.50 cfs 0.145 af

Subcatchment 15S: Proposed Parking
Tc=1.4 min CN=91 Area=0.480 ac Runoff= 2.38 cfs 0.178 af

Subcatchment 16S: Proposed Parking
Tc=1.5 min CN=85 Area=0.220 ac Runoff= 0.98 cfs 0.070 af

Subcatchment 21S: Proposed Central
Tc=8.6 min CN=76 Area=0.530 ac Runoff= 1.57 cfs 0.130 af

Subcatchment 22S: Existing Parking and Entrance Circle
Tc=11.8 min CN=85 Area=0.860 ac Runoff= 3.07 cfs 0.275 af

Subcatchment 23S: Proposed Buildings
Tc=5.0 min CN=98 Area=0.480 ac Runoff= 2.44 cfs 0.205 af

Subcatchment 24S: Expanded Parking
Tc=3.8 min CN=89 Area=0.280 ac Runoff= 1.34 cfs 0.099 af

Subcatchment 25S: Access & Rear Parking
Tc=3.2 min CN=93 Area=0.330 ac Runoff= 1.71 cfs 0.128 af

Subcatchment 26S: Rear of Building
Tc=7.8 min CN=74 Area=0.120 ac Runoff= 0.33 cfs 0.028 af

Reach 1R: Existing Swale Inflow= 10.68 cfs 1.215 af
Length= 200.0' Max Vel= 1.2 fps Capacity= 43.53 cfs Outflow= 10.06 cfs 1.214 af

Reach 2R: Existing Swale Inflow= 6.85 cfs 0.703 af
Length= 80.0' Max Vel= 1.8 fps Capacity= 144.69 cfs Outflow= 6.59 cfs 0.703 af

Reach 3R: Existing Swale Inflow= 2.92 cfs 0.297 af
Length= 120.0' Max Vel= 1.4 fps Capacity= 63.42 cfs Outflow= 2.86 cfs 0.297 af

Reach R11: From P11 to Swale Inflow= 1.34 cfs 0.129 af
Length= 70.0' Max Vel= 0.5 fps Capacity= 33.01 cfs Outflow= 1.19 cfs 0.129 af

Reach R12: 48" RCP Inflow= 2.24 cfs 0.169 af
Length= 90.0' Max Vel= 9.4 fps Capacity= 463.95 cfs Outflow= 2.19 cfs 0.169 af

Reach R15: From P15 to Swale Inflow= 2.15 cfs 0.152 af
Length= 100.0' Max Vel= 0.3 fps Capacity= 45.62 cfs Outflow= 1.83 cfs 0.151 af

Reach R16: From P16 to Swale Inflow= 0.88 cfs 0.063 af
Length= 120.0' Max Vel= 0.3 fps Capacity= 28.43 cfs Outflow= 0.70 cfs 0.062 af

Reach R22: From 22 to Swale Inflow= 3.07 cfs 0.275 af
Length= 90.0' Max Vel= 0.6 fps Capacity= 27.37 cfs Outflow= 2.79 cfs 0.275 af

Reach R23: From 25 to Swale Inflow= 0.64 cfs 0.202 af
Length= 50.0' Max Vel= 0.4 fps Capacity= 28.77 cfs Outflow= 0.63 cfs 0.202 af

Reach R25: 24 to Dry Swale Inflow= 1.71 cfs 0.128 af
Length= 100.0' Max Vel= 0.5 fps Capacity= 7.62 cfs Outflow= 1.37 cfs 0.128 af

Reach R26: From 26 to SP Inflow= 0.33 cfs 0.028 af
Length= 180.0' Max Vel= 0.2 fps Capacity= 10.11 cfs Outflow= 0.25 cfs 0.028 af

Reach SP: Study Point Inflow= 13.94 cfs 1.664 af
Length= 100.0' Max Vel= 0.6 fps Capacity= 239.77 cfs Outflow= 13.43 cfs 1.662 af

Pond P11: Existing Satellite Lot Detention Pond Peak Storage= 1,169 cf Inflow= 1.70 cfs 0.130 af
Primary= 0.18 cfs 0.100 af Secondary= 1.16 cfs 0.029 af Outflow= 1.34 cfs 0.129 af

Pond P15: Pond 15 Peak Storage= 1,988 cf Inflow= 2.38 cfs 0.178 af
Primary= 0.03 cfs 0.039 af Secondary= 2.12 cfs 0.113 af Outflow= 2.15 cfs 0.152 af

Pond P16: Pond 16 Peak Storage= 712 cf Inflow= 0.98 cfs 0.070 af
Primary= 0.02 cfs 0.020 af Secondary= 0.86 cfs 0.043 af Outflow= 0.88 cfs 0.063 af

Pond P23: Pond 23 Peak Storage= 3,441 cf Inflow= 2.44 cfs 0.205 af
Primary= 0.43 cfs 0.194 af Secondary= 0.20 cfs 0.008 af Outflow= 0.64 cfs 0.202 af

Pond P24: Dry Swale Peak Storage= 1,161 cf Inflow= 2.48 cfs 0.227 af
Primary= 0.02 cfs 0.032 af Secondary= 2.39 cfs 0.183 af Outflow= 2.41 cfs 0.214 af

Runoff Area = 5.470 ac Volume = 1.716 af Average Depth = 3.77"

Subcatchment 11S: Satellite Parking

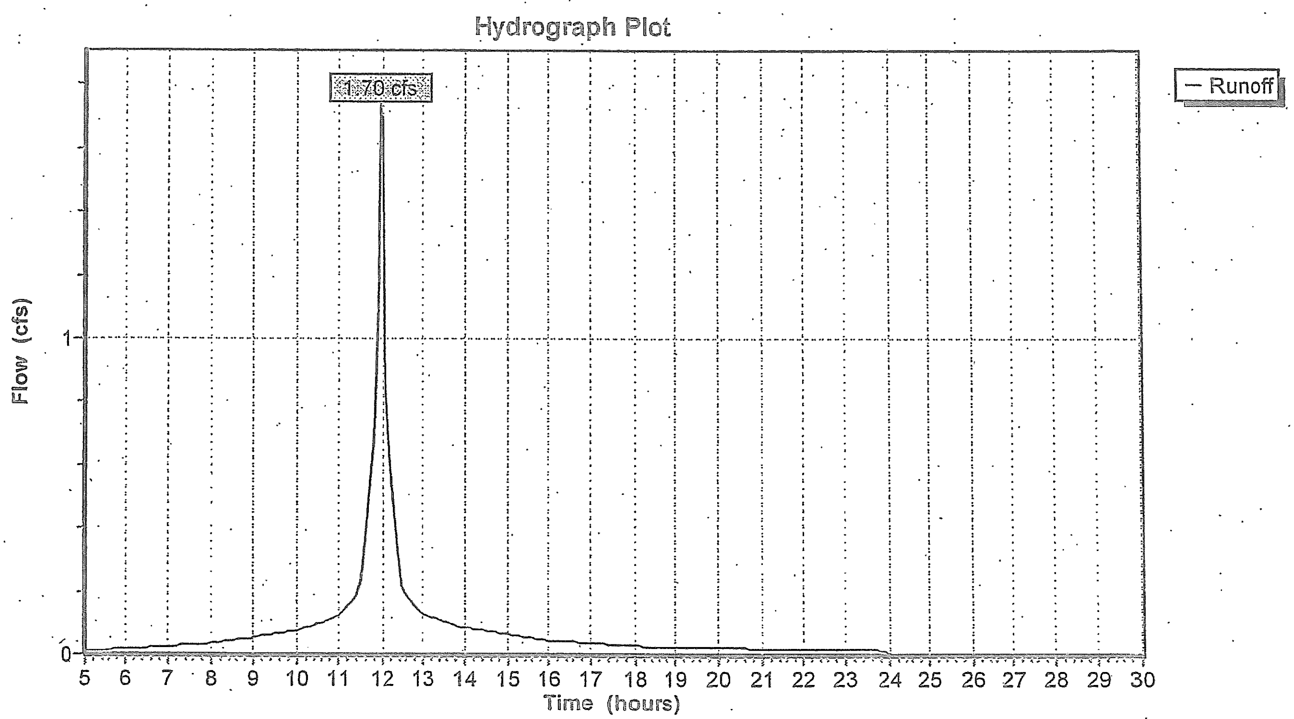
Runoff = 1.70 cfs @ 11.99 hrs, Volume= 0.130 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.270	98	IMPERVIOUS (PARKING LOT)
0.040	74	OPEN SPACE (GOOD)-HSG "C"
0.010	89	RIP RAP-HSG "C"
0.320	95	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0303	1.6		**Sheet Flow, Segment ID:AB** Smooth surfaces n= 0.011 P2= 3.00"
0.1	15	0.3300	4.0		**Shallow Concentrated Flow, Segment ID:BC** Kv= 7.0 fps
0.9	55	0.0200	1.0		**Shallow Concentrated Flow, Segment ID:CD** Short Grass Pasture Kv= 7.0 fps
2.1	170	Total			

Subcatchment 11S: Satellite Parking



Subcatchment 12S: North/West of Satellite

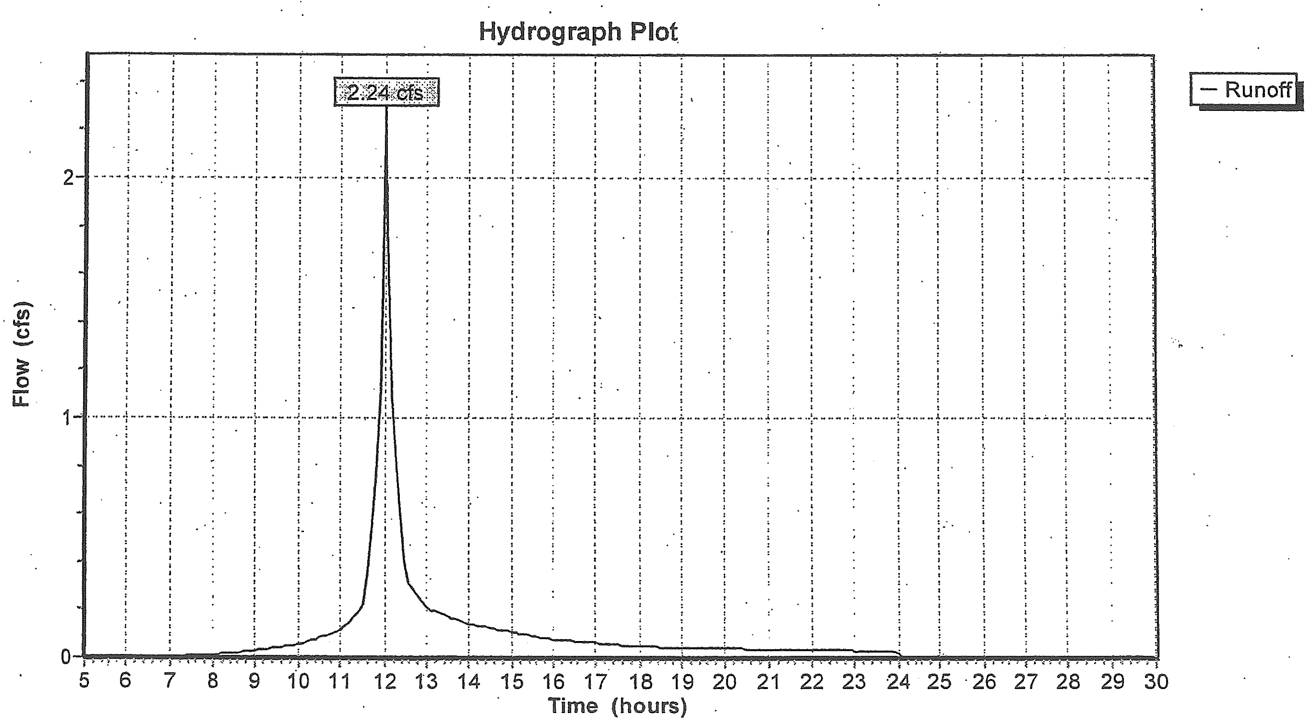
Runoff = 2.24 cfs @ 12.02 hrs, Volume= 0.169 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.020	73	WOODS (FAIR)-HSG "C"
0.400	74	OPEN SPACE (GOOD)-HSG "C"
0.170	98	IMPERVIOUS
0.590	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	16	0.1900	0.2		**Sheet Flow, Segment ID:AB** Grass: Dense n= 0.240 P2= 3.00"
0.8	13	0.5000	0.3		**Sheet Flow, Segment ID:BC** Grass: Dense n= 0.240 P2= 3.00"
1.3	185	0.0270	2.5		**Shallow Concentrated Flow, Segment ID:CD** Grassed Waterway Kv= 15.0 fps
0.2	60	0.0100	5.7	7.00	**Circular Channel (pipe), SEGMENT ID:DE** Diam= 15.0" Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
1.1	165	0.0300	2.6		**Shallow Concentrated Flow, SEGMENT ID:EF** Grassed Waterway Kv= 15.0 fps
4.8	439	Total			

Subcatchment 12S: North/West of Satellite



Subcatchment 13S: Proposed NORTH-CENTRAL

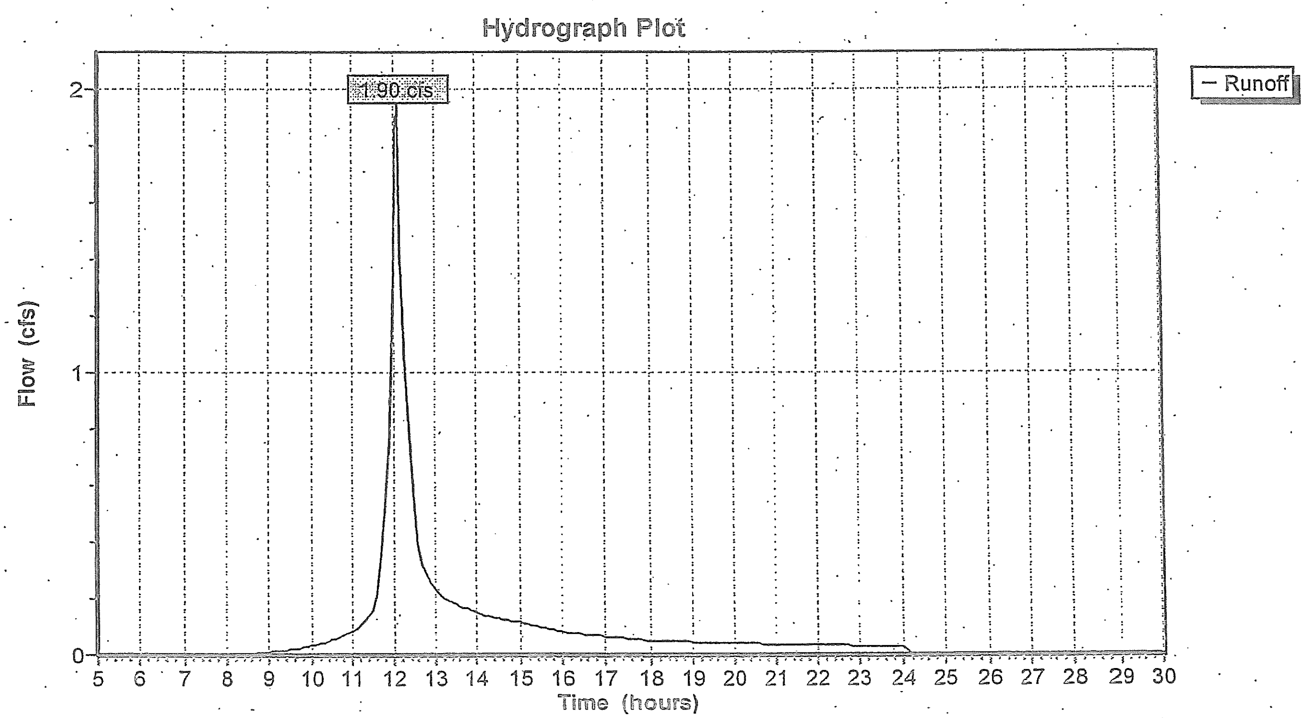
Runoff = 1.90 cfs @ 12.10 hrs, Volume= 0.160 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.300	73	WOODS (FAIR)-HSG "C"
0.130	74	OPEN SPACE (GOOD)-HSG "C"
0.240	79	WOODS (FAIR)-HSG "D"
0.670	75	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	5	0.5000	0.3		**Sheet Flow, Segment ID:AB** Grass: Short n= 0.150 P2= 3.00"
7.2	65	0.1400	0.2		**Sheet Flow, Segment ID:BC** Woods: Light underbrush n= 0.400 P2= 3.00"
0.5	45	0.1000	1.6		**Shallow Concentrated Flow, SegmentC-D** Woodland Kv= 5.0 fps
1.7	100	0.0400	1.0		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
9.7	215	Total			

Subcatchment 13S: Proposed NORTH-CENTRAL



Subcatchment 14S: Proposed Northeast

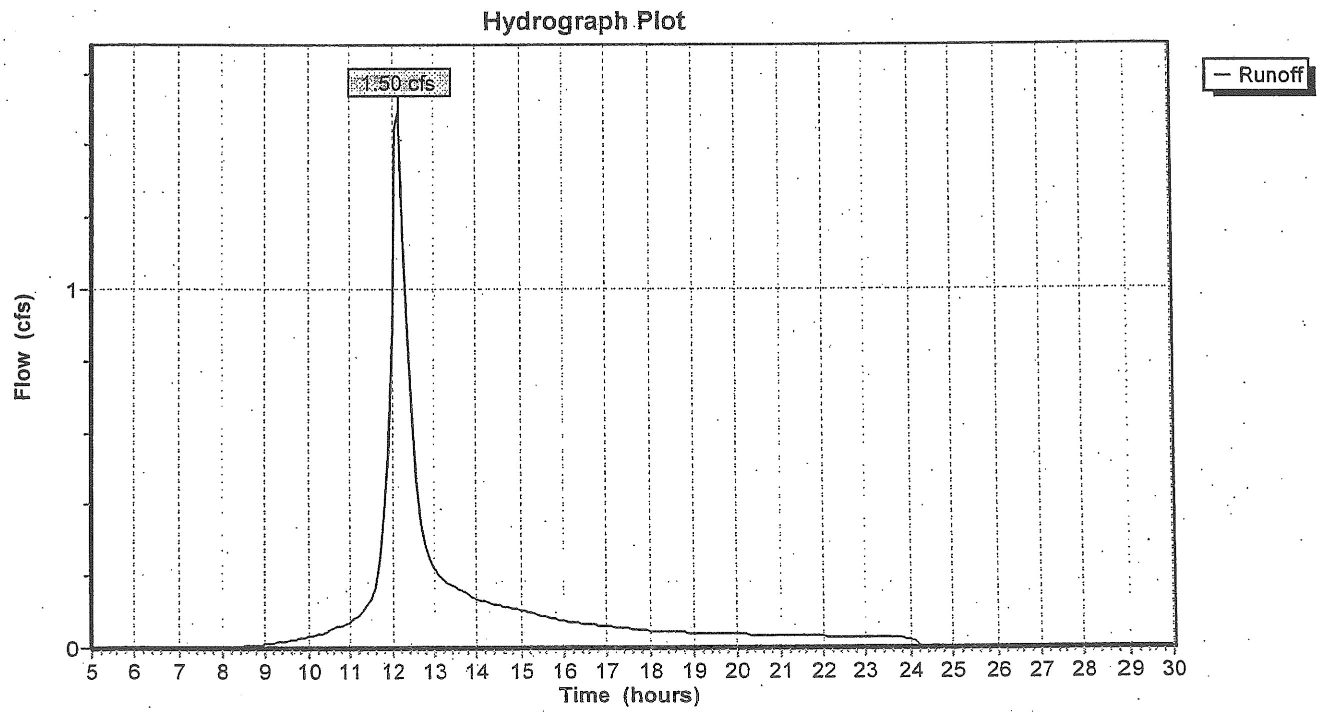
Runoff = 1.50 cfs @ 12.16 hrs, Volume= 0.145 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.240	73	Woods, Fair, HSG C
0.230	79	Woods, Fair, HSG D
0.120	74	>75% Grass cover, Good, HSG C
0.590	76	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	15	0.1333	0.2		**Sheet Flow, Segment AB** Grass: Short n= 0.150 P2= 3.00"
0.4	10	0.5000	0.4		**Sheet Flow, SegmentBC** Grass: Short n= 0.150 P2= 3.00"
3.9	45	0.3100	0.2		**Sheet Flow, Segment CD** Woods: Light underbrush n= 0.400 P2= 3.00"
6.9	30	0.0333	0.1		**Sheet Flow, DE** Woods: Light underbrush n= 0.400 P2= 3.00"
2.0	70	0.0140	0.6		**Shallow Concentrated Flow, SegmentDE** Woodland Kv= 5.0 fps
14.2	170	Total			

Subcatchment 14S: Proposed Northeast



Subcatchment 15S: Proposed Parking

Runoff = 2.38 cfs @ 11.99 hrs, Volume= 0.178 af

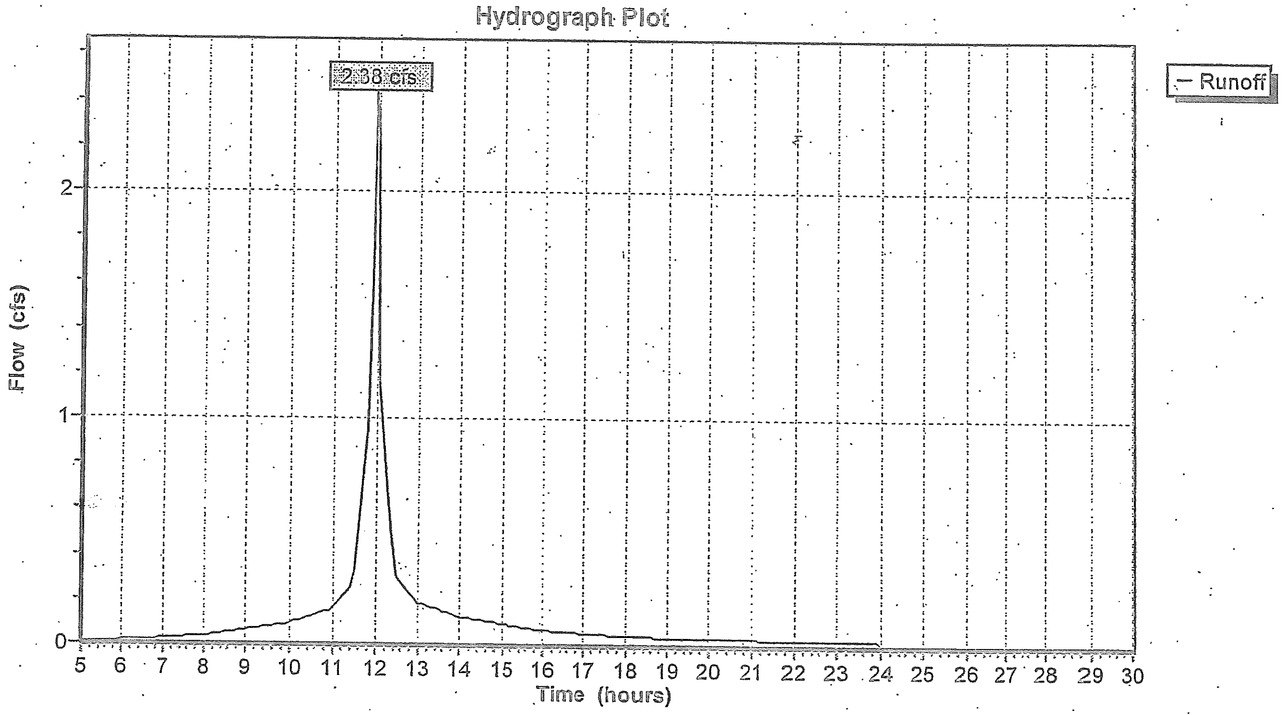
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.340	98	Paved parking & roofs
0.140	74	>75% Grass cover, Good, HSG C
0.480	91	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0333	1.6		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.00"
0.4	100	0.0333	3.7		**Shallow Concentrated Flow, BD** Paved Kv= 20.3 fps
1.4	200	Total			

Subcatchment 15S: Proposed Parking

Hydrograph Plot



Subcatchment 16S: Proposed Parking

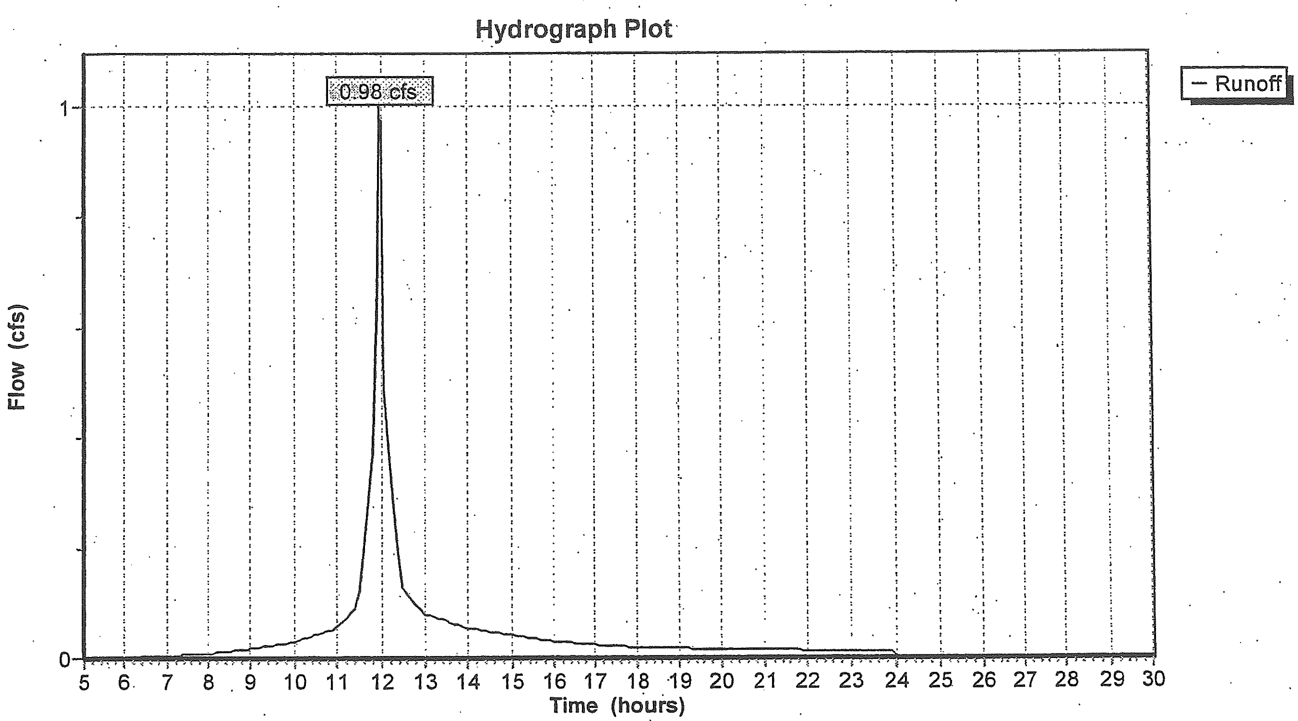
Runoff = 0.98 cfs @ 11.99 hrs, Volume= 0.070 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.100	98	Paved parking & roofs
0.120	74	>75% Grass cover, Good, HSG C
0.220	85	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	95	0.0333	1.6		**Sheet Flow, Segment AB** Smooth surfaces n= 0.011 P2= 3.00"
0.2	35	0.0300	3.5		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
0.3	50	0.1400	2.6		**Shallow Concentrated Flow, Segment CD** Short Grass Pasture Kv= 7.0 fps
1.5	180	Total			

Subcatchment 16S: Proposed Parking



Subcatchment 21S: Proposed Central

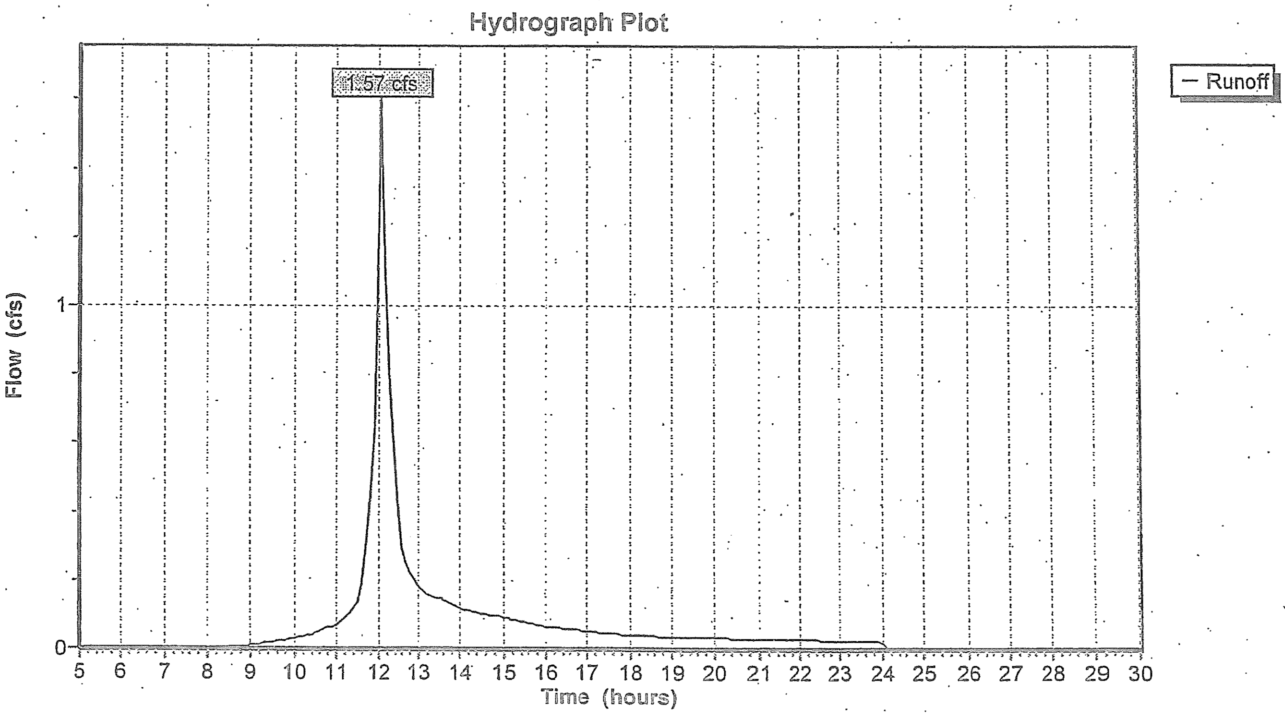
Runoff = 1.57 cfs @ 12.09 hrs, Volume= 0.130 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.180	73	WOODS (FAIR)-HSG "C"
0.150	74	OPEN SPACE (GOODG "C"
0.200	79	WOODS (FAIR)-HSD "D"
0.530	76	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	60	0.0417	0.2		**Sheet Flow, SegmentAB** Grass: Short n= 0.150 P2= 3.00"
2.2	40	0.1500	0.3		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
0.2	30	0.2700	2.6		**Shallow Concentrated Flow, Segment ID:CD** Woodland Kv= 5.0 fps
1.2	80	0.0500	1.1		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
8.6	210	Total			

Subcatchment 21S: Proposed Central



Subcatchment 22S: Existing Parking and Entrance Circle

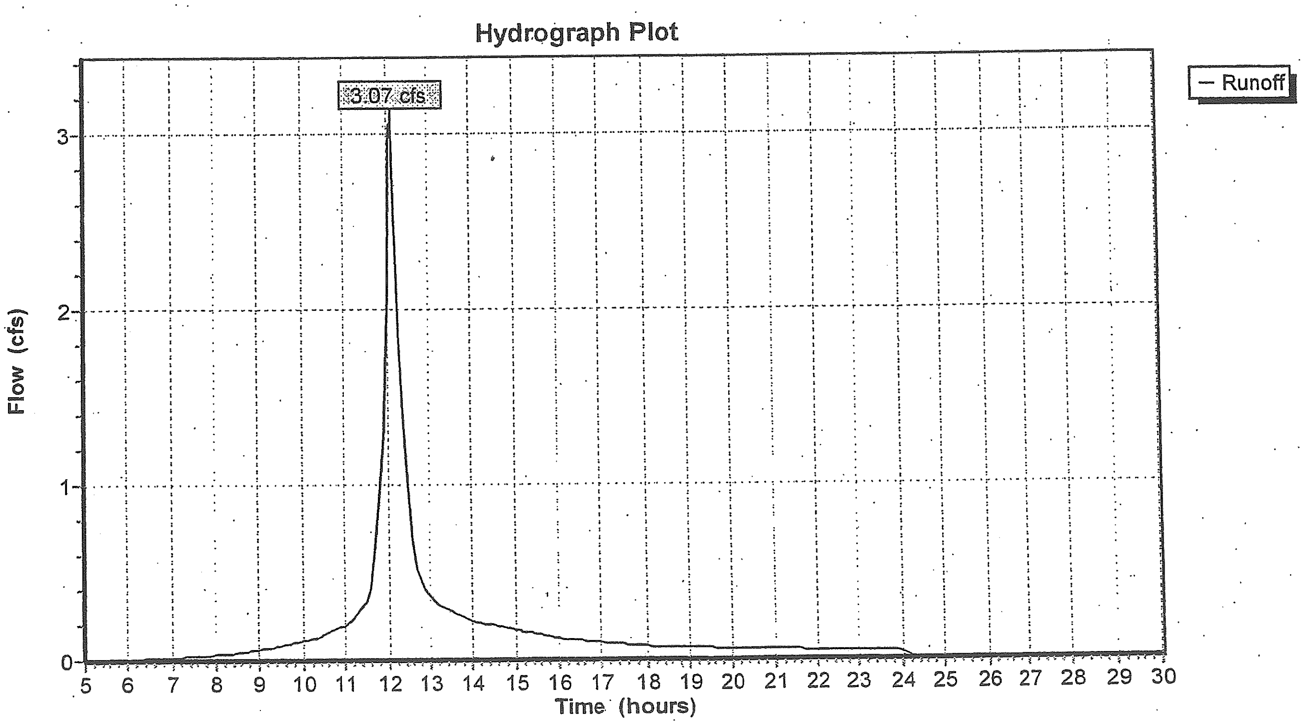
Runoff = 3.07 cfs @ 12.12 hrs, Volume= 0.275 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.070	73	WOODS (FAIR)-HSG "C"
0.400	74	OPEN SPACE (GOODG "C"
0.390	98	IMPERVIOUS (BLDG, PAVEMENT)
0.860	85	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	15	0.0167	0.1		**Sheet Flow, Segment ID:AB** Grass: Short n= 0.150 P2= 3.00"
0.4	20	0.0125	0.8		**Sheet Flow, SegmentBC** Smooth surfaces n= 0.011 P2= 3.00"
7.9	65	0.1100	0.1		**Sheet Flow, SegmentCD** Woods: Light underbrush n= 0.400 P2= 3.00"
0.8	75	0.0880	1.5		**Shallow Concentrated Flow, Segment ID:DE** Woodland Kv= 5.0 fps
0.3	180	0.0330	9.7	7.65	**Circular Channel (pipe), SegmentEF** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011
11.8	355	Total			

Subcatchment 22S: Existing Parking and Entrance Circle



Subcatchment 23S: Proposed Buildings

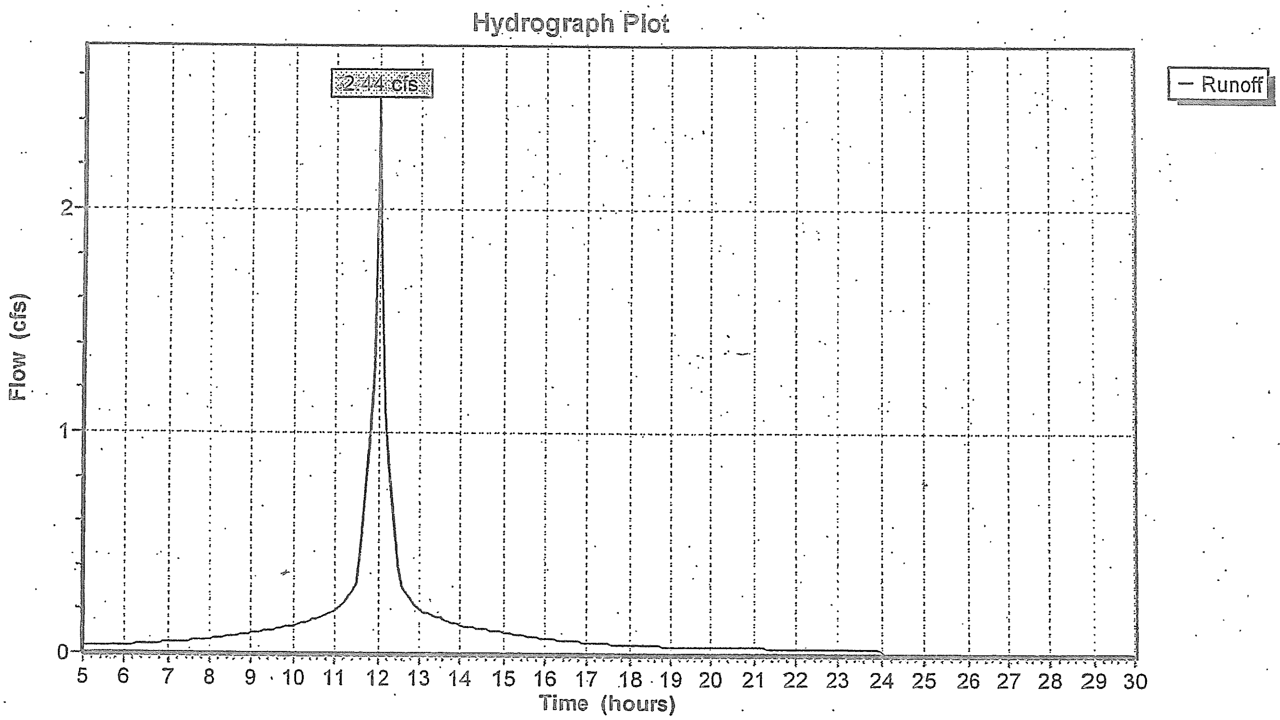
Runoff = 2.44 cfs @ 12.02 hrs, Volume= 0.205 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.480	98	Paved parking & roofs

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

Subcatchment 23S: Proposed Buildings



Subcatchment 24S: Expanded Parking

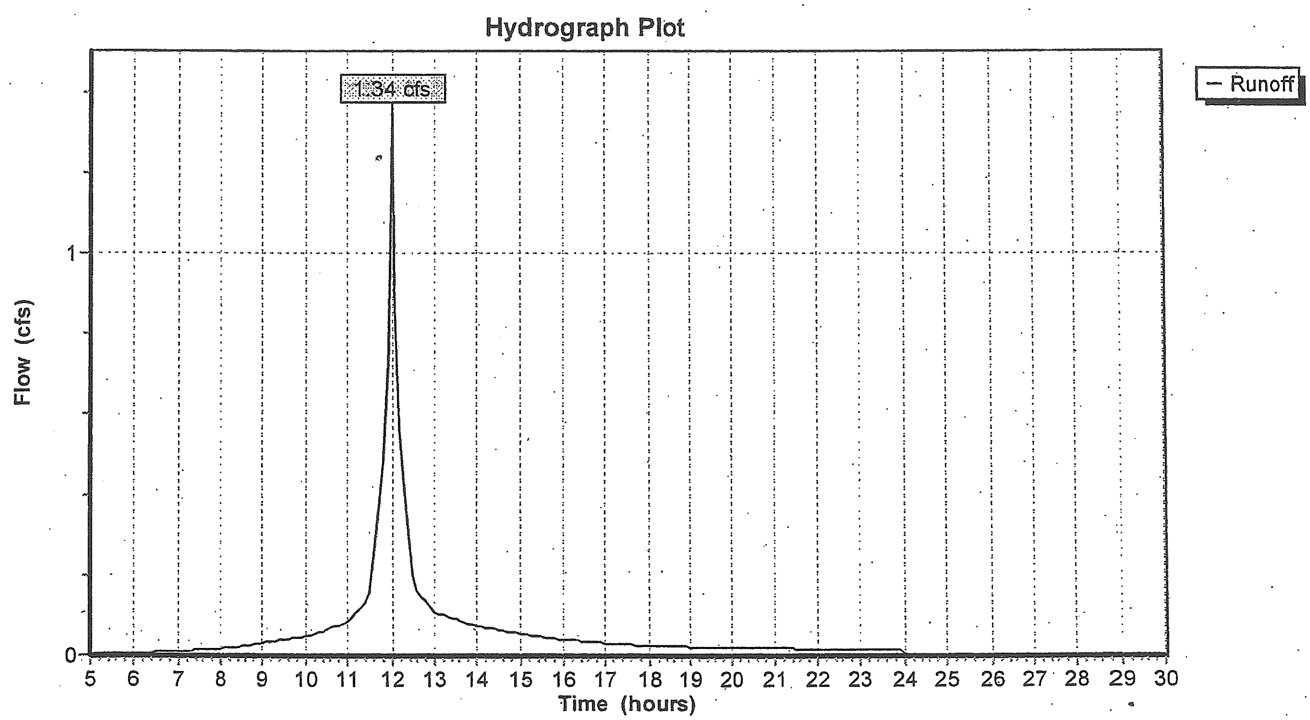
Runoff = 1.34 cfs @ 12.01 hrs, Volume= 0.099 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.170	98	Paved parking & roofs
0.110	74	>75% Grass cover, Good, HSG C
0.280	89	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	10	0.0100	0.1		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.00"
0.6	10	0.2000	0.3		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.00"
0.7	80	0.0600	2.0		**Sheet Flow, CD** Smooth surfaces n= 0.011 P2= 3.00"
0.4	100	0.0400	4.1		**Shallow Concentrated Flow, DE** Paved Kv= 20.3 fps
3.8	200	Total			

Subcatchment 24S: Expanded Parking



Subcatchment 25S: Access & Rear Parking

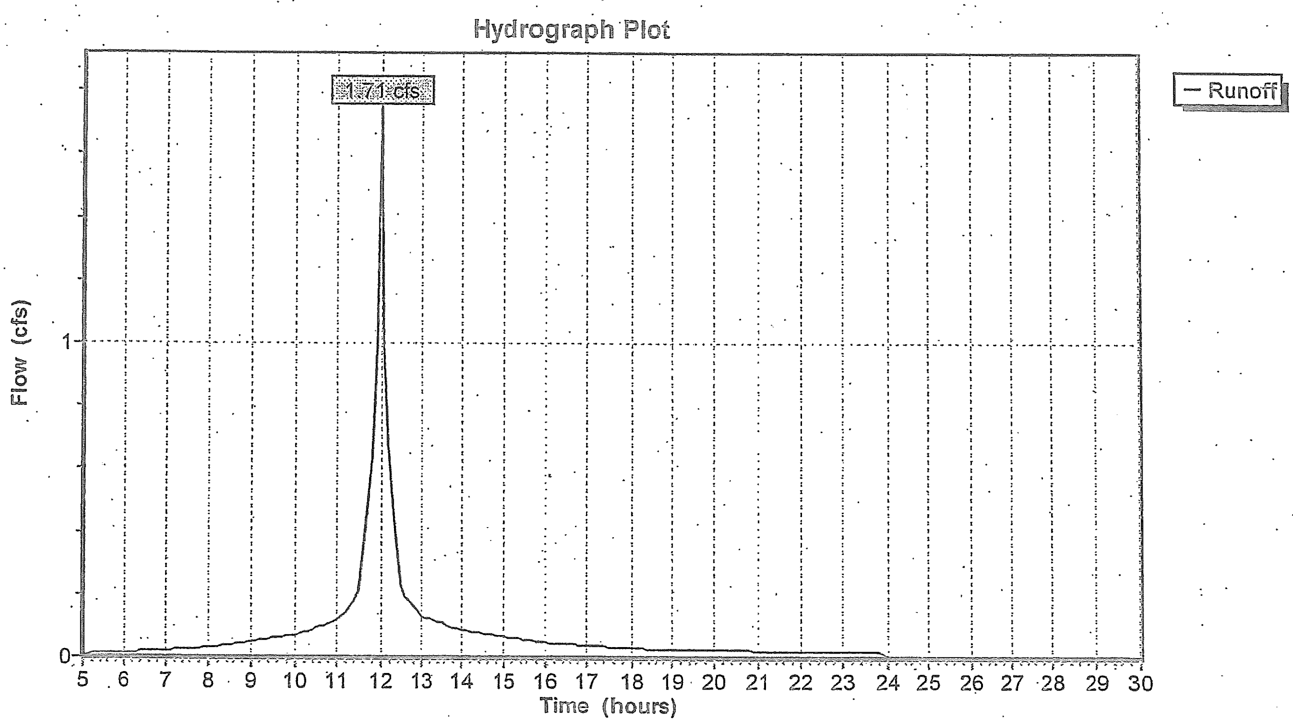
Runoff = 1.71 cfs @ 12.00 hrs, Volume= 0.128 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.260	98	Paved parking & roofs
0.070	74	>75% Grass cover, Good, HSG C
0.330	93	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	15	0.0333	0.1		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.00"
0.8	85	0.0400	1.7		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.00"
0.6	110	0.0250	3.2		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
3.2	210	Total			

Subcatchment 25S: Access & Rear Parking



Subcatchment 26S: Rear of Building

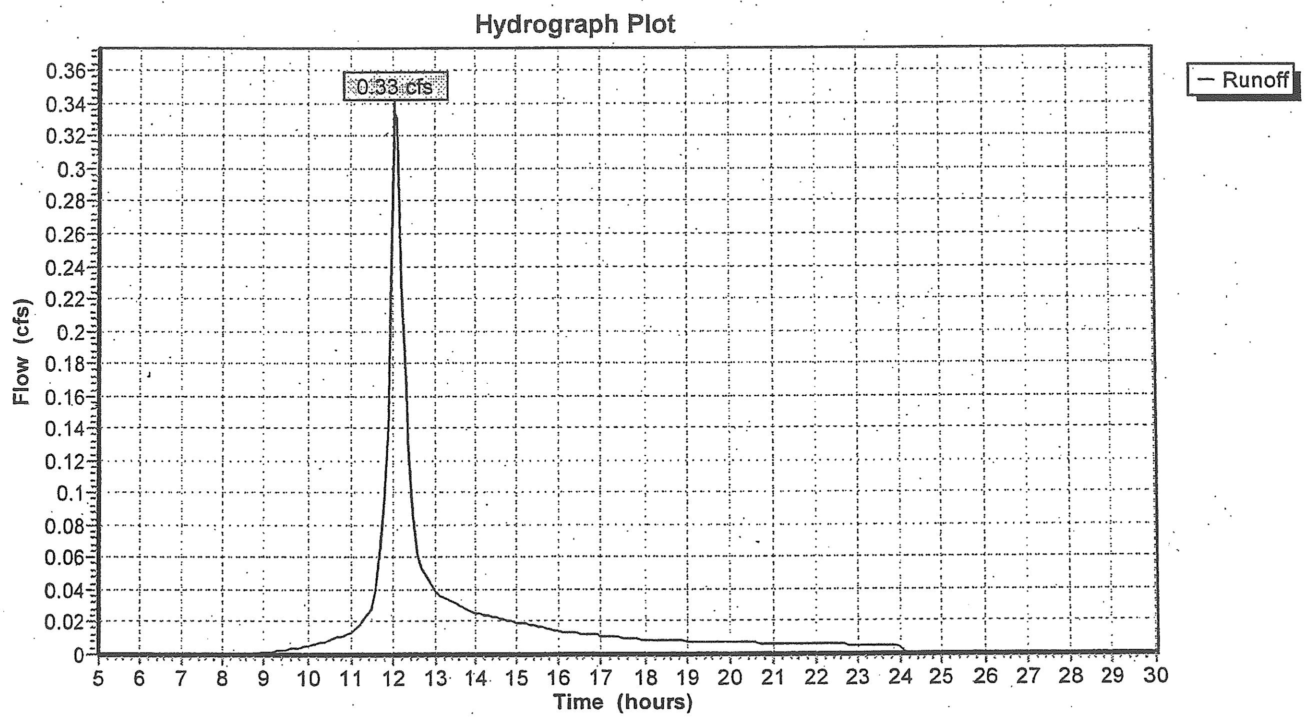
Runoff = 0.33 cfs @ 12.08 hrs, Volume= 0.028 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr Rainfall=5.50"

Area (ac)	CN	Description
0.120	74	>75% Grass cover, Good, HSG C

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	10	0.2000	0.3		**Sheet Flow, Segment AB** Grass: Short n= 0.150 P2= 3.00"
6.4	90	0.0500	0.2		**Sheet Flow, Segment BC** Grass: Short n= 0.150 P2= 3.00"
0.8	100	0.0900	2.1		**Shallow Concentrated Flow, Segment CD** Short Grass Pasture Kv= 7.0 fps
7.8	200	Total			

Subcatchment 26S: Rear of Building



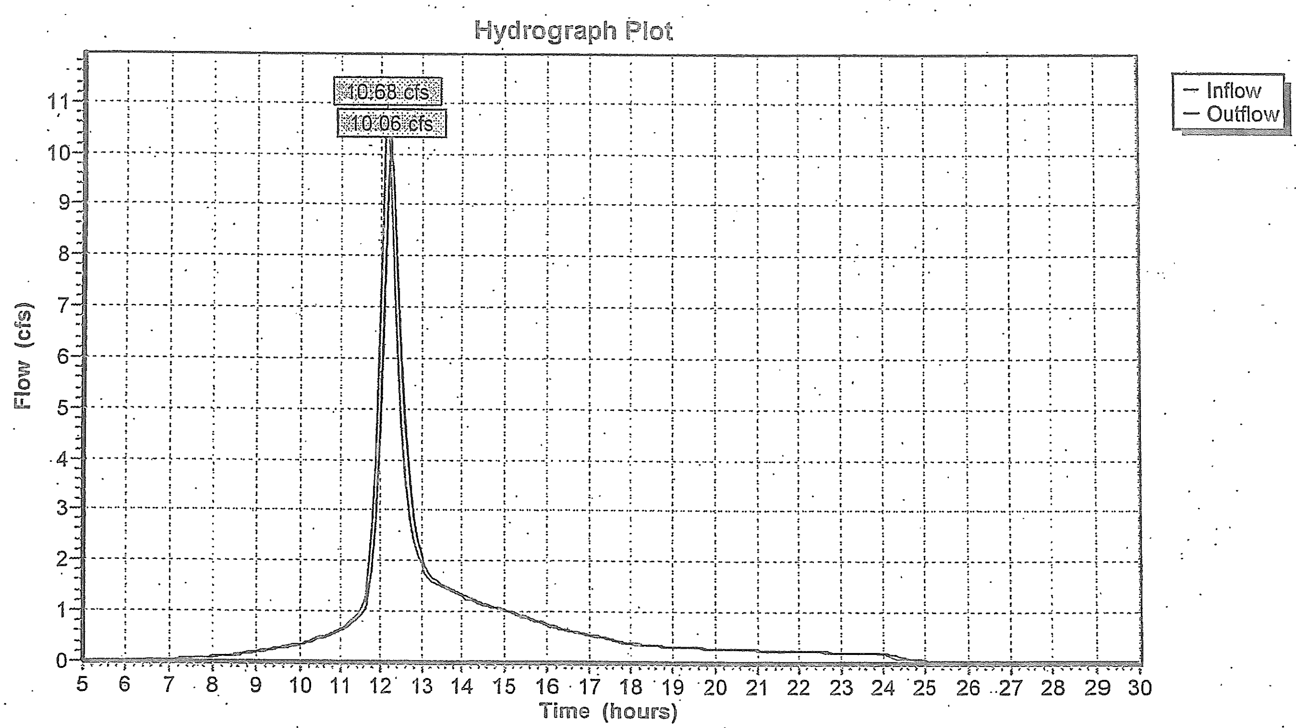
Reach 1R: Existing Swale

Inflow = 10.68 cfs @ 12.14 hrs, Volume= 1.215 af
Outflow = 10.06 cfs @ 12.24 hrs, Volume= 1.214 af, Atten= 6%, Lag= 5.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.2 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.3 fps, Avg. Travel Time= 9.8 min

Peak Depth= 0.93'
Capacity at bank full= 43.53 cfs
Inlet Invert= 30.00', Outlet Invert= 29.50'
7.00' x 2.00' deep channel, n= 0.050 Length= 200.0' Slope= 0.0025 '/'
Side Slope Z-value= 3.0 2.0 '/'

Reach 1R: Existing Swale



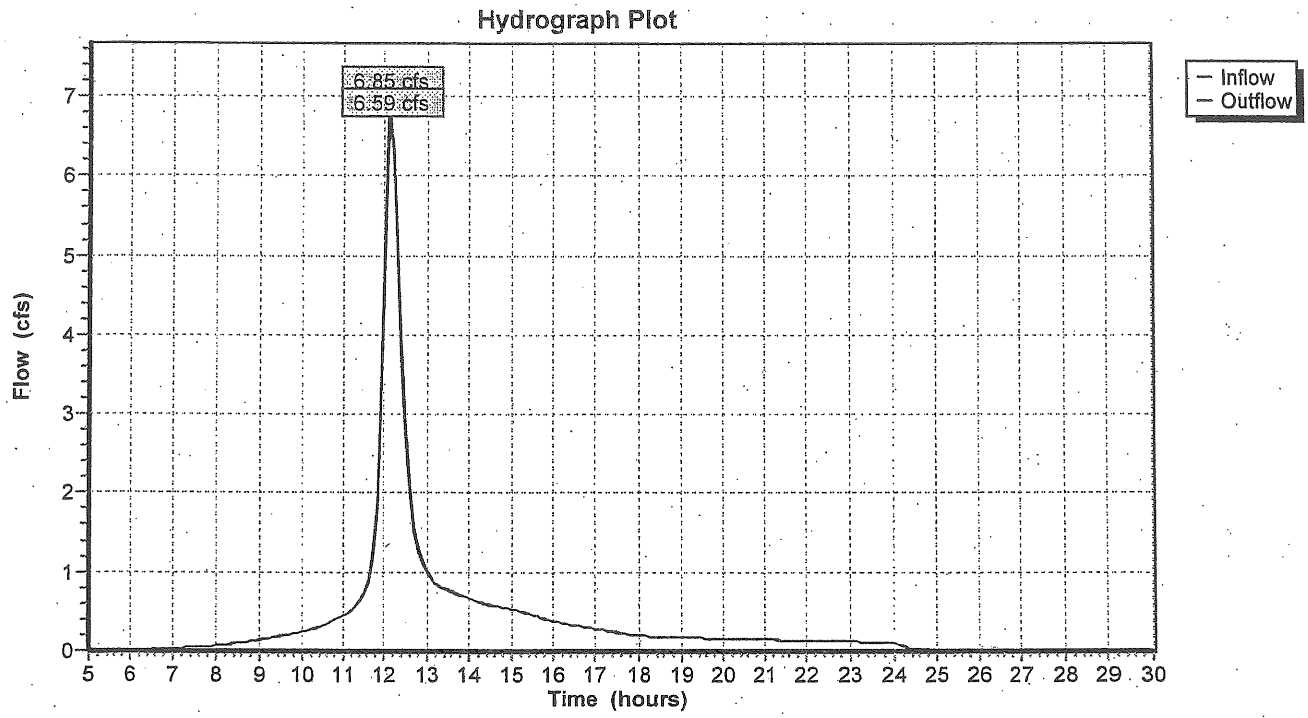
Reach 2R: Existing Swale

Inflow = 6.85 cfs @ 12.13 hrs, Volume= 0.703 af
Outflow = 6.59 cfs @ 12.16 hrs, Volume= 0.703 af, Atten= 4%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.8 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.5 fps, Avg. Travel Time= 2.5 min

Peak Depth= 0.60'
Capacity at bank full= 144.69 cfs
Inlet Invert= 30.80', Outlet Invert= 30.00'
5.00' x 3.00' deep channel, n= 0.050 Length= 80.0' Slope= 0.0100 '/'
Side Slope Z-value= 2.0 '/'

Reach 2R: Existing Swale



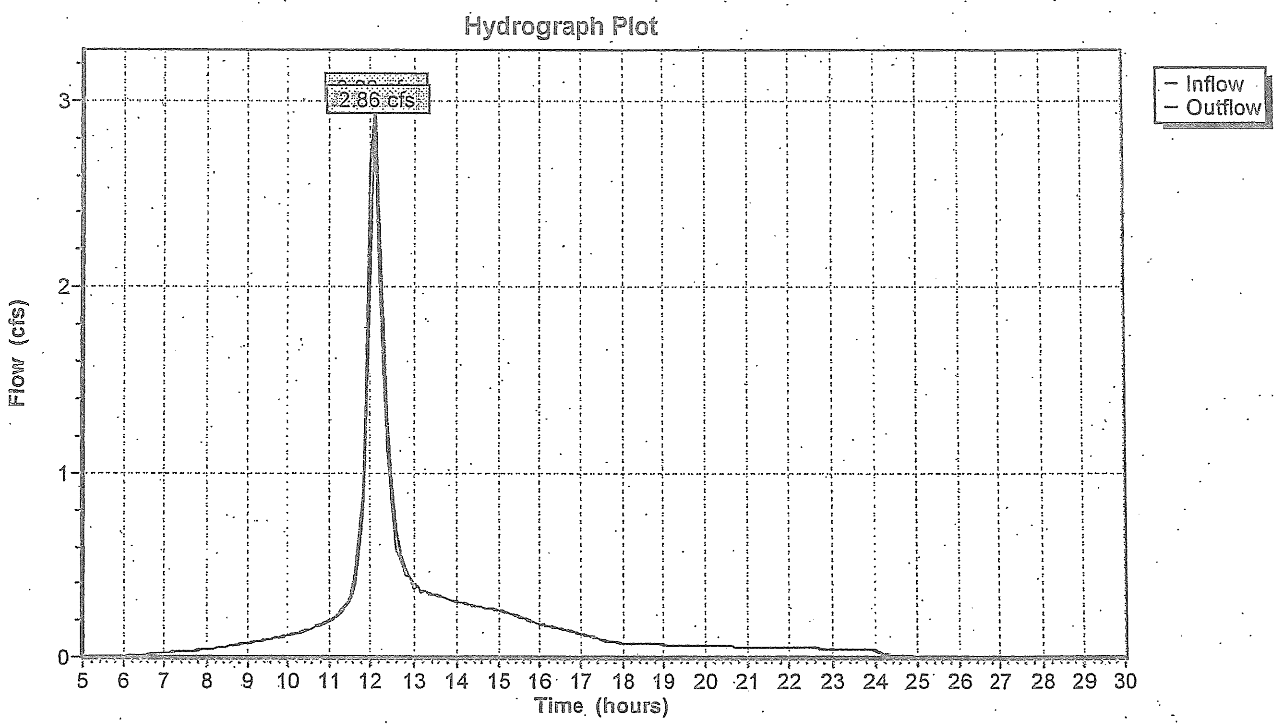
Reach 3R: Existing Swale

Inflow = 2.92 cfs @ 12.07 hrs, Volume= 0.297 af
Outflow = 2.86 cfs @ 12.12 hrs, Volume= 0.297 af, Atten= 2%, Lag= 2.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.4 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.4 fps, Avg. Travel Time= 5.1 min

Peak Depth= 0.37'
Capacity at bank full= 63.42 cfs
Inlet Invert= 32.00', Outlet Invert= 30.80'
5.00' x 2.00' deep channel, n= 0.050 Length= 120.0' Slope= 0.0100 '/'
Side Slope Z-value= 2.0 '/'

Reach 3R: Existing Swale



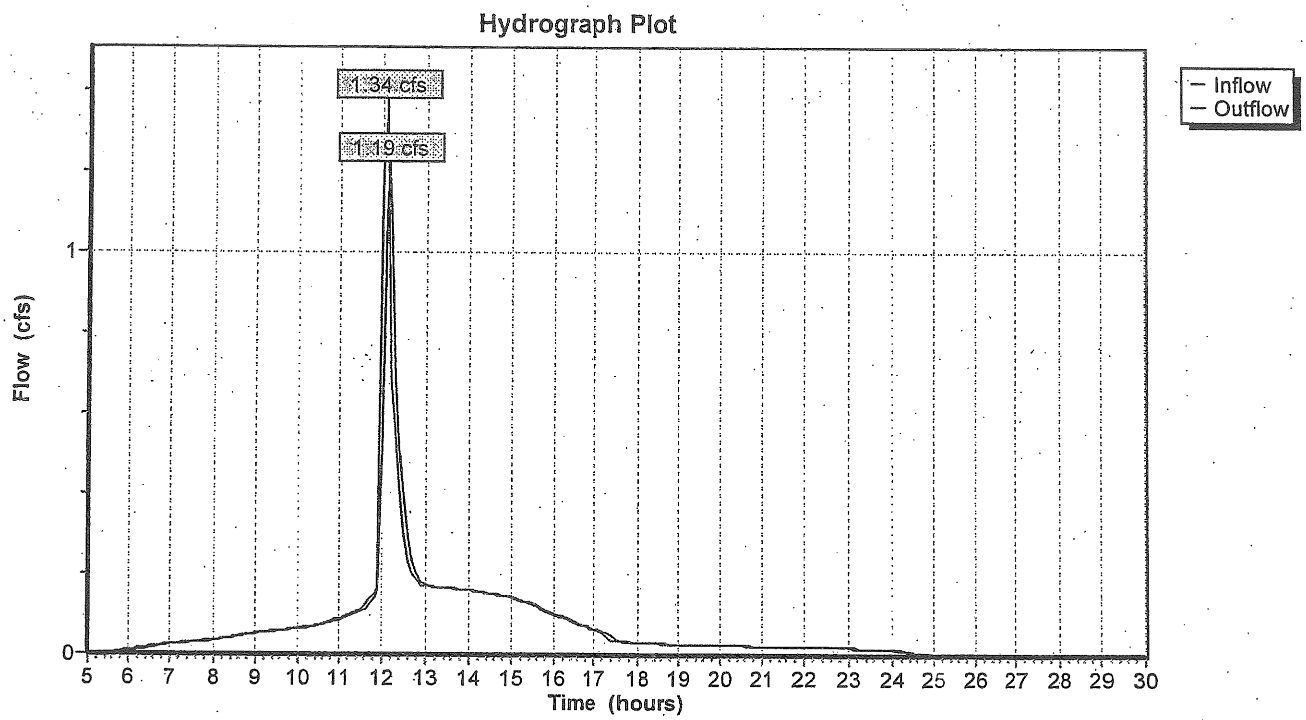
Reach R11: From P11 to Swale

Inflow = 1.34 cfs @ 12.06 hrs, Volume= 0.129 af
Outflow = 1.19 cfs @ 12.14 hrs, Volume= 0.129 af, Atten= 12%, Lag= 4.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.5 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 9.0 min

Peak Depth= 0.17'
Capacity at bank full= 33.01 cfs
Inlet Invert= 45.90', Outlet Invert= 32.00'
15.00' x 1.00' deep channel, n= 0.400 Length= 70.0' Slope= 0.1986 '/'
Side Slope Z-value= 10.0 '/'

Reach R11: From P11 to Swale

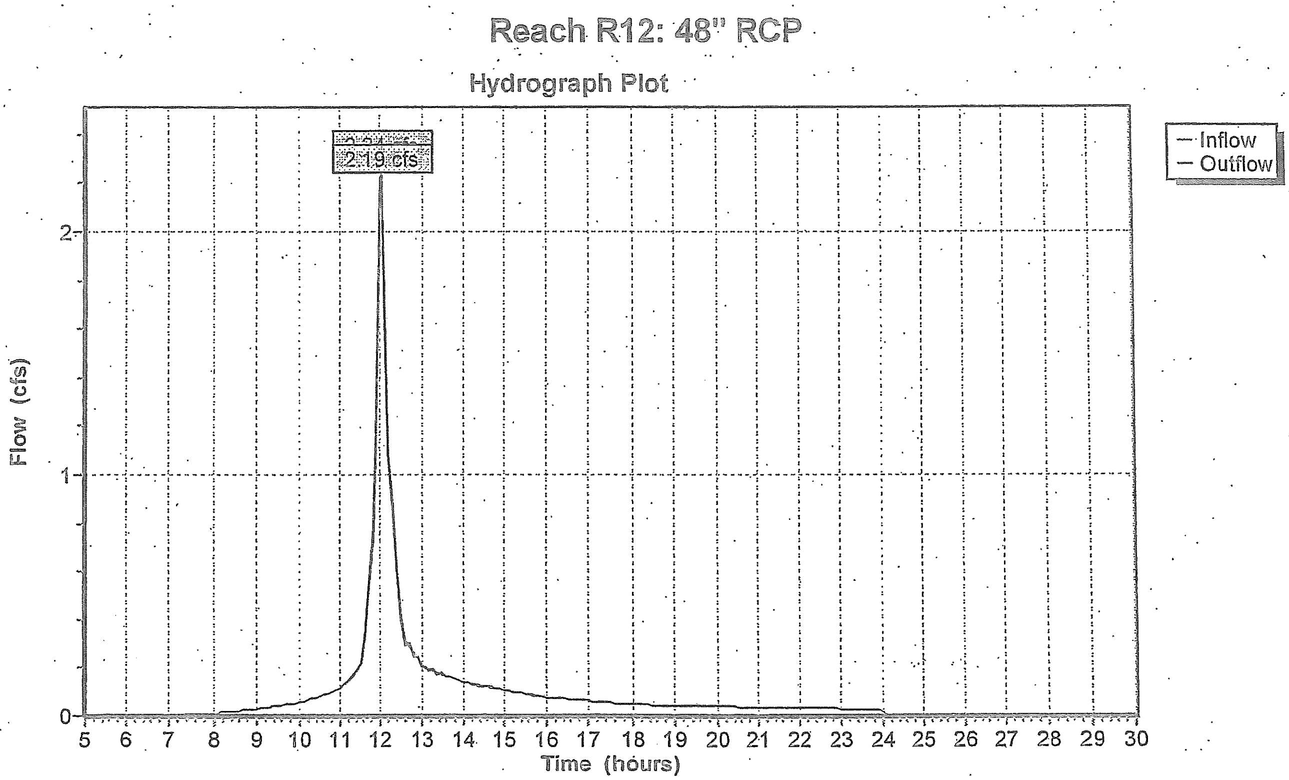


Reach R12: 48" RCP

Inflow	=	2.24 cfs @	12.02 hrs, Volume=	0.169 af
Outflow	=	2.19 cfs @	12.02 hrs, Volume=	0.169 af, Atten= 2%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 9.4 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.8 fps, Avg. Travel Time= 0.4 min

Peak Depth= 0.20'
Capacity at bank full= 463.95 cfs
Inlet Invert= 40.00', Outlet Invert= 32.00'
48.0" Diameter Pipe n= 0.012 Length= 90.0' Slope= 0.0889 '/'



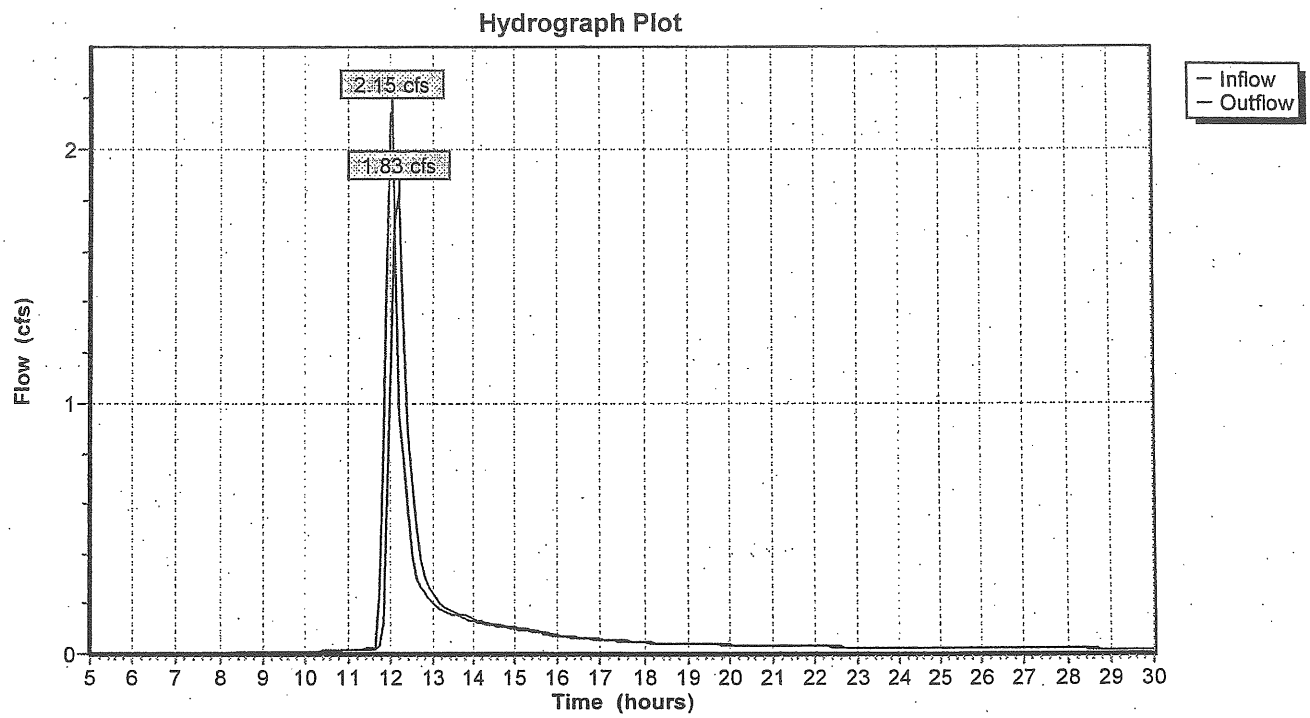
Reach R15: From P15 to Swale

Inflow = 2.15 cfs @ 12.01 hrs, Volume= 0.152 af
Outflow = 1.83 cfs @ 12.16 hrs, Volume= 0.151 af, Atten= 15%, Lag= 9.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.3 fps, Min. Travel Time= 4.8 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 18.6 min

Peak Depth= 0.41'
Capacity at bank full= 45.62 cfs
Inlet Invert= 34.00', Outlet Invert= 30.00'
10.00' x 2.00' deep channel, n= 0.400 Length= 100.0' Slope= 0.0400 '/'
Side Slope Z-value= 2.0 15.0 '/'

Reach R15: From P15 to Swale



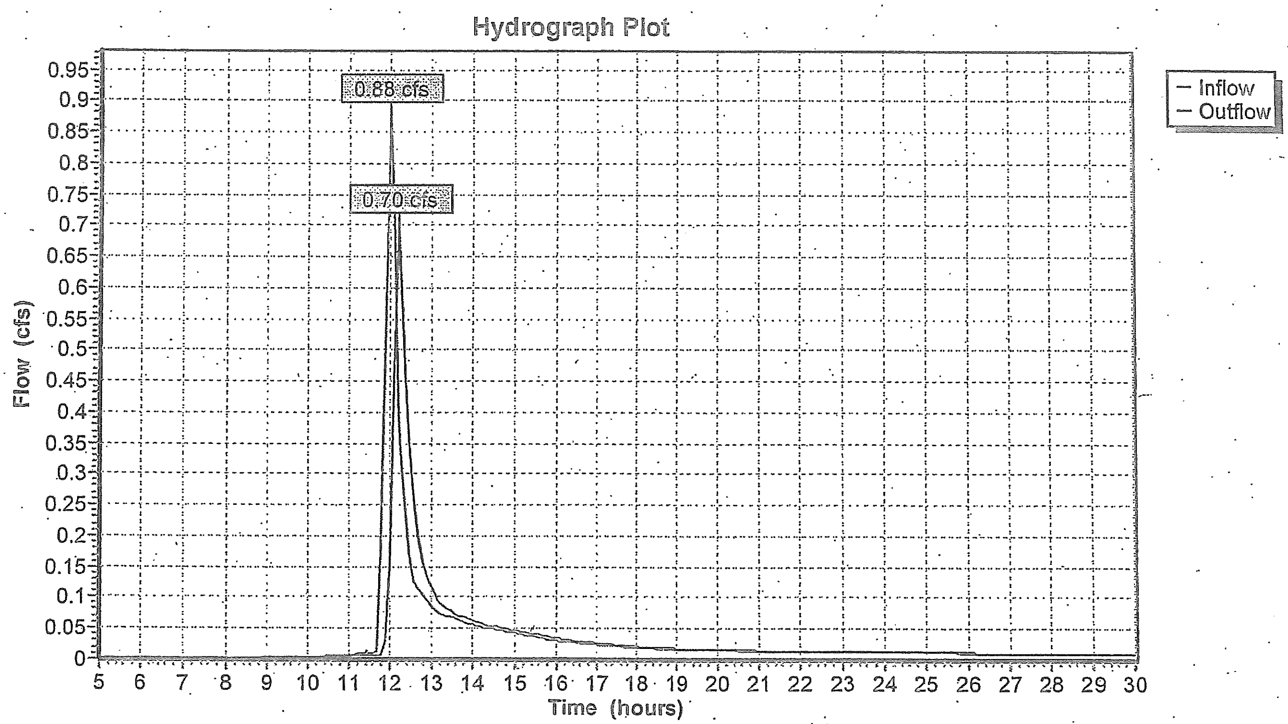
Reach R16: From P16 to Swale

Inflow	=	0.88 cfs @	12.02 hrs,	Volume=	0.063 af
Outflow	=	0.70 cfs @	12.23 hrs,	Volume=	0.062 af, Atten= 20%, Lag= 12.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.3 fps, Min. Travel Time= 7.3 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 28.3 min

Peak Depth= 0.12'
Capacity at bank full= 28.43 cfs
Inlet Invert= 41.00', Outlet Invert= 29.50'
20.00' x 1.00' deep channel, n= 0.400 Length= 120.0' Slope= 0.0958 '/'
Side Slope Z-value= 10.0 '/'

Reach R16: From P16 to Swale



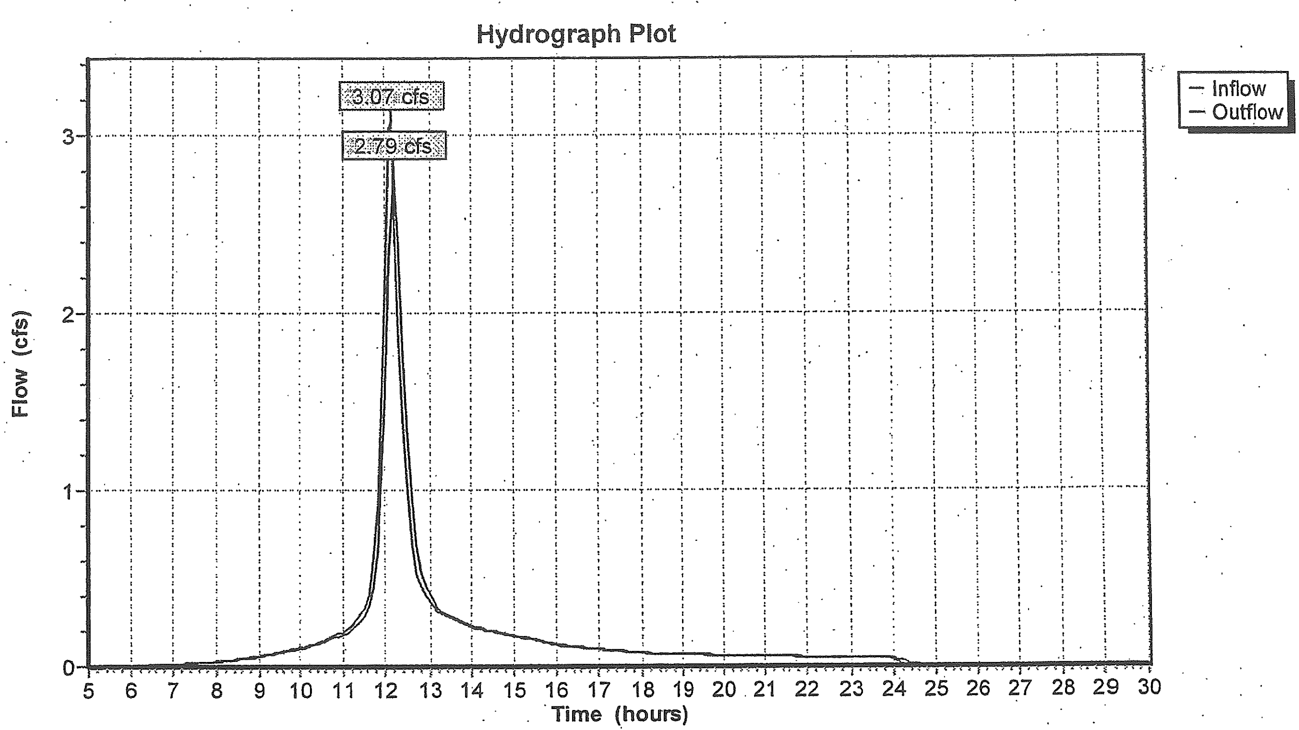
Reach R22: From 22 to Swale

Inflow	=	3.07 cfs @	12.12 hrs,	Volume=	0.275 af
Outflow	=	2.79 cfs @	12.20 hrs,	Volume=	0.275 af, Atten= 9%, Lag= 5.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.6 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 0.2 fps, Avg. Travel Time= 9.7 min

Peak Depth= 0.29'
Capacity at bank full= 27.37 cfs
Inlet Invert= 44.00', Outlet Invert= 30.50'
15.00' x 1.00' deep channel, n= 0.400 Length= 90.0' Slope= 0.1500 '/'
Side Slope Z-value= 15.0 2.0 '/'

Reach R22: From 22 to Swale

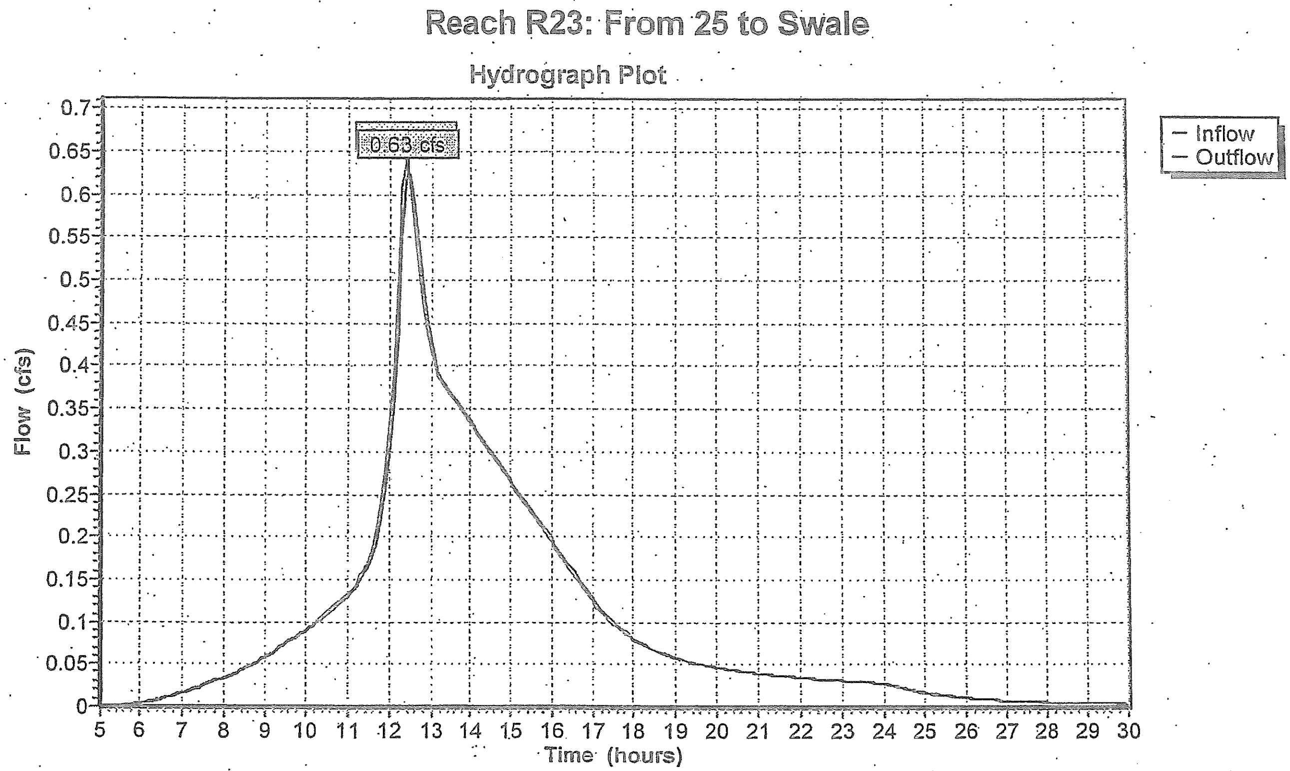


Reach R23: From 25 to Swale

Inflow	=	0.64 cfs @ 12.40 hrs, Volume=	0.202 af	
Outflow	=	0.63 cfs @ 12.46 hrs, Volume=	0.202 af,	Atten= 2%, Lag= 3.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.4 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 0.2 fps, Avg. Travel Time= 5.1 min

Peak Depth= 0.14'
Capacity at bank full= 28.77 cfs
Inlet Invert= 39.00', Outlet Invert= 30.00'
10.00' x 1.00' deep channel, n= 0.400 Length= 50.0' Slope= 0.1800 '/'
Side Slope Z-value= 15.0 '/'



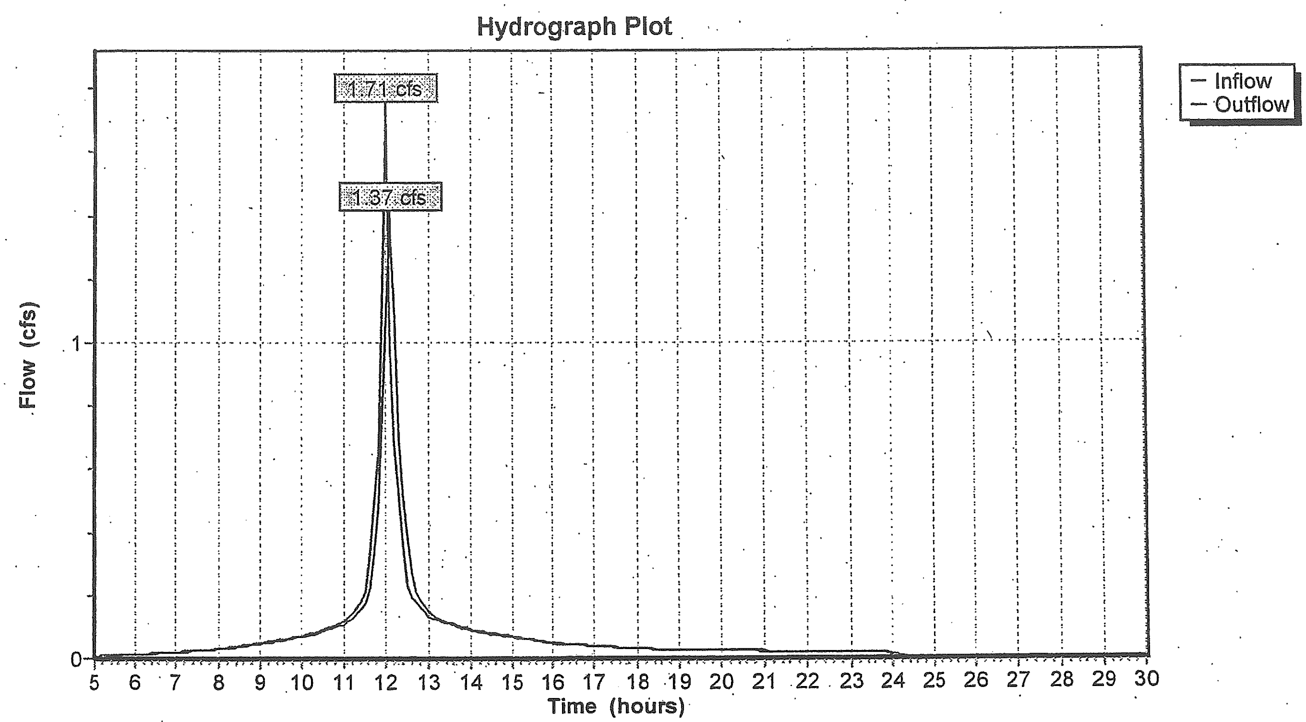
Reach R25: 24 to Dry Swale

Inflow	=	1.71 cfs @	12.00 hrs, Volume=	0.128 af
Outflow	=	1.37 cfs @	12.10 hrs, Volume=	0.128 af, Atten= 20%, Lag= 6.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.5 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 0.2 fps, Avg. Travel Time= 10.3 min

Peak Depth= 0.70'
Capacity at bank full= 7.62 cfs
Inlet Invert= 39.50', Outlet Invert= 34.00'
2.00' x 1.50' deep channel, n= 0.400 Length= 100.0' Slope= 0.0550 '/'
Side Slope Z-value= 3.0 '/'

Reach R25: 24 to Dry Swale



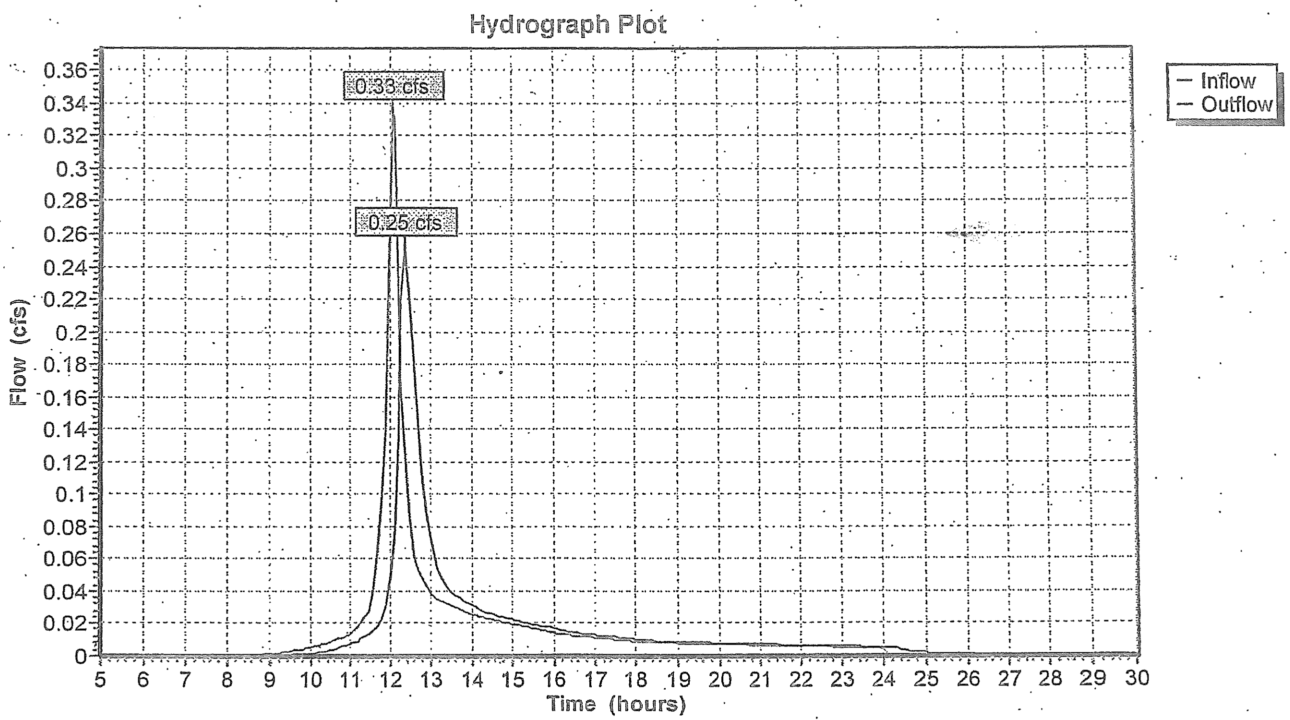
Reach R26: From 26 to SP

Inflow	=	0.33 cfs @ 12.08 hrs,	Volume=	0.028 af
Outflow	=	0.25 cfs @ 12.40 hrs,	Volume=	0.028 af, Atten= 25%, Lag= 19.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.2 fps, Min. Travel Time= 12.1 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 39.3 min

Peak Depth= 0.28'
Capacity at bank full= 10.11 cfs
Inlet Invert= 35.00', Outlet Invert= 29.50'
3.00' x 2.00' deep channel, n= 0.400 Length= 180.0' Slope= 0.0306 '/'
Side Slope Z-value= 2.0 '/'

Reach R26: From 26 to SP



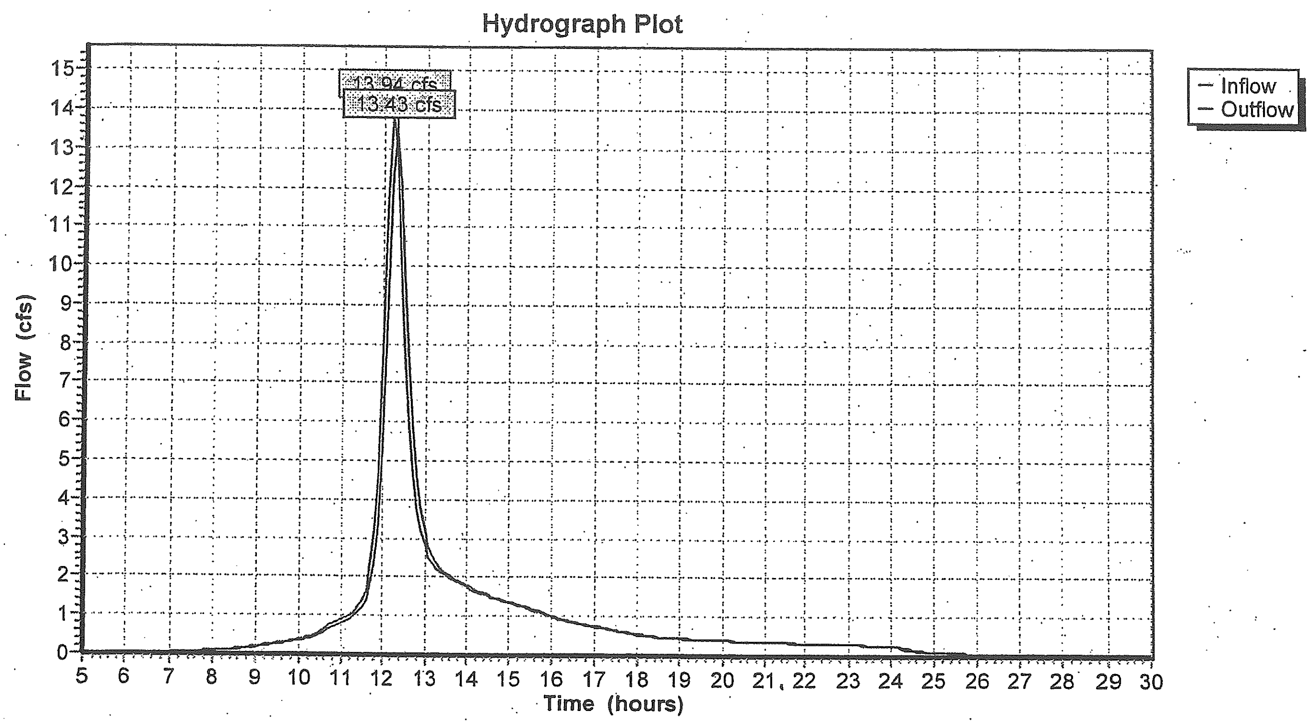
Reach SP: Study Point

Inflow	=	13.94 cfs @	12.22 hrs,	Volume=	1.664 af
Outflow	=	13.43 cfs @	12.30 hrs,	Volume=	1.662 af, Atten= 4%, Lag= 5.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs
Max. Velocity= 0.6 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 0.2 fps, Avg. Travel Time= 9.9 min

Peak Depth= 0.59'
Capacity at bank full= 239.77 cfs
Inlet Invert= 29.50', Outlet Invert= 29.40'
35.00' x 3.00' deep channel, n= 0.050 Length= 100.0' Slope= 0.0010 '/'
Side Slope Z-value= 5.0 4.0 '/'

Reach SP: Study Point



Pond P11: Existing Satellite Lot Detention Pond

Inflow	=	1.70 cfs @	11.99 hrs,	Volume=	0.130 af
Outflow	=	1.34 cfs @	12.06 hrs,	Volume=	0.129 af, Atten= 21%, Lag= 4.4 min
Primary	=	0.18 cfs @	12.06 hrs,	Volume=	0.100 af
Secondary	=	1.16 cfs @	12.06 hrs,	Volume=	0.029 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 48.73' Storage= 1,169 cf
Plug-Flow detention time= 44.2 min calculated for 0.128 af (99% of inflow)
Storage and wetted areas determined by Prismatic sections

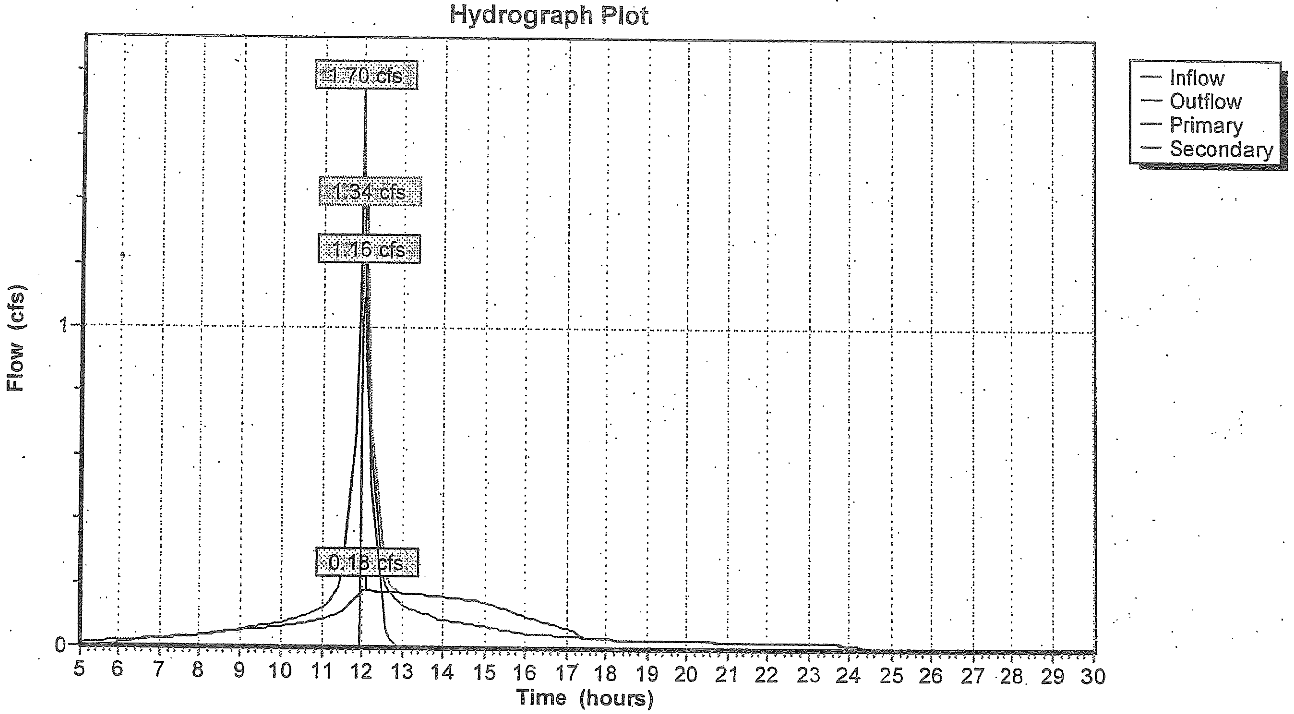
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.00	10	0	0
47.00	117	64	64
48.00	674	396	459
49.00	1,276	975	1,434

Primary OutFlow (Free Discharge)
├─1=Orifice/Grate
└─2=Orifice/Grate

Secondary OutFlow (Free Discharge)
└─3=Sharp-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	46.50'	**1.0" Vert. Orifice/Grate** C= 0.600
2	Primary	46.80'	**2.0" Vert. Orifice/Grate** C= 0.600
3	Secondary	48.50'	**3.1' long x 0.5' high Sharp-Crested Rectangular Weir** 0 End Contraction(s)

Pond P11: Existing Satellite Lot Detention Pond



Pond P15: Pond 15

Inflow	=	2.38 cfs @	11.99 hrs,	Volume=	0.178 af
Outflow	=	2.15 cfs @	12.01 hrs,	Volume=	0.152 af, Atten= 10%, Lag= 1.6 min
Primary	=	0.03 cfs @	12.01 hrs,	Volume=	0.039 af
Secondary	=	2.12 cfs @	12.01 hrs,	Volume=	0.113 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 40.74' Storage= 1,988 cf
Plug-Flow detention time= 167.3 min calculated for 0.152 af (85% of inflow)
Storage and wetted areas determined by Prismatic sections

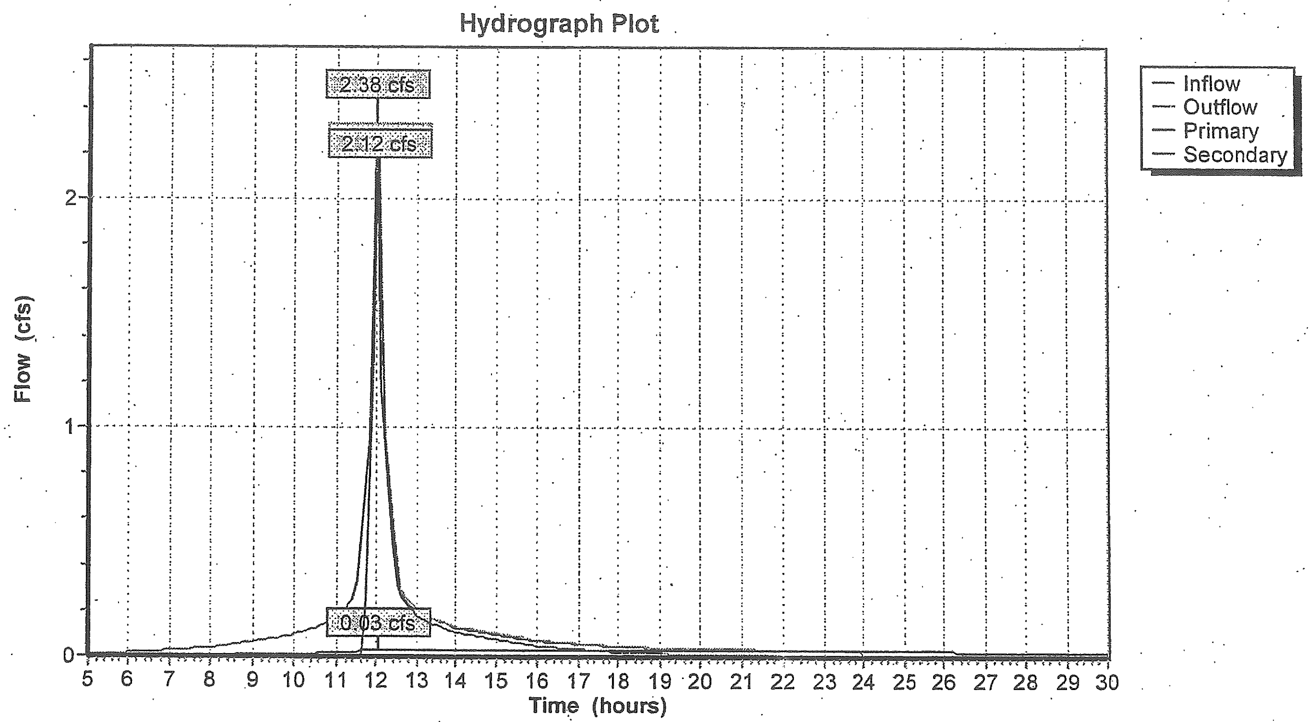
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.00	724	0	0
40.00	1,189	957	957
40.50	1,443	658	1,615
41.00	1,711	789	2,403
42.00	2,290	2,001	4,404

Primary OutFlow (Free Discharge)
└─2=Culvert
　└─1=Exfiltration

Secondary OutFlow (Free Discharge)
└─3=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Device 2	39.00'	**0.002000 fpm Exfiltration over Surface area above invert**
2	Primary	36.50'	**6.0" x 80.0' long Culvert** RCP, groove end projecting, Ke= 0.200 Outlet Invert= 35.00' S= 0.0187 '/' n= 0.011 Cc= 0.900
3	Secondary	40.50'	**7.0' long x 13.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.62 2.66 2.70 2.66 2.65 2.66 2.65 2.63

Pond P15: Pond 15



Pond P16: Pond 16

Inflow =	0.98 cfs @	11.99 hrs,	Volume=	0.070 af
Outflow =	0.88 cfs @	12.02 hrs,	Volume=	0.063 af, Atten= 11%, Lag= 1.7 min
Primary =	0.02 cfs @	12.02 hrs,	Volume=	0.020 af
Secondary =	0.86 cfs @	12.02 hrs,	Volume=	0.043 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 45.73' Storage= 712 cf
Plug-Flow detention time= 156.0 min calculated for 0.063 af (89% of inflow)
Storage and wetted areas determined by Prismatic sections

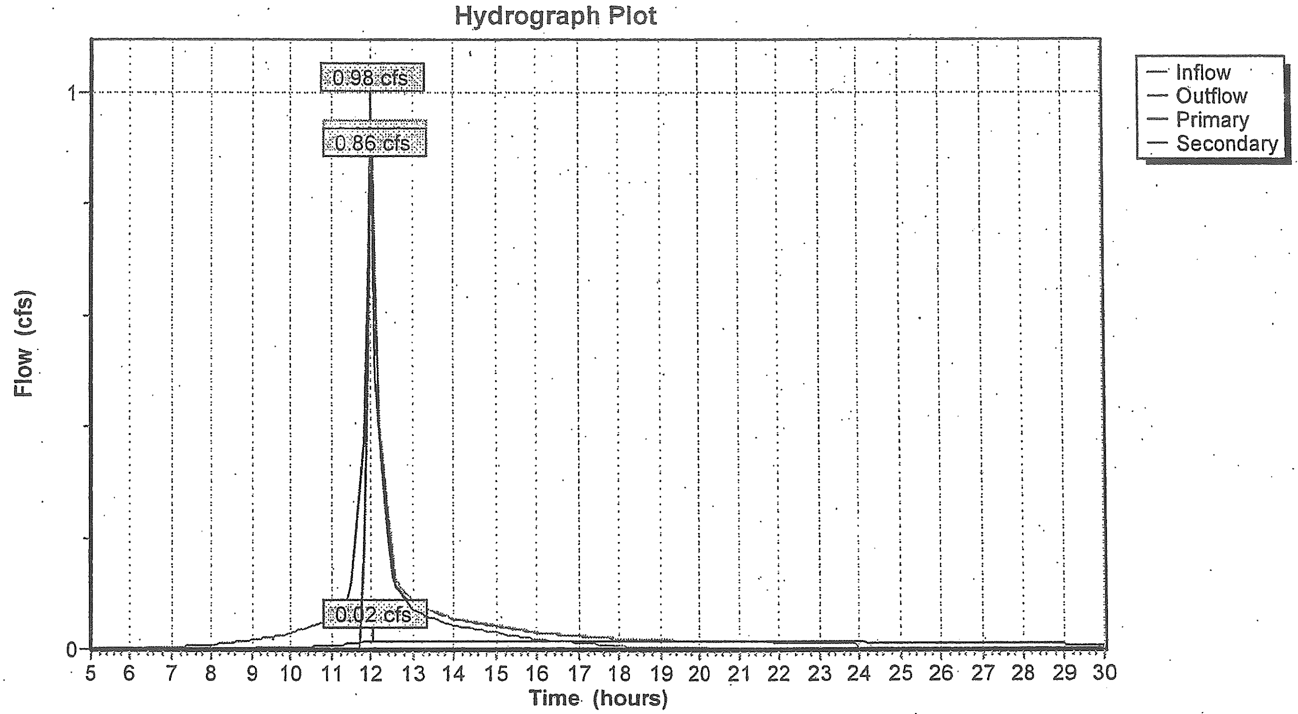
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.00	190	0	0
45.00	430	310	310
45.50	573	251	561
46.00	751	331	892
47.00	1,145	948	1,840

Primary OutFlow (Free Discharge)
└—2=Culvert
  └—1=Exfiltration

Secondary OutFlow (Free Discharge)
└—3=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Device 2	44.00'	**0.002000 fpm Exfiltration over Surface area above invert**
2	Primary	41.50'	**6.0" x 50.0' long Culvert** RCP, groove end projecting, Ke= 0.200 Outlet Invert= 41.00' S= 0.0100 '/' n= 0.011 Cc= 0.900
3	Secondary	45.50'	**3.0' long x 13.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.62 2.66 2.70 2.66 2.65 2.66 2.65 2.63

Pond P16: Pond 16



Pond P23: Pond 23

Inflow = 2.44 cfs @ 12.02 hrs, Volume= 0.205 af
Outflow = 0.64 cfs @ 12.40 hrs, Volume= 0.202 af, Atten= 74%, Lag= 23.0 min
Primary = 0.43 cfs @ 12.40 hrs, Volume= 0.194 af
Secondary = 0.20 cfs @ 12.40 hrs, Volume= 0.008 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 41.22' Storage= 3,441 cf
Plug-Flow detention time= 111.7 min calculated for 0.201 af (98% of inflow)
Storage and wetted areas determined by Prismatic sections

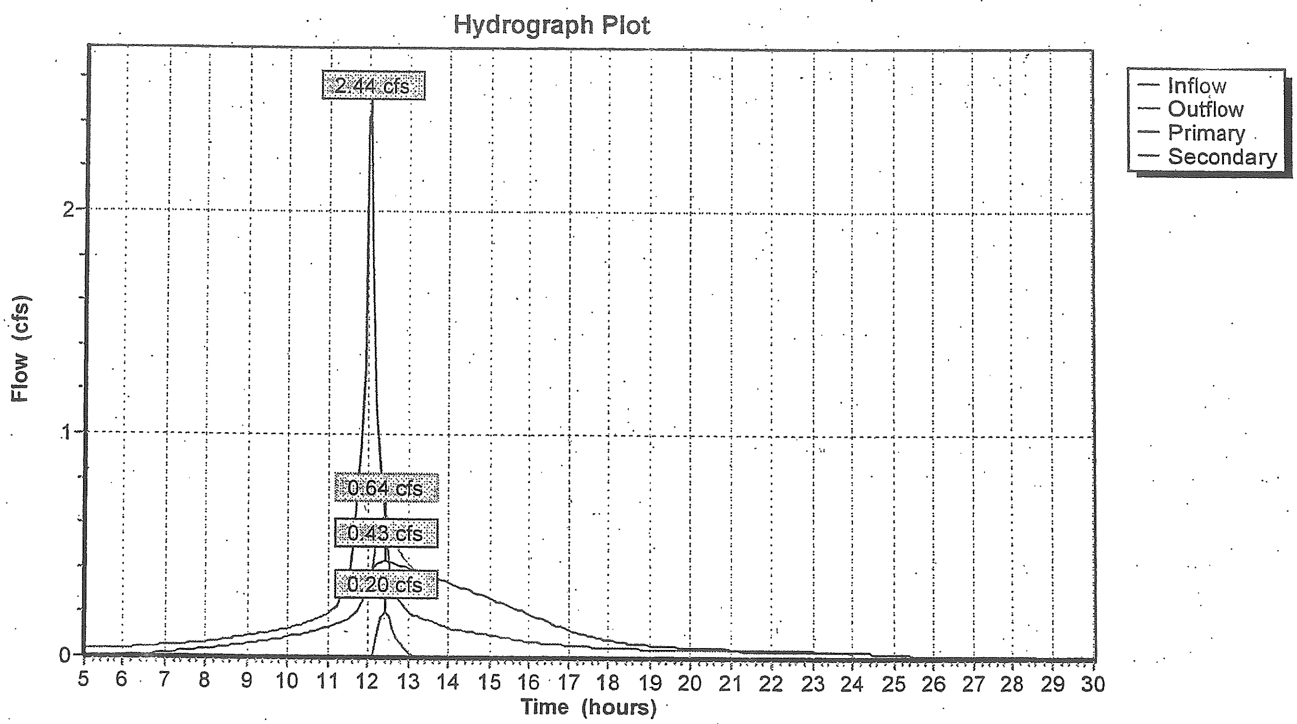
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
40.00	2,820	0	0
42.00	2,820	5,640	5,640

Primary OutFlow (Free Discharge)
↑—1=Culvert

Secondary OutFlow (Free Discharge)
↑—2=Culvert

#	Routing	Invert	Outlet Devices
1	Primary	40.00'	**4.0" x 10.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 39.50' S= 0.0500 '/' n= 0.011 Cc= 0.900
2	Secondary	41.00'	**12.0" x 10.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 39.50' S= 0.1500 '/' n= 0.011 Cc= 0.900

Pond P23: Pond 23



Pond P24: Dry Swale

Inflow =	2.48 cfs @ 12.03 hrs,	Volume=	0.227 af
Outflow =	2.41 cfs @ 12.08 hrs,	Volume=	0.214 af, Atten= 3%, Lag= 2.6 min
Primary =	0.02 cfs @ 12.08 hrs,	Volume=	0.032 af
Secondary =	2.39 cfs @ 12.08 hrs,	Volume=	0.183 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.10 hrs

Peak Elev= 35.77' Storage= 1,161 cf
Plug-Flow detention time= 88.3 min calculated for 0.214 af (94% of inflow)
Storage and wetted areas determined by Prismatic sections

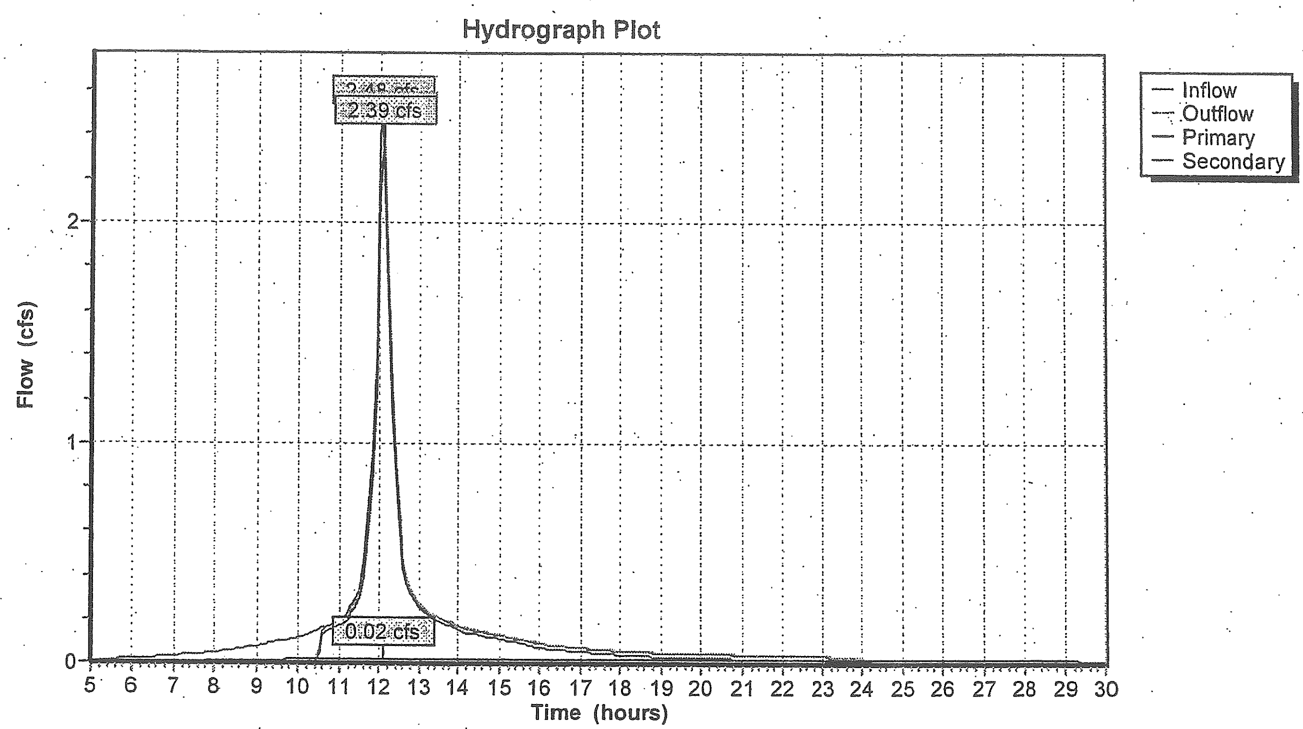
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.00	329	0	0
35.00	681	505	505
35.50	878	390	895
36.00	1,090	492	1,387

Primary OutFlow (Free Discharge)
↑—2=Culvert
↑—1=Exfiltration

Secondary OutFlow (Free Discharge)
↑—3=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Device 2	34.00'	**0.002000 fpm Exfiltration over Surface area above invert**
2	Primary	32.50'	**6.0" x 50.0' long Culvert** CMP, projecting, no headwall, Ke= 0.900 Outlet Invert= 32.00' S= 0.0100 '/' n= 0.010 Cc= 0.900
3	Secondary	35.50'	**7.0' long x 6.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4 Coef. (English) 2.38 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.6

Pond P24: Dry Swale



IV - A - c

Kenneth Volock

From: Tim Boyce [tboyce@swcole.com]
Sent: Wednesday, February 08, 2006 4:45 PM
To: Kenneth Volock
Cc: Chuck Lyman
Subject: FW: W&C Offices Expansion - bio-retetion swales

CT_CF_Drop_3.txt
(479 B)

Kenny,

Just spoke with Chuck Lyman, I think you met him on-site. He indicated conditions look like water becomes perched within forest duff and topsoil horizon on top of native clays between 1 to 1.5 feet below the ground surface and below this depth the clay is hard and unsaturated. This agrees with test borings elsewhere on the site where hard unsaturated clays were encountered to depths of at least 5 feet. In our opinion, perched water conditions like this are discrete and not representative of regional groundwater table. My sense is that your proposed bio-retention swales will have hard clay bottoms and sides, and that an underdrain in sand drainage blanket will be needed to relieve runoff water direct into these bio-retention swales. Without sand drainage blanket and underdrain outlet, bio-retention swales would fill with runoff water, not groundwater, which could adversely saturate root zone of plantings. We'll prepare logs and send over with plan showing approximate test pit locations. Trust this meets your needs.

S/ Tim

______

From: Tim Boyce [mailto:tboyce@swcole.com]
Sent: Wednesday, February 08, 2006 3:05 PM
To: Kenneth Volock (kvolock@woodardcurran.com)
Subject: SWCOLE @ your door 2-8-06

Kenny,

3pm Wednesday 2-8-06. Have wetland scientist at your front desk looking to hook up with you for test pits we discussed today. He's been unable to reach you, so I faxed him a plan showing the 3 test pit locations we discussed. Asked him to dig to 3.5 feet depth. I'll have him prepare logs and send to me, then catch up with you.

S/ Tim

Timothy J. Boyce, P.E.
Senior Geotechnical Engineer

S. W. Cole Engineering, Inc.
286 Portland Rd
Gray, ME 04039
Tel (207) 657-2866
Fax (207) 657-2840
www.swcole.com

IV-A-d

NOTICE OF INTENT TO COMPLY WITH MAINE CONSTRUCTION GENERAL PERMIT

PLEASE TYPE OR PRINT IN *BLACK INK ONLY*

Name of Co-Applicant (Owner):	CADCAM Associates, Inc.	Applicant Mailing Address:	41 Hutchins Drive		
Town/City:	Portland	State:	Maine	Zip Code:	04102
Daytime phone: (with area code)	(207) 774-2112	Email if available:	kvolock @woodardcurran.com	Name of Agent:	Kenneth Volock
Name of Co-Applicant (Owner):	Peggy and Eric Cianchette	Applicant Mailing Address:	c/o ELC, Inc., 42 Market Street		
Town/City:	Portland	State:	Maine	Zip Code:	04101
Project Location: (Town/City):	Portland	UTM Northing: (if known)	NAD 83, Z19 (meters) 4,834,126.519	UTM Easting: (if known)	NAD 83, Z19 (meters) 392,138.716
Map #:	238A 239	Lot #:	A001 A004	Size of disturbed area proposed:	2.24 Acres
Creating a common plan of development or sale?	~~Yes~~	NO	Part of a larger project?	~~Yes~~	NO
Name of waterbody(ies) to which the disturbed area drains, or name municipality if drains to an MS4:	Unnamed brook				
Does site drain to an Impaired Waterbody (C)? If so, give name:	No				
Detailed directions to site, including address if available:	From Portland, take Congress Street west to Hutchins Drive. Turn right onto Hutchins Drive and 41 Hutchins Drive is approximately 0.1 miles down Hutchins Drive on the right.				
Description of project and its purpose:	The proposed project involves the construction of a three-story addition to				

the office building currently located at the site, an expansion of the existing northerly parking lot, and associated utility improvements.

The purpose of the project is to allow continued growth of Woodard & Curran, the engineering company that has occupied the site for

20 years.

I am filing notice of my intent to carry out work which meets the requirements of the Construction General Permit (effective 3/10/03). I have a copy of the Construction General Permit. I have read and will comply with all of the standards. I have attached all the required submittals. *Notification forms cannot be accepted without the necessary attachments.*

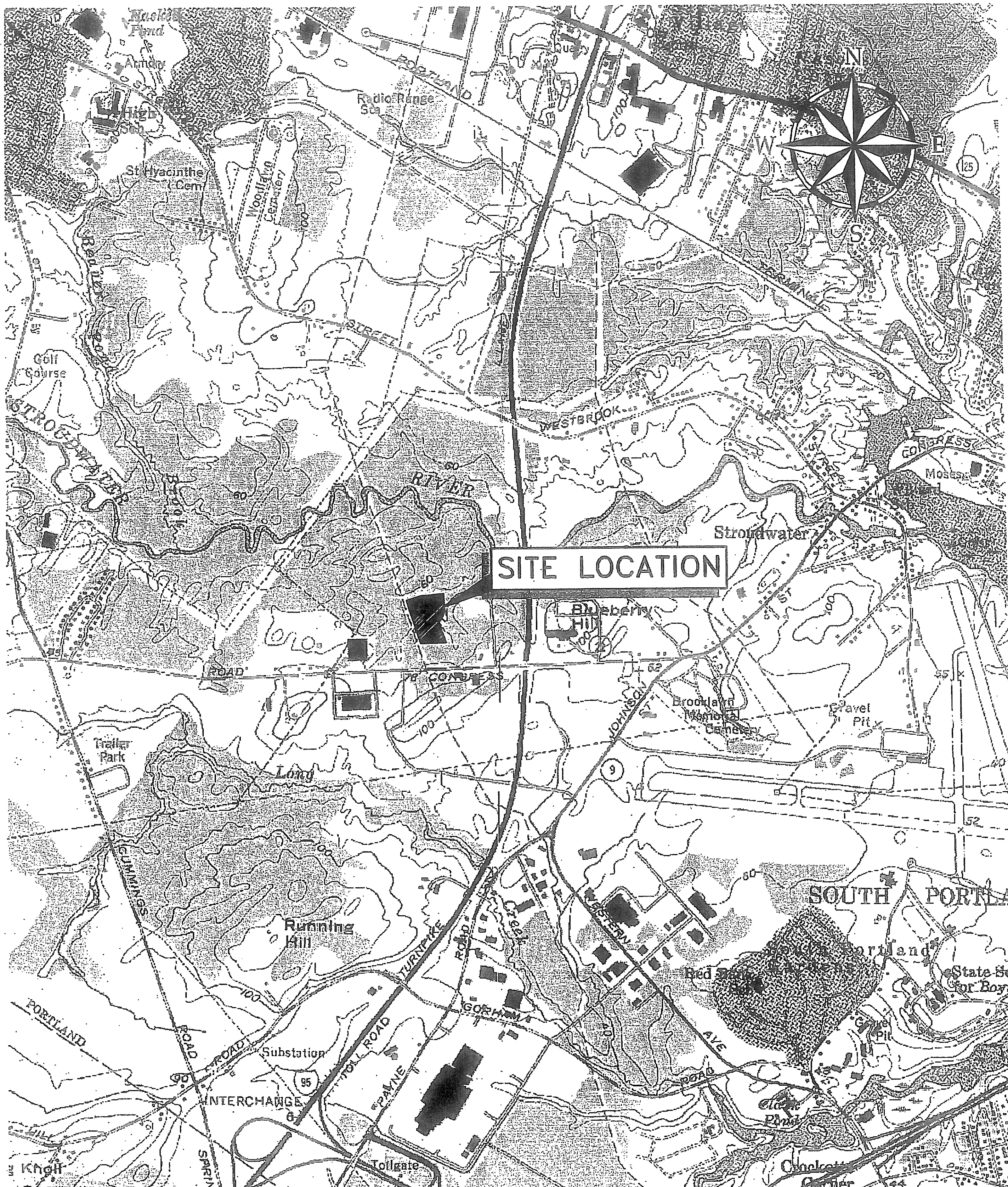
- ☑ ALL: A check for $100 (non-refundable) made payable to: "Treasurer, State of Maine" if ESC plan is attached for review. Otherwise, check for $75.
- ☑ ALL: A U.S.G.S. topo map or Maine Atlas & Gazetteer map with the project site clearly marked.
- ☑ ALL: Drawing of the proposed activity (site plan)
- ☐ IF this form is not being signed by the landowner or lessee of the property, attach documentation showing authorization to sign.
- ☐ IF disturbed area drains to an Impaired Waterbody (C), attach an ESC plan.
- ☐ IF disturbed area drains to any other waterbody and is 3 or more acres, EITHER (1) attach an ESC plan OR (2) include a statement (letter) that an ESC plan has been certified and by whom, from the person who certified the plan.
- ☐ IF any construction activity will occur in essential habitat, attach written approval from the Dept. of Inland Fisheries & Wildlife.

I authorize staff of the Departments of Environmental Protection to access the project site for the purpose of determining compliance with the general permit. I also understand that ***this permit is not valid until approved by the Department or 14 days after receipt by the Department, whichever is less.***

Signature of Applicant:	[signature]	Date:	2/23/2006

Keep the bottom copy as a record of permit. Send the form with attachments via certified mail to the Maine Dept. of Environmental Protection at the **appropriate regional office.** The DEP will send a copy to the Town Office as evidence of the DEP's receipt of notification. No further authorization by DEP will be issued after receipt of notice. An approved NOI is valid until 7/1/06. **Work carried out in violation of any standard is subject to enforcement action.**

OFFICE USE ONLY		Ck.#				Staff		Staff			
NOI #		FP		Date		Acc. Date		Def. Date		After Photos	



NOTE:

TOPO QUADS OBTAINED FROM MAINE OFFICE OF GEOGRAPHIC INFORMATION SYSTEMS.

2000' 0 2000' 4000'

WOODARD & CURRAN Engineering · Science · Operations PORTLAND, MAINE 800-426-4262	USGS TOPOGRAPHIC MAP DESIGNED BY: JBC — CHECKED BY: ESS DRAWN BY: JBC — 20383401-U001.1.dwg	CAD–CAM ASSOCIATES PORTLAND, MAINE WOODARD & CURRAN INC. OFFICE EXPANSION 41 HUTCHINS DRIVE, PORTLAND, ME	JOB NO: 203834.03 DATE: SEPTEMBER 2005 SCALE: 1" = 2000' Figure 1.1

IU - A - e

EROSION AND SEDIMENTATION CONTROL: WOODARD & CURRAN OFFICE EXPANSION

1 PURPOSE

The overall goal of the erosion and sedimentation control plan is to restrict the potential for erosion on the site and the subsequent transfer of sediment to off-site areas and protected resources. Construction of the proposed project has the potential to disturb approximately 2.2 acres of soil, one quarter of which is currently paved areas. This section defines the permanent and temporary measures that will be employed to minimize erosion and sediment removal.

2 OVERVIEW

The construction of the Woodard & Curran Office Expansion will take approximately one year. This document describes the temporary erosion and sedimentation control measures that will be used during construction, and the long-term measures and maintenance procedures that will be used to prevent erosion and sediment removal after construction is complete and the facilities are in use.

3 PROTECTED NATURAL RESOURCE

The protected natural resource associated with the project is the unnamed brook that flows through the middle of the site and into the Stroudwater River. The Stroudwater River is not a water body most at risk from development.

No threatened or endangered species habitat are known to exist at the site; and there are no existing erosion problems.

4 PERMANENT MEASURES

The entire site will be stabilized when the project is complete. Approximately half of the site will be covered with buildings or paved impervious area; the remainder will be graded and landscaped or otherwise revegetated. All swales and slopes will be grassed; further, filtration basin and dry swale spillways, which can be expected to experience higher runoff velocities, will be constructed with soil reinforcement blankets. Pipe outlets will be protected with rip rap aprons or plunge pools. Permanent erosion and sedimentation control measures are indicated on the design Drawings.

The site will be regularly inspected to ensure that surfaces are in good repair and no erosion is occurring. If any area of surface material is damaged and erosion exists, repairs to the surface material will be made immediately to prevent further erosion. After repairs are made, the reason for the damage will be determined and corrected.

The site will be maintained by the property owner. Maintenance will include keeping landscaped areas and stormwater runoff treatment measures functioning as designed, and sweeping paved areas. Storm drain field inlets installed on-site will also be maintained by the property owner.

5 TEMPORARY MEASURES DURING CONSTRUCTION

The area of disturbed soil exposed at any given time during construction will be minimized. The grades are varying and in some cases will change significantly as a result of the project. Erosion and sedimentation control for the site during construction will include the following elements, the locations of which are shown in the design Drawings on Sheet C200 Erosion and Sedimentation Control Plan.

Erosion and sedimentation control details and general notes are included in the design Drawings on Sheet C303 Civil Details - 4.

- Facilities to filter stormwater and trap sediment down-slope from stockpiled materials and construction areas will be installed. With careful attention to housekeeping, especially sweeping operations, it may not be essential that sediment filtering measures be installed. Critical installation locations down-slope from areas that will be disturbed are shown on Sheet C200 Erosion and Sedimentation Control Plan. As previously mentioned, additional locations where sediment barriers must be installed to prevent sediment from leaving the site may be identified by the Owner and Contractor during their regular inspections of the construction site. It will be the Contractor's responsibility to provide and install filter barriers.

  Due to the varying slopes on the site, as well as its proximity to stream and wetland areas, sediment berms will be used in conjunction with siltation fencing to prevent sediment from the site. Details for the sediment berms and siltation fencing are shown on Sheet C303 Civil Details - 4.

  All sediment barriers require frequent inspection and maintenance to be effective. Should the barrier become ineffective, as evidenced by observance of sediment escaping underneath it, immediate repairs must be made and it must be re-shaped, relocated, or replaced, as needed. Sediment must be removed when deposits reach half the height of the barrier. Removed sediment must be disposed of in an approved manner.

  Sediment barriers will be removed when construction of the project is complete. A portion of a sediment barrier may be removed when all areas up-slope from that portion have been permanently stabilized.

- A construction entrance to prevent sediment from leaving the site on construction vehicles will be installed. Locations for the entrances are shown on Sheet C200 Erosion and Sedimentation Control Plan. A construction entrance detail is included on Sheet C303 Civil Details - 4. The location of this entrance will be determined by the Contractor based on both where construction activities are occurring and the expected traffic patterns on and off the site. It is possible that construction entrances could be used in more than one place either at the same time or at different times depending on the construction schedule.

  The construction entrance will be removed just prior to installing the final surface stabilization to that area of the site.

- Inlet protection will be installed at all catch basin inlets down-slope from disturbed soils areas to prevent sediment from entering the storm drain system. New catch basins will require sedimentation protection as soon as they are installed. Catch basin inlet protection details are shown on Sheet C303 Civil Details - 4. In lieu of the straw bale barrier indicated, the Contractor may choose to employ Siltsack, by ACF Environmental, or other manufacturer's catch basin inlet protection products. Should a manufactured filtering product be used, the Contractor will comply with all manufacturer instructions for installation, maintenance and removal.

  The materials used to provide catch basin protection will be removed when upslope areas are permanently stabilized. Because existing and proposed catch basins will be located at low points on the site, removal of their sediment control protection will be one of the last erosion and sedimentation control measures removed.

- Water removed from excavation dewatering operations will be filtered in a filter fabric bladder such as the Dirtbag, or a filter fabric covered plastic fence, such as FiltR Fence, enclosure. The method of filtering the excavation dewatering water will be designed to meet the expected dewatering flow rate, the fabric strength and permeability.

Sediment captured in the dewatering filter measures will be removed at the interval recommended by the manufacturer of the product utilized. Filtered water will be discharged to a stabilized area and will ultimately flow to the storm drain system.

6 SCHEDULING

Scheduling of specific construction activities, including installation of erosion and sedimentation control measures, will be used to minimize both the amount of soil exposed at the site at any given time and the sediment transfer.

The following erosion and sedimentation control measures will be installed prior to commencing earthwork activities:

- Construction entrance,
- Sediment berms and siltation fencing, and
- Catch basin inlet protection.

Proposed stormwater management structures will be installed and put into operation as soon as practical at the beginning of construction. If stormwater runoff from any work area will flow directly into the wetland or brook, a sediment barrier must be installed down-slope of the work area prior to commencement of any excavation in that work area. Inlets to the new storm drain structures must be provided with sediment protection. Installing and using permanent erosion and sedimentation control mechanisms as soon as practicable will minimize the number of temporary sediment barriers.

The primary erosion and sedimentation control measures, such as the construction entrance and the sediment berms and siltation fencing, will be installed prior to winter construction. All vegetated disturbed areas will be seeded, winter mulched or both.

7 MAINTENANCE DURING CONSTRUCTION

The Contractor will be required to perform regular maintenance at the site. Regular inspections of the site and erosion and sedimentation control facilities will be made by a representative of the Owner and the Contractor. Inspections will be made daily. Repairs will be made in a timely manner. At a minimum, the inspections will include the items listed in Table 1 below.

Table 1: Erosion & Sedimentation Control Inspection and Maintenance

INSPECTED ITEM	LOOK FOR
Mulched Surfaces	• Thin mulch or inadequate application • Wind movement
Seeded Surfaces	• Poor seed germination • Loss of mulch
Sediment Barrier	• Sediment build-up to one half the height of the barrier • Undermining of the barrier • Supporting stakes loose, toppled, or unmarked • Breaks in barrier
Inlet Protection	• Sediment build-up and structure blockages • Breaks in fabric or voids in barrier
Construction Entrance	• Sedimentation of roadways

A log of inspections made and corrective actions taken will be kept on the attached form, or a similar one prepared by the Contractor and approved by the Engineer. The logs shall be maintained by the Owner and the Contractor for a minimum of three years.

STORMWATER EROSION & SEDIMENTATION CONTROL INSPECTION REPORT FORM

Inspectors:

Date: ___ / ___ / _____
Time: ________ a.m./p.m.
Temperature: _______ °F

______________________________ of ______________________________ (Project Owner)
______________________________ of ______________________________ (Contractor)
______________________________ of ______________________________
______________________________ of ______________________________

Storm Event? ☐ Yes ☐ No Rainfall Amount _______ Storm Duration _______ hours

Visual Observations of Activity and Site Conditions:

Disturbed Soil Areas: ______________________________

Storage Of Soils: ______________________________

Sediment & Erosion Control Measures: ______________________________

Construction Site Entrance: ______________________________

Surface Stabilization: ______________________________

Corrective Actions Taken:

Attachments (if any):

Signature:

Representing:

Representing:

10 - A- f.

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February 21, 2006

Mr. Tom Errico, PE
Wilbur Smith Associates
59 Middle Street
Portland, ME 04101-4211

COPY

Re: Proposed Expansion of Woodard and Curran
Additional Analysis

Dear Tom:

As per your request, our office has completed turning movement counts at the intersection of Congress Street and Hutchins Drive and completed capacity analysis at these locations. Based on the analysis, additional traffic due to the expansion of Woodard and Curran will not have a significant impact on operations at this location.

Predevelopment Traffic Volumes

Our office completed turning movement counts at the intersection of Hutchins Drive and Congress Street on February 13, 2006. The volumes were seasonally adjusted utilizing the MaineDOT standard adjustment factors for Group I roadways. Other development volumes from the Dunkin' Donuts and Cinemagic projects under construction to the east of this intersection were combined with the adjusted volumes to yield the predevelopment volumes.

Trip Generation and Assignment

As previously discussed, Woodard and Curran's expansion efforts since 1997 as well as the proposed expansion are forecast to generate an additional 75 and 87 trip ends during and AM and PM peak hours, respectively. However, for the purposes of analysis, the proposed addition of 64 employees to the current workforce was utilized to determine net additional trip generation. Based on Land Use Code 715, Single Tenant Office Building, this expansion is forecast to generate 49 and 61 trip ends during the AM and PM peak hours, respectively.

This project is anticipated to generate all primary, or new trips to the study area. These trips were assigned to the intersection of Hutchins Drive and Congress Street based on existing vehicle movements to and from Hutchins Drive. The trip assignment was combined with the predevelopment volumes to result in the postdevelopment traffic.

It should be noted that the raw, adjusted, predevelopment, trip assignment, and postdevelopment traffic figured are enclosed with this letter.

Capacity Analyses

Our office completed analysis for the predevelopment and postdevelopment conditions utilizing the Synchro software package. The results are summarized in the following table:

Level of Service for Congress Street at Hutchins Drive

Lane Group	AM Peak Hour				PM Peak Hour			
	Predevelopment		Postdevelopment		Predevelopment		Postdevelopment	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Congress EB LT	19	B	20	C	37	D	38	D
Congress EB TH	41	D	41	D	38	D	39	D
Congress EB RT	1	A	1	A	11	B	13	B
Congress EB LT	16	B	16	B	28	C	29	C
Congress WB TH/RT	19	B	19	B	41	D	44	D
Exit 46 Connector NB LT	41	D	41	D	38	D	45	D
Exit 46 Connector NB TH/RT	15	B	17	C	11	B	11	B
Hutchins SB LT/TH	52	D	54	D	47	D	54	D
Hutchins SB RT	17	B	17	B	11	B	14	B
Overall	28	C	28	C	31	C	34	C

As can be seen from the above table, all lane groups operate at a level of service 'D' or better for all scenarios. A copy of the Synchro printouts is enclosed with this letter.

Crash Data

Our office obtained the 2002-2004 crash history of Route 22 (Congress Street/County Road) from Johnson Road to County Road. Based on the information, no location along this portion was classified as an HCL. A copy of the crash history is enclosed with this letter.

Please contact me should you have any further questions regarding this project.

Sincerely,

Gorrill-Palmer Consulting Engineers, Inc.

Thomas L. Gorrill, P.E., PTOE
President

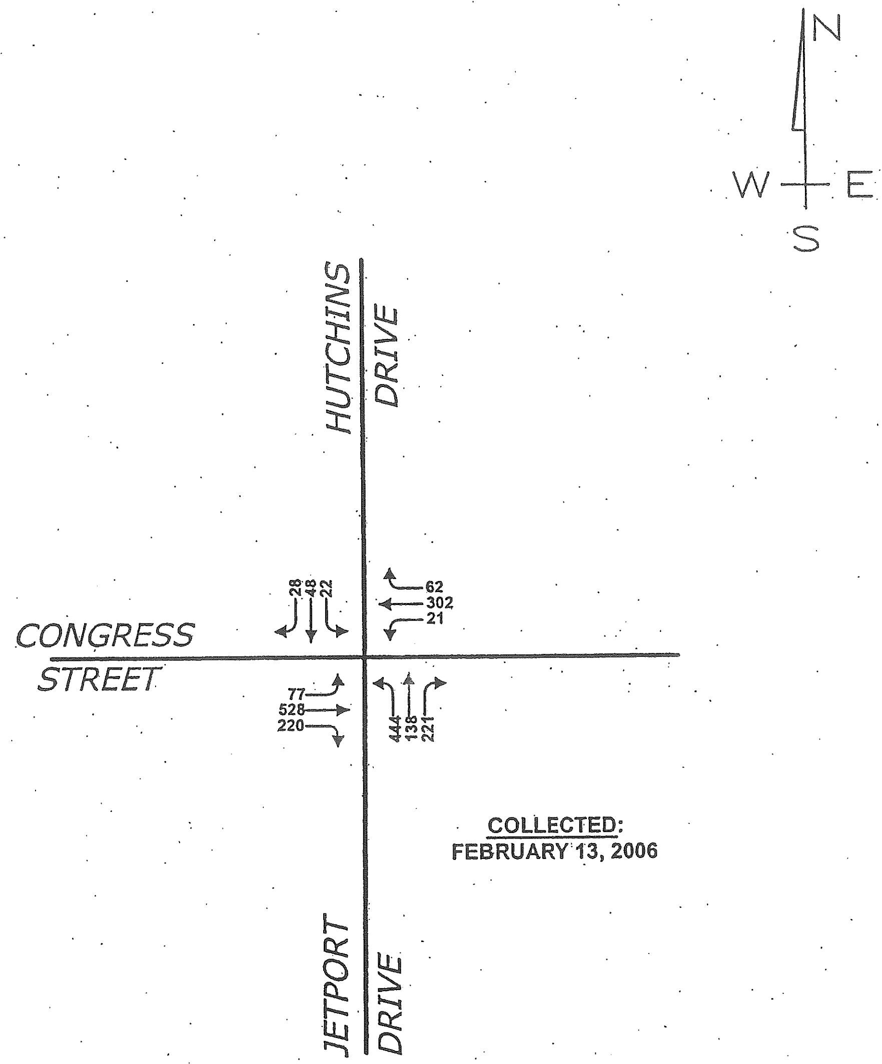
Enclosure

Copy: Barry Sheff, Woodard and Curran

TLG/jjb/JN1495/Errico2-17-06.doc

Raw Volumes - AM Peak Hour

Figure No. 1



COLLECTED:
FEBRUARY 13, 2006

AM PEAK HOUR:
7:30 - 8:30 AM

PROPOSED EXPANSION - WOODARD AND CURRAN, PORTLAND, MAINE

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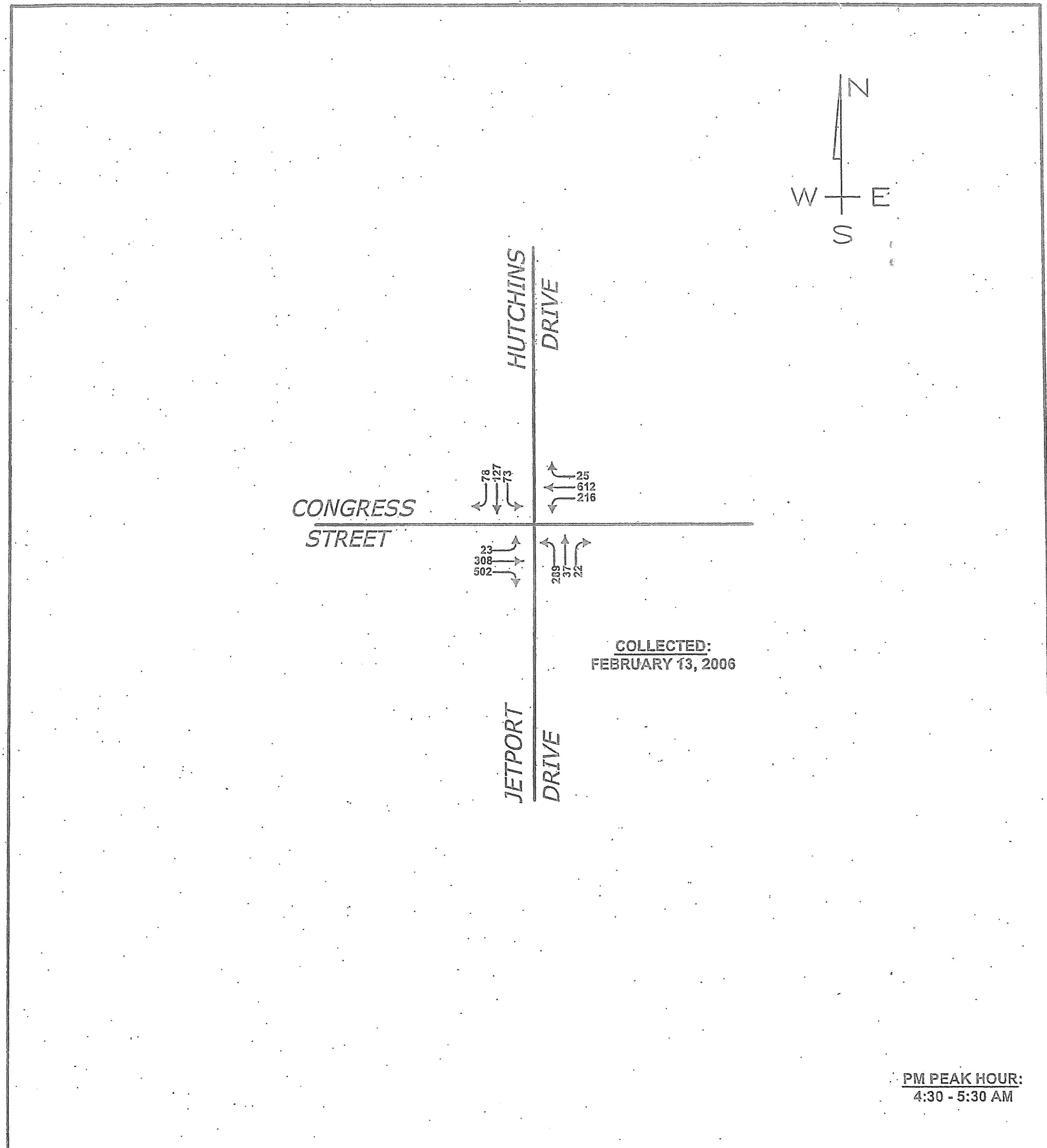
Raw Volumes - PM Peak Hour

Figure No. 2



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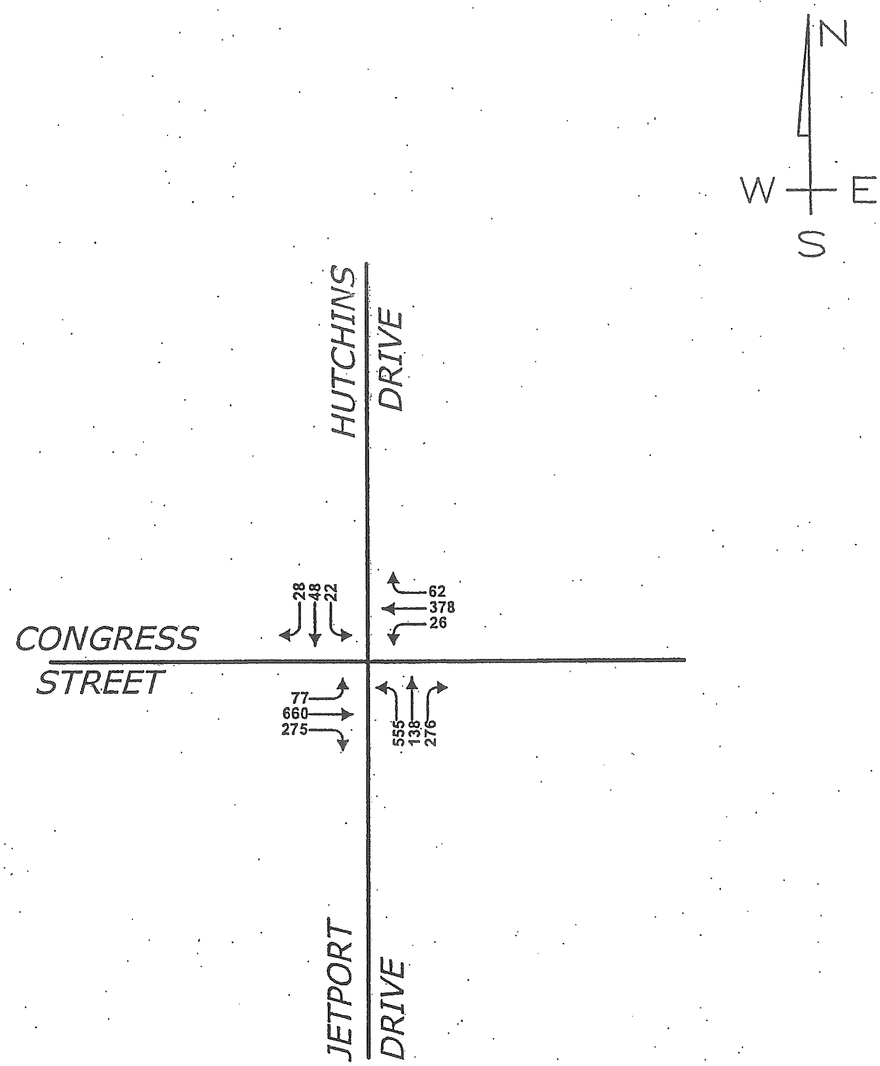
Seasonally Adjusted Volumes - AM Peak Hour

Figure No. 3



CONGRESS WITH OUT BLUEBERRY
TYPE I

SEASONAL ADJUSTMENT: $\frac{1.09}{0.87} = 1.25$

AM PEAK HOUR:
7:30 - 8:30 AM

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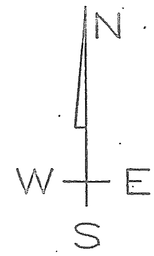
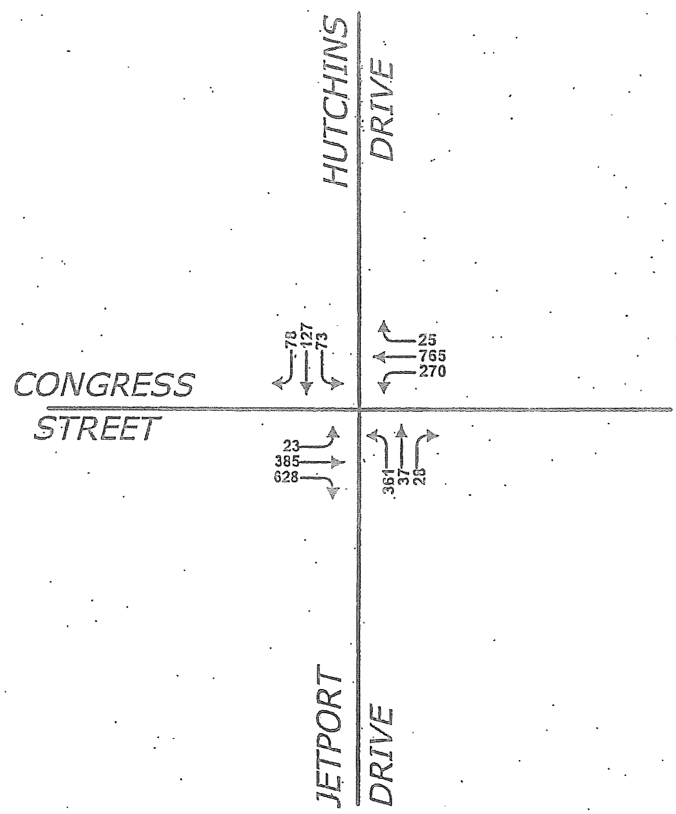
Seasonally Adjusted Volumes - PM Peak Hour

Figure No. 4





CONGRESS WITH OUT BLUEBERRY
TYPE I

SEASONAL ADJUSTMENT: $\frac{1.09}{0.87} = 1.25$

PM PEAK HOUR:
4:30 - 5:30 PM

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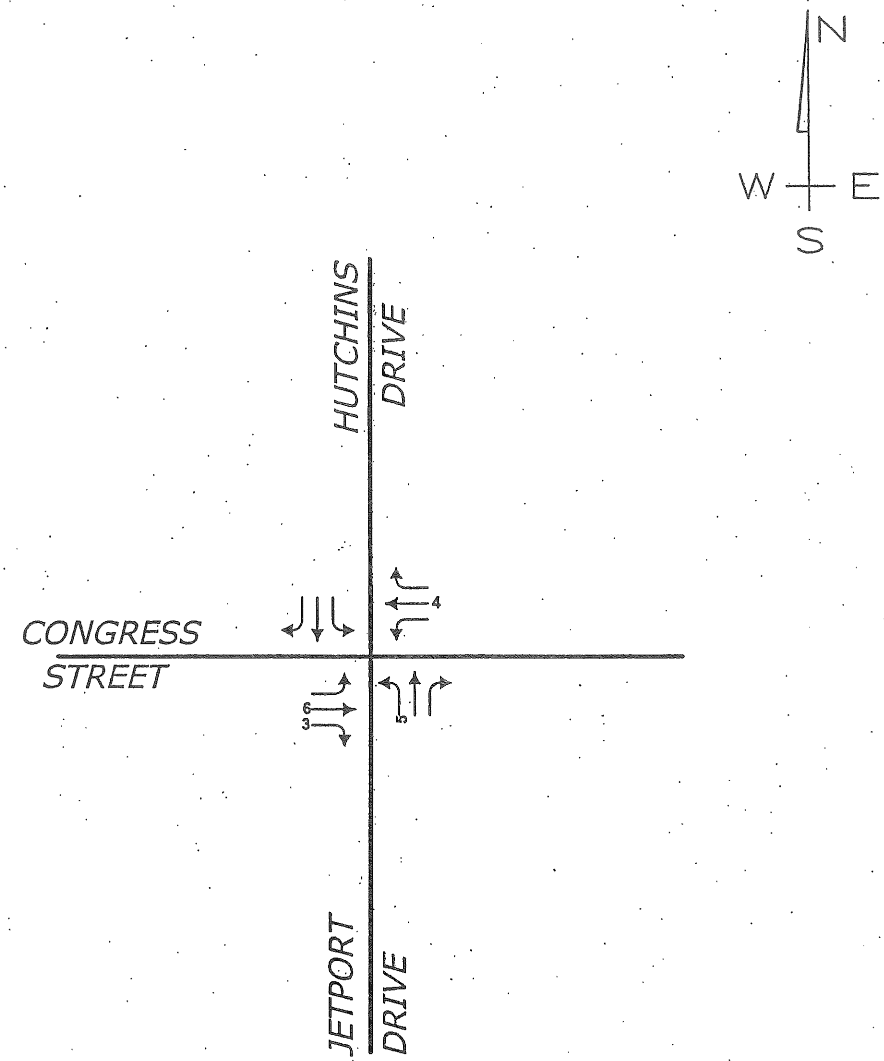
Other Development - AM Peak Hour

Figure No. 5



OTHER DEVELOPMENT INCLUDES:
DUNKIN DONUTS: XX

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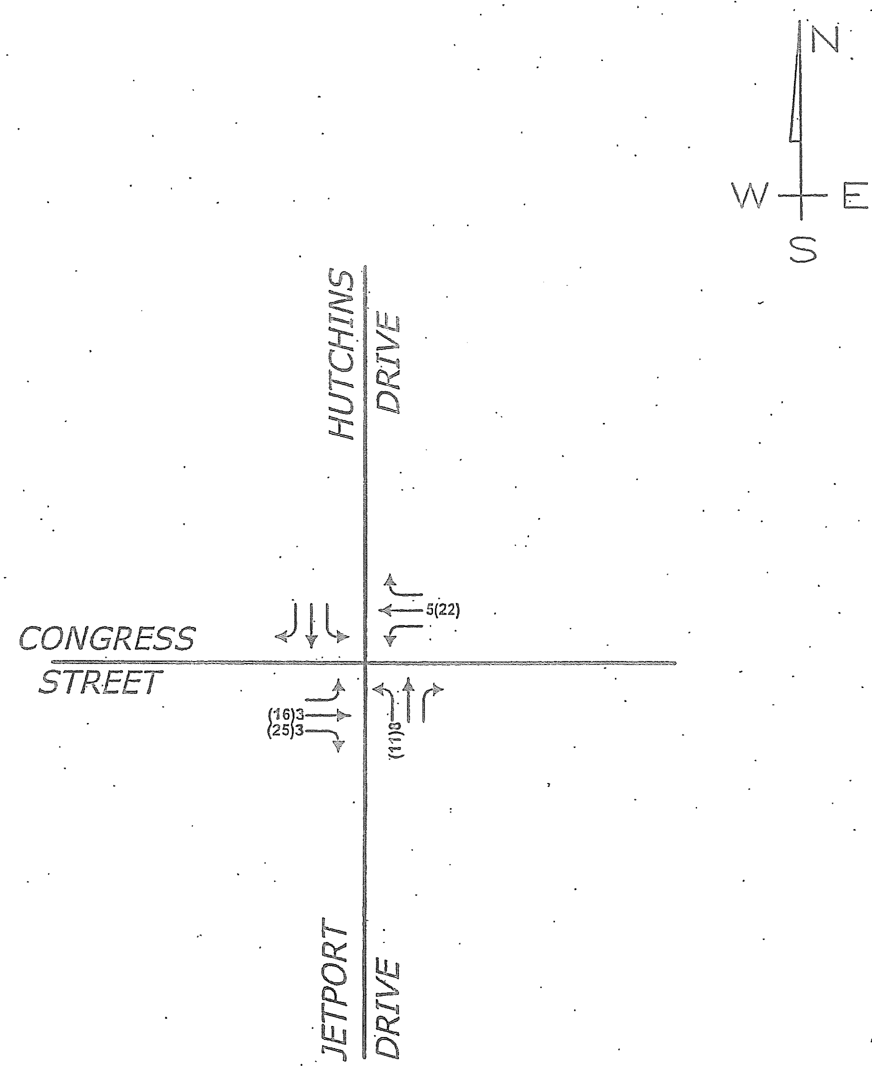
Other Development - PM Peak Hour

Figure No. 6



OTHER DEVELOPMENT INCLUDES:
DUNKIN DONUTS: XX
CINEMAGIC: (XX)

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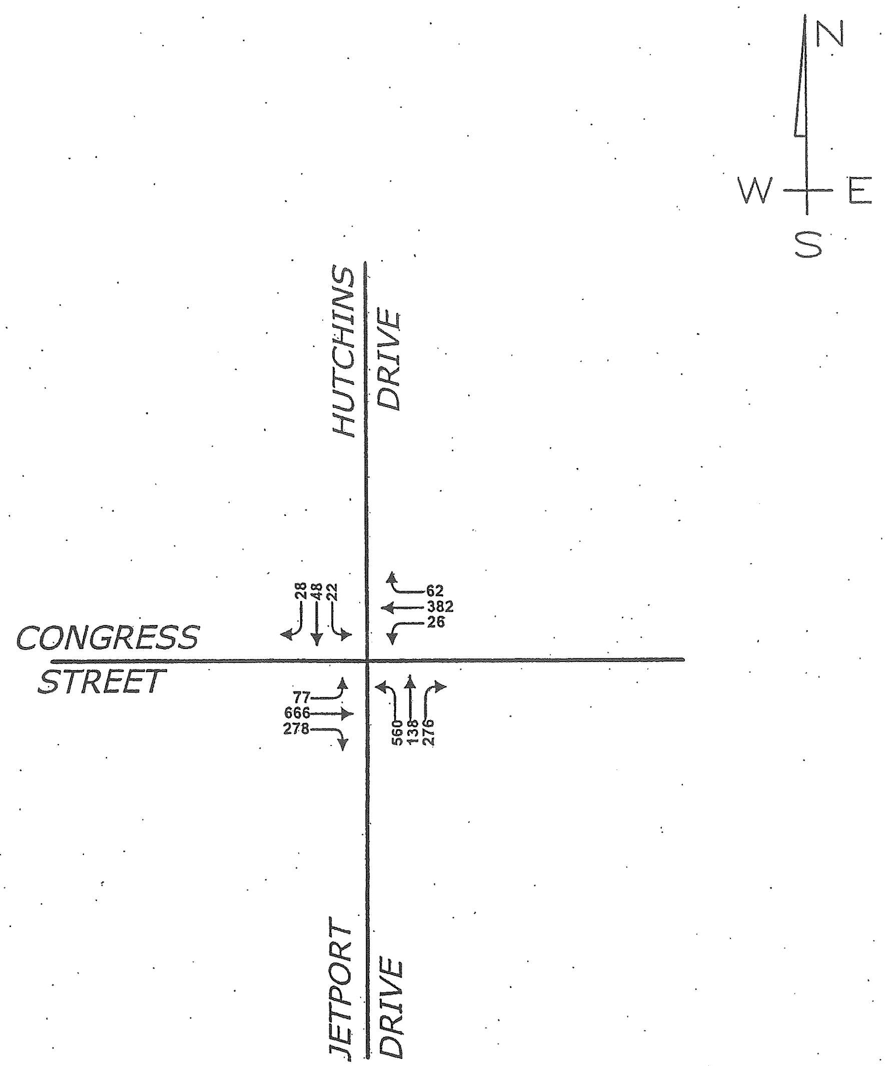
2006 Predevelopment - AM Peak Hour

Figure No. 7



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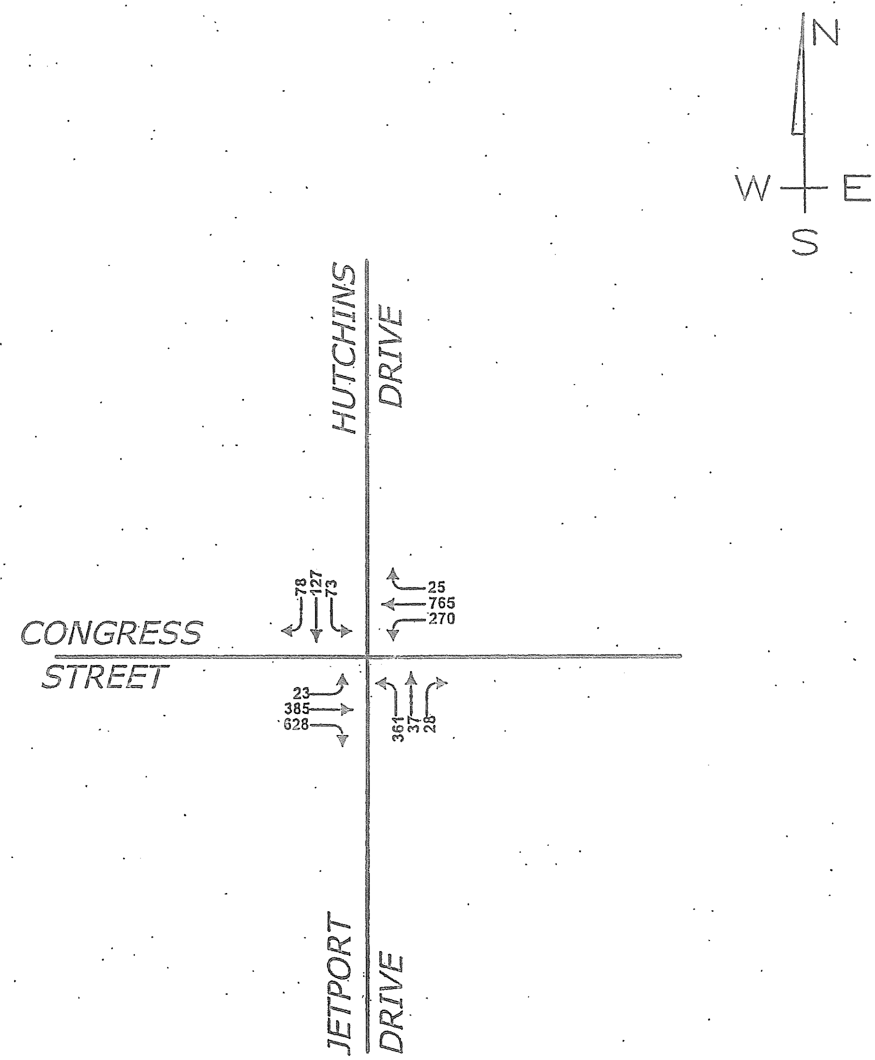
2006 Predevelopment - PM Peak Hour

Figure No. 8



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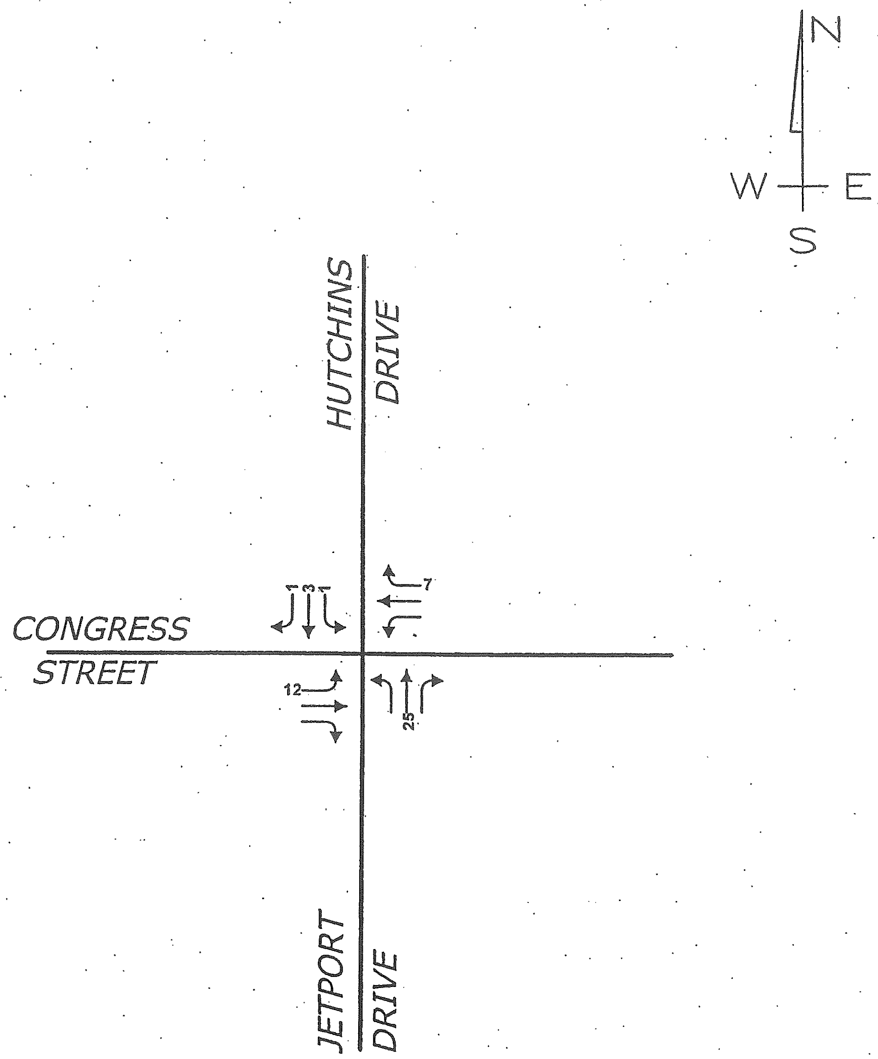
Trip Assignment - AM Peak Hour

Figure No. 9



44	ENTER
5	EXIT
49	TOTAL

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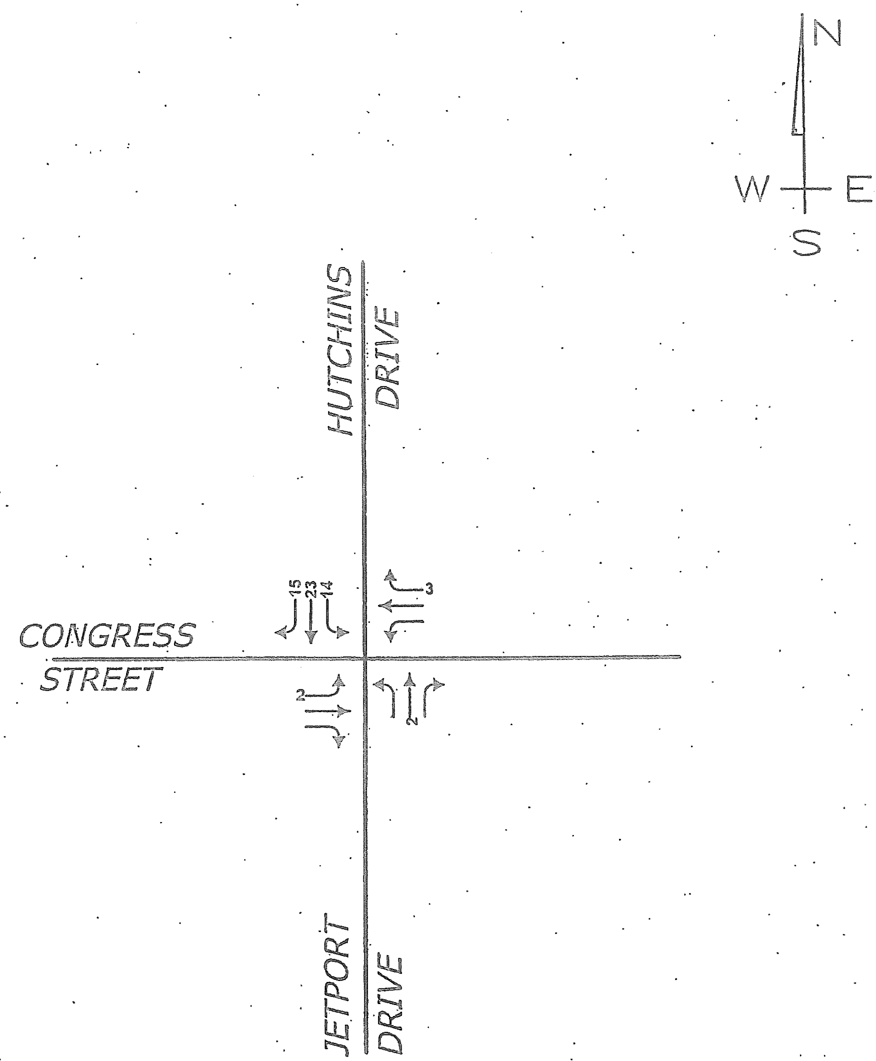
Trip Assignment - PM Peak Hour

Figure No. 10



9	ENTER
52	EXIT
61	TOTAL

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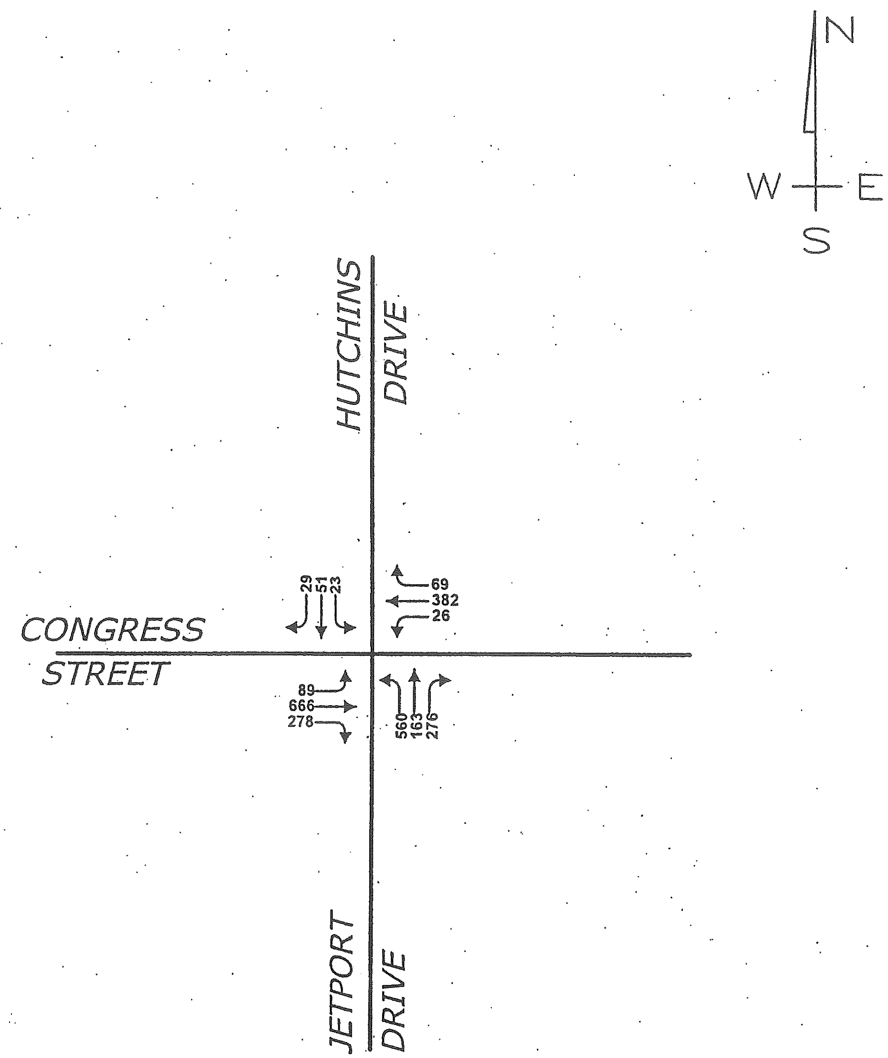
2006 Postdevelopment - AM Peak Hour

Figure No. 11



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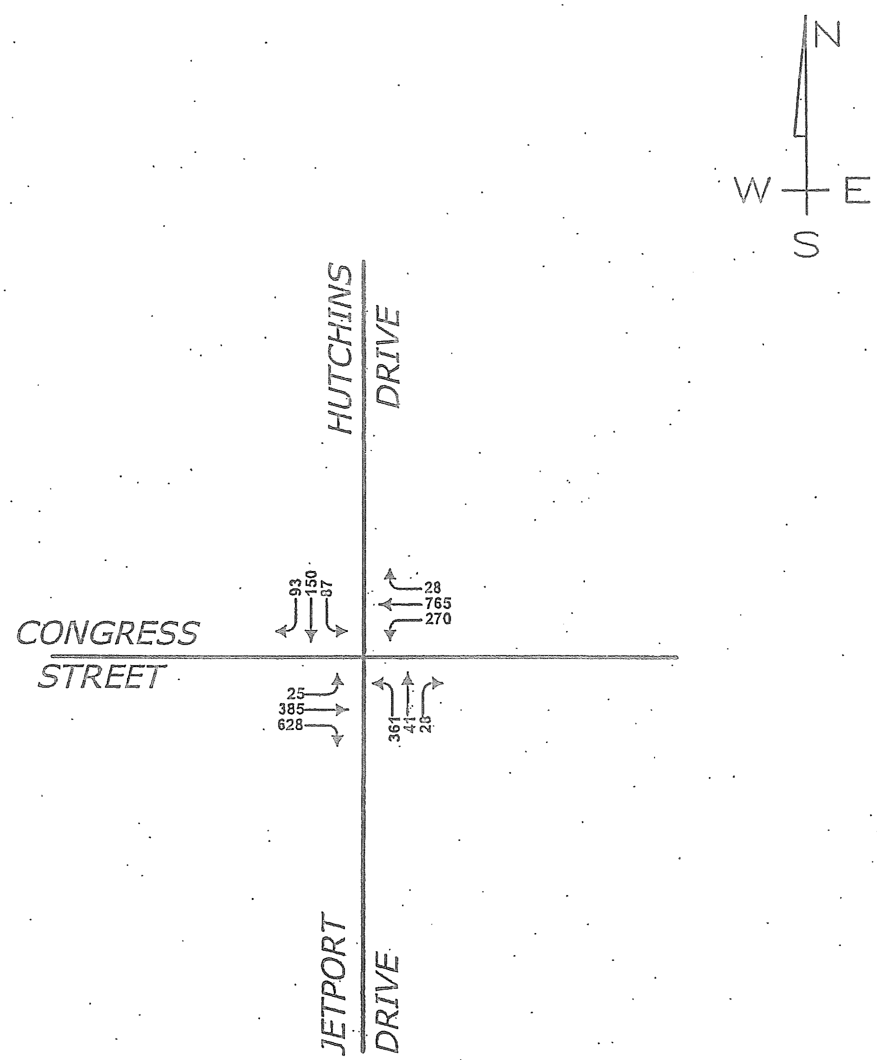
2006 Postdevelopment - PM Peak Hour

Figure No. 12



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