CITY OF DOVER

PLANNING TECHNICAL REVIEW COMMITTEE –AGENDA

Meeting Type: Regular Meeting
Meeting Location: 2nd Floor Conference Room – City Hall, Dover NH
Meeting Date: **Thursday, August 9, 2018**
Meeting Time: **10:30 am**

1. 10:30 AM – 11:15 AM: Site Review for Marker 44 Holdings, LLC, Assessor's Map 24, Lots 114 & 115-B, zoned CBD-G & CWD, located at 87 Portland Ave. & Cocheco St. (Proposal is to leave the existing 2,176 sq. ft. two family dwelling and construct four 3,904 sq. ft. multi-unit apartment buildings containing a total of 32 units and construction of a 24 ft. wide driveway to access both buildings). A request for a CUP and Lot Line Adjustment will also appear before the Planning Board. (P18-34)

CIVILWORKS NEW ENGLAND
181 WATSON ROAD
P.O. BOX 1166
DOVER, NH 03821-1166
PHONE: 603.749.0443 FAX: 603.749.7348

July 23, 2018

Mr. Christopher Parker
Assistant City Manager/Director of Planning
City of Dover
288 Central Ave
Dover, NH 03820

Subject: Cocheco Landing: A Residential Apartment Development
87 Portland Ave & Cocheco Street
Dover, NH 03820
Our Reference No. 1795

Re: Site Review Application &
Conditional use Permit &
Lot Line Adjustment Application Submission

Dear Mr. Parker:

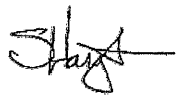
On Behalf of our clients, Marker 44 Holdings, LLC, we are pleased to submit (8) Copies of the Application(s), (8) sets of the application material, (1) set of the supporting drainage analysis, (8) full size plan sets, and one electronic copy of the attached materials for Planning Board, Technical Review Committee, and Conservation Commission consideration:

1) Site Review Application & Checklist;
2) Conditional Use Permit Application
3) Lot Line Adjustment Application
4) Tax Map
5) USGS Map
6) Current Deed Information
7) Project Narrative
8) Fiscal Impact Analysis
9) Traffic Impact Analysis
10) Utility Letters
11) Site Photographs
12) NHB Review
13) Wetland Report
14) Inspection and Maintenance Plan

15) Drainage Report & Plans (Select Sets)
16) Design Plans

We look forward to discussing this application further following review by City Staff and the appropriate Board. If you have any questions that we might be able to answer, please do not hesitate to contact our office.

Sincerely,



Stephen J Haight, PE

CIVILWORKS NEW ENGLAND

SJH

SITE REVIEW APPLICATION

City of Dover, New Hampshire
SITE REVIEW APPLICATION

[Revision Date: April 02, 2018]

Office Use Only	Project #:		Date Received:	
	Amount Paid:		Time Received:	

APPLICANT AND OWNER INFORMATION

Name of Applicant: Marker 44 Holdings, LLC Telephone # (603) 743-6649

Address of Applicant: 130 Central Ave, Dover, NH 03820

E-Mail Address: wfhopkins@hotmail.com

Name of Property Owner (*if different from applicant*): same Telephone # same

Address of Property Owner: same

PROPERTY INFORMATION

Address of Property: 87 Portland Ave & Cocheco St.

Assessor's Map # 24 Lot(s) # 114, 115-B

Zoning District(s) CBD-G, CWD Overlay District(s) Wetlands Protection District

Size of Parcel: 39,463 / 41,164 sq. ft. 0.91 / 0.94 ac. Property Deed: Book 4563 / 4562 Page: 175 / 656

Existing Use of Property: residential/unimproved

SITE PLAN INFORMATION

Describe Proposed Use: (4) New Multiunit Residences & (1) existing two family dwelling

Area of Parcel to be Developed: 1.85 AC sq. ft.

If Multi-family Residential, Specify Number of Units & Buildings Proposed: (4) New Buildings-32 Units / (1) Existing Buildings-2 Units

Number of Parking Spaces: Existing _____ Proposed 61

Highway Access (check where applicable): ____ City Street X State Highway

Number of Employees Total: n/a In Maximum Shift: n/a

Disposition of Parcel:

Building Footprint Proposed: 3904 sf (typ) sq. ft.

Total Building Area 17,792 sf (4 @ 3904 + 2176) sq. ft.

Paved Area _____ sq. ft.

Building Setbacks:

Front Yard 12.66' (Portland Ave) ft.

Rear Yard 53.78' (Lot 24/113) ft.

Side Yard: Right 27.69 ft. Left 8.45 ft.

City Water? x Yes ___ No How far is city water from the property? adjacent

City Sewer? x Yes ___ No How far is city sewer from the property? adjacent

BUILDING INFORMATION

Type of Building to be Built: multi-unit residential

Height of Building: Proposed Buildings < 55' Finished Floor Elevation: Proposed Buildings 62.5, 57.5, 47.0, 49.2 Existing 75.0

Number of Seats (where applicable) n/a

Estimated value of construction: _____ Refuse removal: Public/(Private) (circle one)

WAIVER REQUESTS

Site Review Regulations section(s) to be waived: see attached

Justification for waiver request(s) (*attach additional sheets as needed*): see attached

SURVEYOR INFORMATION

Name of Surveyor and Company (Licensed in N.H.) Kevin M. McEneaney P.L.S.

Address P.O. Box 681, 24 Chestnut Street, Dover, NH 03821 Telephone #: (603) 742-0911

Professional License #: 661 E-mail address: MSA@Surveynh.com

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) Stephen J. Haight, Civilworks NE

Address PO Box 1166, Dover, NH 03821 Telephone #: 603-749-0443

Professional License #: 7978 E-mail address: shaight@civilworksne.com

SIGNATURES

I/We hereby submit this application to the City of Dover Planning Board and attest that to the best of my knowledge all of the information on this application form and in the accompanying application materials and documentation is true and accurate. Furthermore, I/we submit that the existing conditions sheet of the plan represents the lot in question, and that no alteration of the site shall take place during Planning Board review up to and including the pre-construction meeting. As applicant or as agent, I attest that I am duly authorized to act in this capacity.

Signature of Property Owner: _____ Date: 7/27/18

Signature of Applicant (*if different from owner*): _____ Date: _____

Signature of Agent: _____ Date: 7/20/18

AUTHORIZATION TO ENTER SUBJECT PROPERTY

I, and my successors, hereby authorize members of the Dover Planning Board, Planning Department and other pertinent City Departments and boards to enter my property for the purpose of evaluating this application, including performing inspections during the application phase, post-approval phase, construction phase and occupancy phase. It is understood that these individuals must use all reasonable care, courtesy, and diligence when on the property.

Signature of Property Owner: _____ Date: 7/19/18

AUTHORIZATION TO COMPLETE THE PROJECT ON SUBJECT PROPERTY

I, and my successors, hereby the City of Dover or its assigns to enter my property for the purpose of completing the site work as required by the approved plan should the letter or credit or other surety be called. It is understood that these individuals must use all reasonable care, courtesy, and diligence when on the property.

Signature of Property Owner: _____ Date: 7/19/18

Signature of Applicant (*if different from owner*): _____ Date: _____

CERTIFICATION OF FEES

I, and my successors, hereby certify that I understand that the City of Dover collects impact fees, utility investment fees and inspection fees for projects developed in Dover. Said fees must be paid before a Certificate of Occupancy can be obtained for a structure, unless a different payment schedule is agreed to by the applicant and the City prior to approvals being issued by the Dover Planning Board. Additionally, should the property be in "Current Use" it will be subject to the Land Use Change Tax.

Signature of Property Owner: _____ Date: 7/19/18

Signature of Applicant (*if different from owner*): _____ Date: _____

CITY OF DOVER SITE REVIEW
LIST OF ABUTTERS

Pursuant to RSA 676:4, the State Law of New Hampshire, the City of Dover is required to notify the applicant, abutters (including holders of conservation easements), and any professional whose seal is on the plan, of the public hearing by certified mail, return receipt requested. Staff will provide the abutter information, while the applicant must provide accurate contact information for the owner, applicant and professional agents representing the project.

Owner:

TAX MAP	LOT #	PROPERTY OWNER	MAILING ADDRESS

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

Conditional Use Permit

City of Dover, New Hampshire
CONDITIONAL USE PERMIT APPLICATION

[Revision Date: May 16, 2013]

Office Use Only	Project #:		Date Received:	
	Amount Paid:		Time Received:	

APPLICANT AND OWNER INFORMATION

Name of Applicant: Marker 44 HOLDINGS, LLC Telephone # 603-743-6649

Address of Applicant: 130 Central Street, Dover NH 03820

E-Mail Address: wfhopkins@hotmail.com

Name of Property Owner (*if different from applicant*): Same Telephone # See Above

Address of Property Owner: See Above

PROPERTY INFORMATION

Assessor's Map # 24 Lot(s) # 114, 115-B

Zoning District(s) CBD-G, CWD Overlay District(s) Wetland Protection District
Conservation Overlay District

Existing Use of Property: Residential/unimproved

CONDITIONAL USE PERMIT INFORMATION

Type of Conditional Use Permit (Check All That Apply):

☒ Conservation District
☐ Groundwater Protection
☒ Wetland Protection District
☐ RCM Use Overlay District
☐ Off-Street Parking and Loading
☒ Wetland Protection
☐ I-1 District Uses

Describe Proposed Use or Activity That Requires Conditional Use Permit and Describe Any Impacts:

The project proposes to install utilities, a walking path, parking, retaining walls and conduct site grading within a small wetland finger, the 50' wetland buffer as well as regrading of steep slopes (>20%).

Total permanent impact area within the wetlands on-site is 181 s.f., temporary wetland impact 583 s.f., total 50' Dover wetland buffer impact will be 11,787 s.f., and the total impact to slopes >20% will be 20,256 s.f. A total of 150 sf of impact of previously developed 100' tidal buffer within Cocheco Street for sewer connection.

List Any Associated State or Federal Permits That Have Been or Will Be Applied For and Indicate Their Status: Minimum Expedited Wetland Permit

Name of Professional That Prepared Plans: Stephen J. Haight

Address PO Box 1166, Dover, NH 03821 Telephone #: 603-749-0443

Professional License #: 7978 E-mail address: shaight@civilworksne.com

SIGNATURES

I/We hereby submit this application to the City of Dover Planning Board and attest that to the best of my knowledge all of the information on this application form and in the accompanying application materials and documentation is true and accurate. As applicant or as agent, I attest that I am duly authorized to act in this capacity.

Signature of Property Owner: _____ Date: 7/19/18

Signature of Applicant (*if different from owner*): _____ Date: _____

Signature of Agent: _____ Date: 7/20/18

AUTHORIZATION TO ENTER SUBJECT PROPERTY

I, and my successors, hereby authorize members of the Dover Planning Board, Planning Department and other pertinent City Departments and boards to enter my property for the purpose of evaluating this application, including performing inspections during the application phase, post-approval phase, construction phase and occupancy phase. It is understood that these individuals must use all reasonable care, courtesy, and diligence when on the property.

Signature of Property Owner: _____ Date: 7/19/18

CITY OF DOVER CONDITIONAL USE LIST OF ABUTTERS

Pursuant to RSA 676:4, the State Law of New Hampshire, the City of Dover is required to notify the applicant, abutters (including holders of conservation easements), and any professional whose seal is on the plan, of the public hearing by certified mail, return receipt requested. The applicant must obtain the abutter information from the records of the Tax Assessor's Office (not more than five days prior to filing) in order to process the site review application.

ABUTTER is defined as the owner of record of a parcel of land located in New Hampshire and that adjoins or is directly within two hundred (200) feet (including land across the street or waterway) of the proposed site under consideration by the Planning Board. For a condominium or other collective form of ownership, abutter means the officers of the collective or association. *(See additional requirement below)*

Owner:

TAX MAP	LOT #	PROPERTY OWNER	MAILING ADDRESS

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS

Surveyor and/or Engineer:

NAME	COMPANY	MAILING ADDRESS

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

Abutters:

TAX MAP	LOT #	OWNER (S) OF RECORD	MAILING ADDRESS
		TO BE DONE BY CITY OF DOVER	

PLANNING BOARD
APPLICATION CHECKLIST & FEE SCHEDULE

A. If you are submitting an application for Site Review or a Major Subdivision the applicant shall meet with the Technical Review Committee (TRC). Eight (8) copies of the application and preliminary plan must be submitted. _____

B. Prior to the submission deadline for Planning Board, fifteen (15) copies of the application and fifteen (15) sets of plans must be submitted. Four (4) 22" x 34"and eleven (11) 11" x 17" (signed by owner). _____

C. **TOTAL FEE** paid by cash or check made payable to "City of Dover"

1. Application fee for the following:
   - SUBDIVISION $150.00 x # _____ new lots created = $ _____
   - LOT LINE ADJUSTMENT $200.00 (if more than two lots involved, add $100.00 per lot) = $ _____
   - SITE REVIEW - RESIDENTIAL $100.00 x # ____ per dwelling unit = $ _____
   - SITE REVIEW – NON-RESIDENTIAL (not to exceed $10,000)
     New construction $.15 sq. ft. x # _____ sq. ft. = $ _____
     Additions (new floor space) $.10 per sq. ft. x # _____sq. ft. = $ _____
   - IMPERVIOUS PAVED AREA (for new development) OR IMPERVIOUS PARKING LOT ADDITIONS (not to exceed $10,000) $.07 sq. ft. x # _____ = $ _____
   - MOTEL/HOTEL $35.00 x # ___ per lodging unit = $ _____
   - CHANGE OF USE (not to exceed $5,000)
     Existing floor space $.10 per sq. ft. x # ____ sq. ft. = $ _____
   - CONDITIONAL USE PERMIT $150.00 x # _____ per application = $ 150.00
   - GRAVEL PIT/ EXTRACTION PERMIT
     Application fee $50.00 = $ _____
     Permit fee $75.00 = $ _____
   - EXTENSIONS OF/AMENDMENTS TO/WAIVERS FOR AN APPROVED PLAN ($150.00 minimum) $50.00 x # ____ per hour of review $ _____
   - REQUEST FOR REZONING $150.00 = $ _____
   - DRIVEWAY WAIVER – $100.00 application fee =
     Letter of rejection from Engineering Department, diagram & letter from owner $ _____

D. **Mailing Labels (Avery 5160)** in triplicate including owner, engineer, architect, land surveyor, or soil scientist whose professional seal appears on the plat with names and addresses for notices.

1. Certified letters fee: # of abutters _____ X $8.00 = $ _____
2. Applicant & Owner, engineer, architect, land surveyor or soil scientist Certified letters fee # _____ of x $8.00 = $ _____
3. First Class Mail fee (for individual owner of units within a condominium or other collective form of ownership): # of abutters _____ X $1.00 = $ _____
4. Creating/Printing Abutter Labels fee per sheet _____ x $10.00 = $ _____

E. **Foster's newspaper public notice fee** **$ 80.00**

F. **Digital Version of the Plan** & Archive Fee $1.00 x # _____ per sheet of plan set = $ _____

TOTAL FEE **$** 150.00

Lot Line Adjustment Application

City of Dover, New Hampshire
MINOR LOT LINE ADJUSTMENT APPLICATION

[Revision Date: May 18, 2017]

Office Use Only	Project #:		Date Received:	
	Amount Paid:		Time Received:	

APPLICANT INFORMATION

Name of Applicant: MARKER 44 HOLDINGS, LLC Telephone # (603) 743-6649

Address of Applicant: 130 Central Ave, Dover, NH 03820

FIRST PROPERTY OWNER AND PARCEL INFORMATION

Name of 1st Property Owner (*if different from applicant*): SAME Telephone # (603) 743-6649

Address of 1st Property Owner: Same

Address of Property: Same

Assessor's Map # 24 Lot(s) # 114

Property Deed: Book 4563 Page: 175

Zoning District(s) CBD-G Overlay District(s) CONSERVATION OVERLAY

Size of Existing Parcel (sq. ft.): 41,164 sf Size of Proposed Parcel (sq. ft.): 10,100 sf

SECOND PROPERTY OWNER AND PARCEL INFORMATION

Name of 2nd Property Owner (*if different from applicant*): Same Telephone # Same

Address of 2nd Property Owner: Same

Address of Property: Same

Assessor's Map # 24 Lot(s) # 115B

Property Deed: Book 4562 Page: 656

Zoning District(s) CWD Overlay District(s) CONSERVATION & WETLAND OVERLAY

Size of Existing Parcel (sq. ft.): 39,463 sf Size of Proposed Parcel (sq. ft.): 70,526 sf

[Use additional application form if more than two lots are being adjusted]

SURVEYOR INFORMATION

Name of Surveyor and Company (Licensed in N.H.) Kevin M. McEneaney P.L.S.

Address P.O. Box 681, 24 Chestnut Street, Dover, NH 03821 Telephone #: (603) 742-0911

Professional License #: 661 E-mail address: MSA@Surveynh.com

SIGNATURES

I/We hereby submit this application to the City of Dover Planning Board and attest that to the best of my knowledge all of the information on this application form and in the accompanying application materials and documentation is true and accurate. As applicant or as agent, I attest that I am duly authorized to act in this capacity.

Signature of First Property Owner: _____ Date: 7/19/18

Signature of Second Property Owner: _____ Date: 7/19/18

Signature of Applicant (*if different from owner*): _____ Date: _____

Signature of Agent: _____ Date: 7/20/18

AUTHORIZATION TO ENTER SUBJECT PROPERTY

I hereby authorize members of the Dover Planning Board, Planning Department and other pertinent City Departments and boards to enter my property for the purpose of evaluating this application, including performing inspections during the application phase, post-approval phase, construction phase and occupancy phase. It is understood that these individuals must use all reasonable care, courtesy, and diligence when on the property.

Signature of Property Owner: _____ Date: 7/19/18

CITY OF DOVER MINOR LOT LINE ADJUSTMENT
LIST OF ABUTTERS

Pursuant to RSA 676:4, the State Law of New Hampshire, the City of Dover is required to notify the applicant, abutters (including holders of conservation easements), and any professional whose seal is on the plan, of the public hearing by certified mail, return receipt requested. Staff will provide the abutter information, while the applicant must provide accurate contact information for the owner, applicant and professional agents representing the project.

First **Owner:**

TAX MAP	LOT #	PROPERTY OWNER	MAILING ADDRESS
Map 24	Lot 114	MARKER 44 HOLDINGS, LLC	130 Central Ave, Dover, NH 03820

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS
SAME		

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS
Kevin M. McEneaney P.L.S	McEneaney Survey, Inc.	P.O. Box 681, 24 Chestnut Street, Dover, NH 03821

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS

Second Owner:

Tax Map 24, Lot 115B
SAME

PLANNING BOARD
ESTIMATED FEE SCHEDULE

This is only provided to give you an estimate of the application fees. *After you submit an application, staff will invoice you a total.* All fees must be paid two weeks before the Planning Board meeting. **If the Fee has not been paid, the item will not be placed upon the agenda.**

A. TOTAL FEE paid by cash or check made payable to "City of Dover"

1. Application fee for the following:
   - SUBDIVISION $150.00 x # _____ new lots created = $ _____
   - LOT LINE ADJUSTMENT $200.00 (if more than two lots involved, add $100.00 per lot) = $ 200.00
   - SITE REVIEW - RESIDENTIAL $100.00 x # _____ per dwelling unit = $ _____
   - SITE REVIEW – NON-RESIDENTIAL (not to exceed $10,000)
     New construction $.15 sq. ft. x # _____ sq. ft. = $ _____
     Additions (new floor space) $.10 per sq. ft. x # _____sq. ft. = $ _____
   - IMPERVIOUS PAVED AREA (for new development) OR IMPERVIOUS PARKING LOT ADDITIONS (not to exceed $10,000) $.07 sq. ft. x # _____ = $ _____
   - MOTEL/HOTEL $35.00 x # ____ per lodging unit = $ _____
   - CHANGE OF USE (not to exceed $5,000)
     Existing floor space $.10 per sq. ft. x # _____ sq. ft. = $ _____
   - CONDITIONAL USE PERMIT $150.00 x # _____ per application = $ _____
   - GRAVEL PIT/ EXCAVATIONS - Application fee $50.00 & Permit fee $75.00 = $ _____
   - EXTENSIONS OF/AMENDMENTS TO/WAIVERS FOR AN APPROVED PLAN ($150.00 minimum) $50.00 x # _____ per hour of review $ _____
   - REQUEST FOR REZONING $150.00 = $ _____
   - DRIVEWAY WAIVER – $100.00 application fee =
     Letter of rejection from Engineering Department, diagram & letter from owner $ _____

B. Abutter Notification/Mailing Labels - this office will create and print the abutter list and provide labels in triplicate for each abutter. The applicant/owner will need to provide to this office the engineer, architect, land surveyor or soil scientist whose professional seal appears on the plan with names and addresses for notices. You will be notified with the amount due, once this has been completed.

1. Applicant & Owner, engineer, architect, land surveyor or soil scientist
   Certified letters fee # _____ of x $8.00 =
2. Certified letters fee: # of abutters _____ X $8.00 = $ _____
3. First Class Mail fee (for individual owner of units within a condominium or other collective form of ownership): # of abutters _____ X $1.00 = $ _____
4. Creating/Printing Abutter Labels in triplicate per sheet _____ x $10.00 = $ _____

C. Foster's newspaper public notice fee $ ~~80.00~~

D. Digital Version of the Plan in PDF/A format or Archive Fee $1.00 x # 1 per sheet of plan set = $ _____

(Revised May 15, 2017)

TOTAL FEE $ 280.00

City of Dover, New Hampshire
LOT LINE ADJUSTMENT SUBMISSION CHECKLIST

[Revision Date: May 15, 2017]

This review checklist is intended to assist the applicant in the planning process of preparing a Subdivision application for Planning Board action. The size of the project will determine the types of information required for review, therefore, a **pre-application conference** with the Planning Department to determine the list of items that must be completed is strongly encouraged.

Fifteen (15), folded, copies of the plan set and materials will be due 3 weeks prior to the Planning Board meeting. Fees will be invoiced and are due 2 weeks prior to Planning Board.

The applicant is cautioned that this checklist is only a guide and is not intended to be a complete list of all subdivision requirements. Please refer to the Subdivision Regulations for full details.

APPLICANT: MARKER 44 HOLDINGS, LLC File Number: _____

PROPERTY LOCATION: 87 Portland Ave Tax Map: 24 Lot: 114

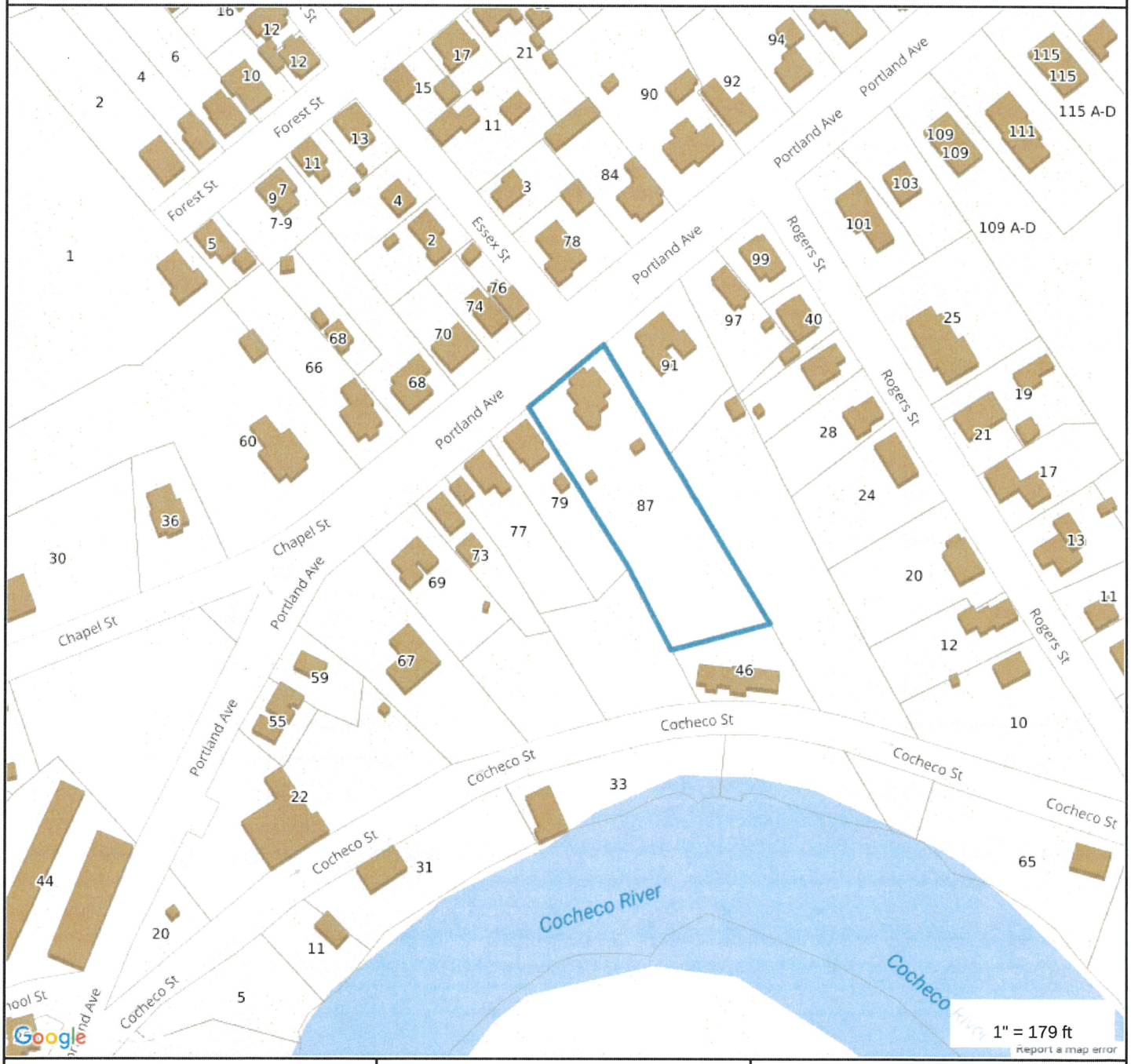
	Explain How Provided	Reviewed
1. Completed and signed Application form		
2. Electronic copy of the surveyed plat layout		
3. Electronic copy of supplementary materials and application		
4. List of all professional agents to be notified for Planning Board		
5. Fifteen copies of LLA plan w/scale of not less than 1"=50' or 1"=100' for larger adjustments. Plans shall contain the following items as appropriate:		
Location map at appropriate scale		
Planning File #		
Date, north arrow and scale		
Names of all abutting property owners		
Name and address of owners		
Signature & stamp of NH licensed land surveyor		
Zoning District boundaries, including any special or overlay districts		
Location of Conservation District areas		
Location, names and widths of existing and streets, including pavement widths, grades, curbs and crosswalks		
Location and widths of existing & proposed easements & right of ways		
Existing and proposed property lines with dimensions and bearings tied into Dover's Geographic Information System coordinate system		
Existing and proposed lot areas in square feet		
Existing and proposed buildings and structure locations		
Minimum building setbacks or build to lines on all lots		
Map and lot numbers for existing and proposed lots as assigned by Tax Assessor		
Location, material and size of existing and proposed permanent monuments		
All applicable Dover Common Subdivision notes		

REVIEWED BY: _____ DATE_____

June 26, 2018

Tax Map

Hopkins Court



Property Information

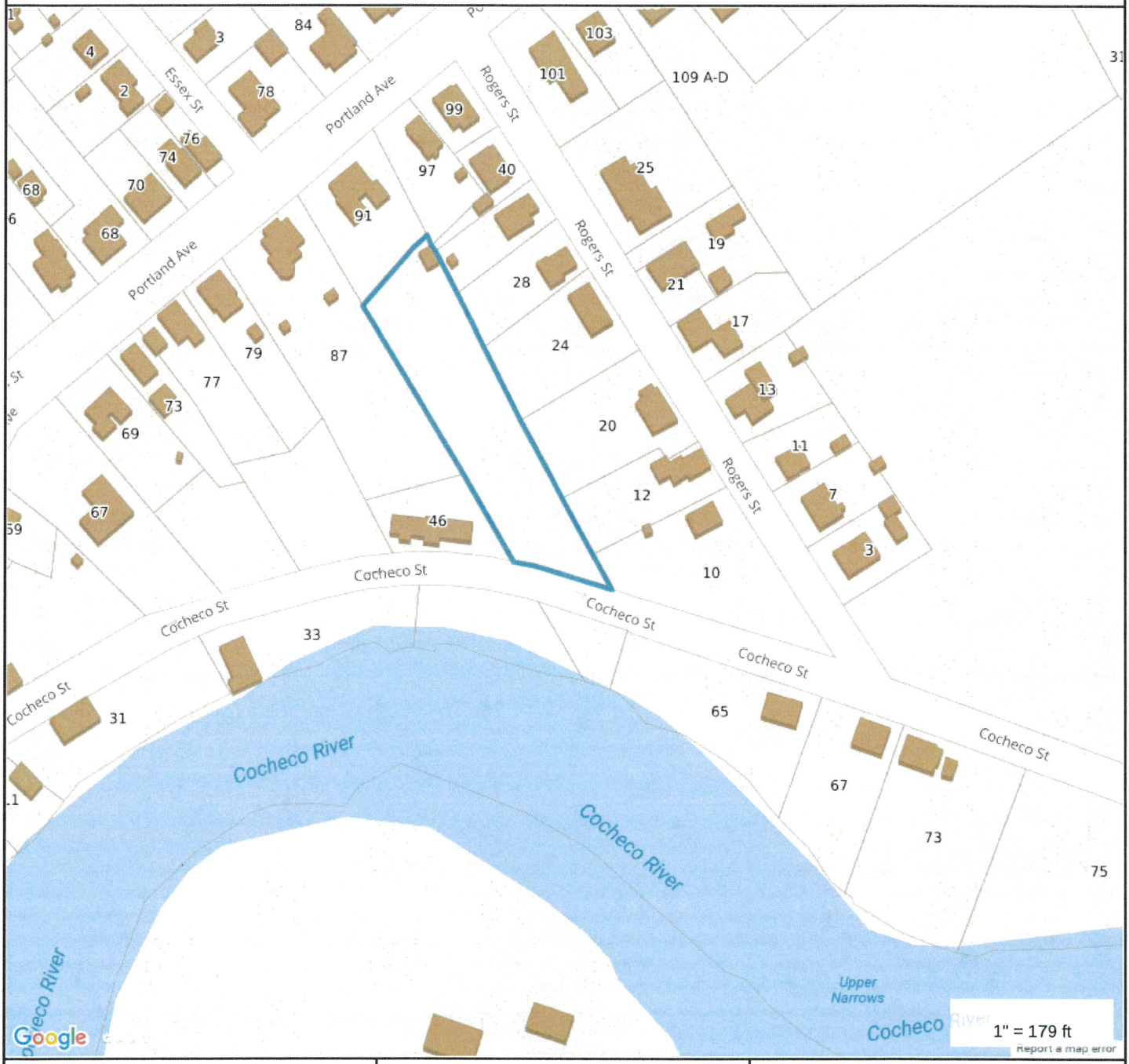
Property ID	24114-000000
Location	87 PORTLAND AV
Owner	MARKER 44 HOLDINGS LLC

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

City of Dover, NH makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Parcels updated 03/29/2018
Properties updated 05/16/2018

Hopkins Court



Property Information

Property ID	24115-B00000
Location	COCHECO ST
Owner	MARKER 44 HOLDINGS LLC

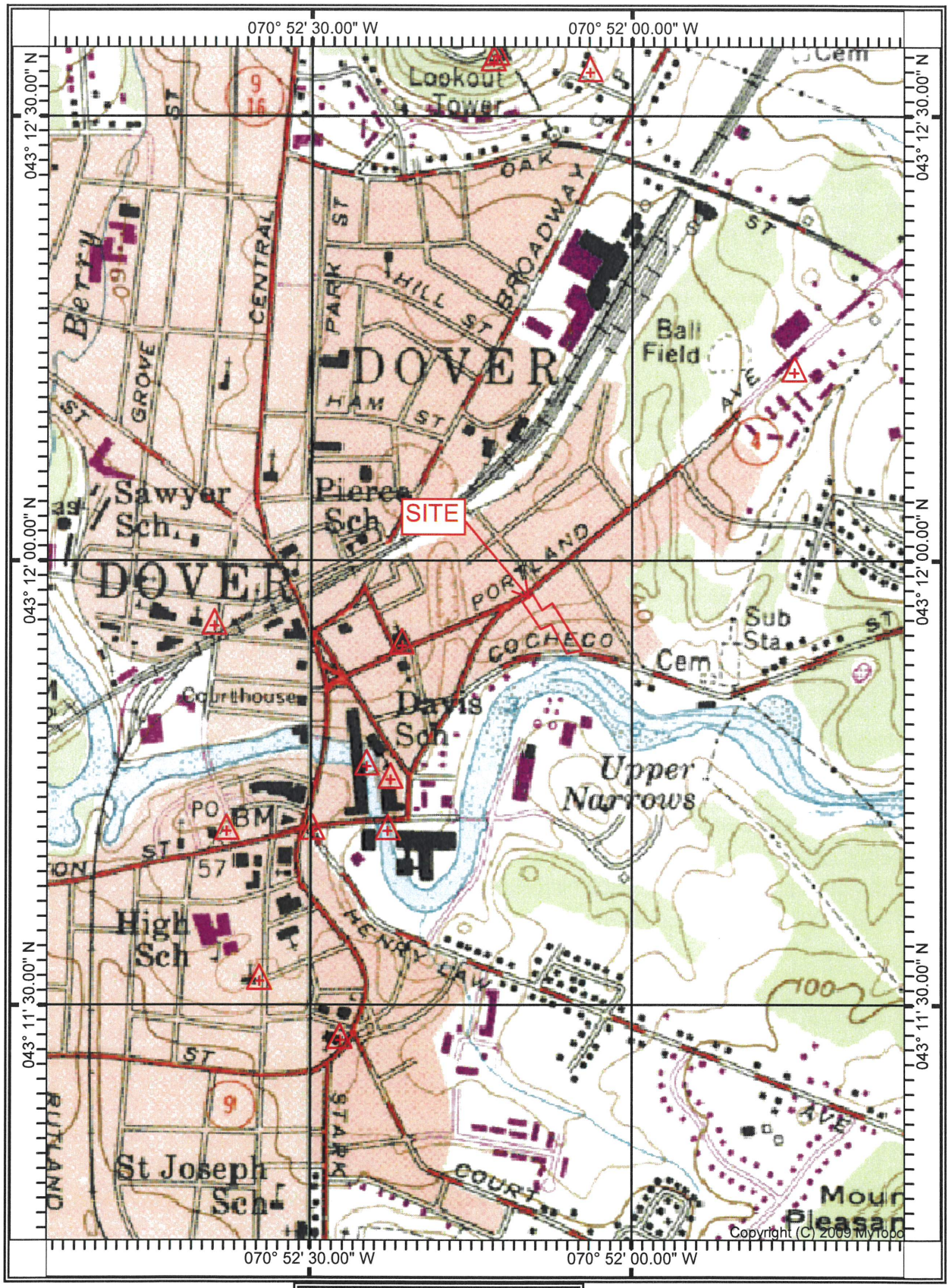
MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

City of Dover, NH makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Parcels updated 03/29/2018
Properties updated 05/16/2018

June 26, 2018

USGS Map



Hopkins Court

SCALE 1:12000

0 1000 2000 3000

FEET

June 26, 2018

DEEDS

Doc # 0004994 Apr 24, 2018 11:06 AM
Book 4562 Page 0656 Page 1 of 2
Register of Deeds, Strafford County

C/H
L-CHIP
STA128650

STATE OF NEW HAMPSHIRE
DEPARTMENT OF REVENUE ADMINISTRATION
REAL ESTATE TRANSFER TAX
****1 Thousand 6 Hundred 85 Dollars
DATE 04/24/2018 ST843757 AMOUNT $ ****1685.00
VOID IF ALTERED

WARRANTY DEED

KNOW ALL PERSONS BY THESE PRESENTS, that **Holgate Limited Partnership**, a New Hampshire limited partnership having a mailing address of 130 Central Avenue, Dover, New Hampshire, with an address of 130 Central Avenue, for consideration paid, grants to **Marker 44 Holdings, LLC**, a New Hampshire Limited Liability Company, with an address of 130 Central Avenue, Dover, New Hampshire, with Warranty Covenants, the following:

A certain tract or parcel of land, with any buildings thereon, situate on the northerly side of Cocheco Street, in the City of Dover, County of Strafford, State of New Hampshire, and being designated as Lot #2 on a plan entitled "Subdivision of Land, Dover, New Hampshire, Thomas Dumont, Sanford, Maine" dated November 26, 1984 by John W. Durgin Associates, Inc., recorded as Plan #24A-159 in the Strafford County Registry of Deeds, bounded and described as follows:

Beginning at a point on the northerly side of Cocheco Street at land now or formerly of John W. and Rita C. Printy; thence running N 15° 41' 34" W by and along said Printy land and land now or formerly of Esther, Irene and Michael J. Spinelli a distance of 353.78 feet to a point at Lot #1 as set forth on said plan; thence turning and running N 57° 15' 00" E by and along said Lot #1 a distance of 90.14 feet to a point; thence turning and running N 75° 06' 10" E by and along Lot # 1 a distance of 22.0 feet to a point at land now or formerly of Margaret Flowers; thence turning and running S 12° 29' 35" E by and along said Flowers land, land now or formerly of James E. Dupuis, land now or formerly of Shirley and Walter Klare, and land now or formerly of Theani M. Allard a distance of 239.92 feet to a concrete bound at land now or formerly of D. James and Nancy McAtavey; thence turning and running S 12° 17' 10" E by and along said McAtavey land, land now or formerly of Robert L. and Gail W. Mohrbacher and land now or formerly of Bruce S. and Barbara A. Curran a distance of 233.12 feet to a steel stake on the northerly sideline of said Cocheco Street; thence turning and running N 56° 56' 15" W by and along said Cocheco Street a distance of 122.79 feet to a point at land now or formerly of John W. and Rita C. Printy and the point of beginning. Containing 39,906 square feet.

Together with a 22 foot wide right of way for the purpose of vehicular and pedestrian ingress and egress from Portland Street across Lot # 1 as shown on said plan as reserved in the Warranty Deed from Thomas P. Dumont and Janet E. Dumont to David A. Rosania of record in the Strafford County Registry of Deeds. Said right-of-way is conveyed subject to and together with all the rights, duties and obligations as more particularly set forth in said deed.

Meaning and intending to convey the same premises conveyed to Holgate Limited Partnership by Warranty Deed of Dean Street Holdings, Inc. of even date to be recorded herewith.

Dated this 23rd day of April, 2018.

Holgate Limited Partnership
By Harrington Holdings, Inc., its
General Partner

Tammy A Melnick
Witness

By: _____
Kristen M. Hopkins, duly authorized
Vice President

State of New Hampshire
Strafford, ss

Personally appeared Kristen M. Hopkins, duly authorized Vice President of Harrington Holdings, Inc., General Partner of Holgate Limited Partnership and acknowledged that she executed the above instrument as her free act and deed on behalf of the Partnership, before me, this 23rd day of April, 2018.

_____
Notary Public
My Commission Expires:

TAMMY A. MELNICK
MY COMMISSION EXPIRES FEB. 21, 2023
NOTARY PUBLIC
NEW HAMPSHIRE

Doc # 0005111 Apr 25, 2018 2:34 PM
Book 4563 Page 0175 Page 1 of 2
Register of Deeds, Strafford County

C/H
L-CHIP
STA128720

STATE OF NEW HAMPSHIRE
DEPARTMENT OF REVENUE ADMINISTRATION
REAL ESTATE TRANSFER TAX
****8 Thousand 3 Hundred 25 Dollars
DATE 04/25/2018 ST843782 $ ****8325.00 AMOUNT
VOID IF ALTERED

Recording information above this line)

WARRANTY DEED

KNOW ALL PERSONS BY THESE PRESENTS, that **Michael J. Spinelli, Jr.,** married, individually and as Trustee of the Irene V. Spinelli Family Revocable Trust of 2001, with a mailing address of 87 Portland Avenue, Dover, County of Strafford, State of New Hampshire 03820, hereinafter referred to as the Grantor, for consideration paid, grants to **Marker 44 Holdings, LLC** a New Hampshire limited liability company with a mailing address of 130 Central Avenue, Dover, County of Strafford, State of New Hampshire 03820, as the Grantee, with **WARRANTY COVENANTS the following described land with buildings thereon:**

Dover, New Hampshire

A certain tract of land, with the buildings thereon, situate in Dover, Strafford County, New Hampshire and being more particularly described as follows:

Beginning at a wire spike on the southeasterly side of Portland Avenue at the westerly corner of land, now or formerly, of Augustus W. Thompson, later of M.E. Flower; thence southeasterly by land of said Flower three hundred eighty one (381) feet, more or less, to an iron pin; thence southwesterly by land now or formerly of W. Printy, one hundred twelve and four tenths (112.4) feet, more or less, to an iron hub; thence northwesterly by land, now or formerly, of Twin State Gas Electric Company, and later, to an iron pipe at the easterly corner of land, now or formerly, of Moulton, later of A.J. Michaud; thence continuing northwesterly by land of said Michaud two hundred twenty-five and seven-tenths (225.7) feet, more or less, to a wire spike; thence northeasterly by Portland Avenue one hundred fifteen and five-tenths (115.5) feet, more or less, to the point of beginning.

Said premises are known as Lot No. 114 on Sheet 24 of the Assessor's Plans. Also being shown on plan recorded with the Strafford County Registry of Deeds at Plan 32-34.

Meaning and intending to convey all right, title and interest in the conveyed premises that the grantor may have as heir of Irene V. Spinelli, who died March 17, 2012. See Estate of Irene V. Spinelli, Strafford County Registry of Probate, #2014-606.

Further reference is made to Affidavit dated July 22, 2003 and recorded at Book 2817, Page 228, Strafford County Registry of Deeds.

Dated this 25th day of April, 2018

Michael J. Spinelli, Jr. Individually
and as Trustee of the Irene V. Spinelli
Family Revocable Trust of 2001

STATE OF NEW HAMPSHIRE
COUNTY OF STRAFFORD

Apr. 25, 2018

Personally appeared the above named Michael J. Spinelli, Jr., individually and as Trustee of the Irene V. Spinelli Family Revocable Trust of 2001 known to me, or satisfactorily proven, to be the person whose name is subscribed above, and acknowledged that he has executed the same for the purposes herein contained.

DAVID P. AZARIAN
MY COMMISSION EXPIRES MAY 18, 2021
NOTARY PUBLIC
NEW HAMPSHIRE

Notary Public/Justice of the Peace

Name (typed or printed)

My Commission Expires:

July 9, 2018

Project Narrative

PROJECT NARRATIVE
SITE REVIEW PERMIT
For

COCHECO LANDING
Marker 44 Holdings, LLC
130 Central Avenue
Dover, NH 03820

Tax Map 24, Lot 114 &
Tax Map 24, Lot 115B

PROJECT OVERVIEW
The project consists of the following general improvements:

- Deconstruction of the existing parking area and shed.
- Construction of four (4) multi-unit apartment buildings with a 24' wide paved driveway and associated onsite parking.
- Construction of stormwater detention and grading on-site.
- Underground utility construction
- Loam and seed disturbed areas.

PROJECT LOCATION AND SITE CHARACTERISTICS
The project site is located in portions of the Dover Downtown Gateway Sub-District as well as the Cocheco Waterfront District. The existing site consists of two parcels of land as shown on Tax Map 24, Lots 114 and 115B. The two parcels contain a total of 1.85 acres. There is an existing 2-unit, two-story apartment building and parking area on lot 24-114 and an old garage on parcel 24-115b. The parcels contain mostly woodland and generally slope from west to east. There are minor wetlands located on the eastern portion of the site which appear to have been highly manipulated by past and ongoing human activity. There is an existing drainage channel which leads to a catch basin along Cocheco Street.

The project proposes to initially combine portions of the two lots with a Lot Line Adjustment application. The existing 2-unit apartment building along Portland Avenue will remain on Map/Lot 24-114 and contain +/- 10,100 sf. The remaining land, which has frontage along Cocheco Street, will make up the remainder of Map/Lot 24-115b. The applicants propose to construct four (4) new multi-unit apartment buildings and a 24' wide driveway on lot 24-115b. The proposed driveway will be 24' wide, accessed from Portland Road, and serve both the existing building and proposed apartment buildings.

DRIVEWAY AND PARKING LAYOUT

The proposed driveway will be 24' wide with curbing and sidewalk. The proposed entrance located along Portland Road is 24' wide and will utilize the same curb cut location as the existing entrance, widening the existing entrance appropriately. This will continue to be the only driveway entrance located on the lot. The proposed driveway within the site allows for vehicular and pedestrian access to the existing building and proposed (4) multi-unit apartment buildings. Driveway grades range from 0-11%. Lighting for the proposed driveway and parking areas will be installed as per the lighting plan.

Handicap accessible routes, van accessible spaces, and accessible spaces have been coordinated within the site to accommodate ADA requirements. Double stacked parking spaces have been located behind the existing two-family home including a handicap accessible space. There are four parking "pods" located around the site. Additional to the outdoor parking there are 8 parking spots located on the ground floor for each of the (4) proposed buildings. All parking spaces shall be 9' x 18' in dimension.

For the proposed development, the City of Dover Parking maximums allow for the following:

- CBD-G (2 Units)*(1.25+.4) = 3.3 Spaces Maximum
- CWD (32 Units)*(1.4+.5) = 60.8 Spaces Maximum
    - Total for Site = **64.1 Spaces Maximum**

- Proposed (8 Garage Spaces)*(4 Buildings) = 32 Spaces
- Proposed Surface Spaces = 34 Spaces
- Total proposed = 66 Spaces (4 Accessible Spaces)

WETLAND AND MINIMUM IMPACT TYPE

The project work meets the criteria under Minimum Impact Project Type. The project work involves the alteration of significantly less than 3,000 square feet (+/- 181 sf Permanent Impact and +/- 583 sf Temporary Impact) within swamps or wet meadows. The project does not impact bogs, marshes, sand dunes, tidal wetlands, cedar swamps, undisturbed tidal buffer zone, or involve any work within 50 feet of a salt marsh. The project is not located within 100 feet of prime wetlands. There are no known or suspected archaeological resources within the project area. The wetland is dominated by invasive species and has been highly manipulated by past and on-going human activity.

The proposed development area is primarily north of the wetlands in question. This allows for the least impact to the wetlands and the buffer area on the two properties. A small portion of a wetland finger and the 50' wetland buffer zone will be impacted by the southernmost development areas planned for parking. The total amount of alteration and disturbance for the

wetland will be +/- 181 Permanent Impact and +/- 583 sf Temporary Impact sf and the amount within the 50' buffer area to be altered or disturbed will be +/- 11,787 sf.

The wetland will be temporarily impacted by utility crossings for a sewer line and then subsequently restored. A 4' asphalt walking trail will traverse across a narrow portion of the wetland. The wetlands will also be permanently impacted by a 5' walking trail leading to the waterfront via Cocheco Street. The proposed walking trail will be made of asphalt and cross the wetland for approximately 15'.

DRAINAGE

A drainage analysis was completed of two subject parcels Map 24-115b (1.62 AC) and 24-114 (0.23 AC) containing 1.85 acres under the same ownership. There is an existing 2-unit, two-story apartment building and driveway on lot 24-114 and an old, unusable garage with some pavement and lawn area located on parcel 24-115b. Overall the parcels contain mostly lawn and woodland area and generally slope from west (Portland Ave.) to east (Cocheco St.). At the lowest portion of the site is a single catch basin located along Cocheco Street. This area contains a small wetland comprised of a drainage channel leading into the existing catchbasin. The proposed development of the site will retain the existing house on lot 24-114 and remove the unusable garage and other existing improvements on lot 24-115b. The new improvements will consist of a 24' driveway, (4) 5-story apartment buildings, associated utilities, and a walking path. Aside from the walking path, sewer line, and a portion of the parking area, the improvements will remain west and upslope from the existing wetlands which will not be impacted by the construction of the apartment buildings.

Development of the site includes the use of porous pavement, catchbasin CDS stormfilters, and underground detention to achieve the suitable peak flow attenuation. In general the driveway and parking areas of the development, drain into two catchbasins with stormfilter filtration and porous pavement areas. Along the lower two parking areas an underground detention system was used to control the peak flows from the onsite impervious area and roof areas. Neglible increases in total runoff occur with all discharge points, however, the total amount will not contribute to flooding or functional impairments to streets, adjacent properties, or downstream properties. Peak flows have been attenuated for the 2 yr, 10 yr, 25 yr, and 50 yr storms for all discharge points.

TRAFFIC

A traffic study was completed for the project and is attached as a report to this submittal. Overall and as expected, there is an increase in traffic due to the proposed new 32 unit multifamily dwelling. There was an increase of 15 AM peak hour trips and 20 PM peak hour

trips. Overall weekday total trip generation (entering and exiting) will be an increase of 211 vehicle trips. In the report, it is suggested that the existing condition of street parking along Portland Ave be considered to be "no parking" for a length of seven spaces.

UTILITIES

The proposed project expects to connect to City of Dover water and sewer as well as Unitil natural gas, and eversource electric. Natural Gas lines are located within the Portland Road right-of-way which is the anticipated location for this connection. City of Dover water and sewer lines are located within both the Portland Road and Cocheco Street rights-of-way. The project anticipates connecting to City of Dover water via the Portland Road water main. Internal water services will be 6" mains with 2" connections to the buildings. Buildings will be sprinkled and connections made per the City's Community Services Utility Division and Fire Department requirements and standards. The project plans to connect to the gravity sewer lines in Cocheco Street. Electricity for the site is proposed to be provided by the existing electric lines located along Cocheco Street.

FISCAL IMPACT

A Fiscal Impact Analysis was completed for this development and is a part of this submittal. It is estimated that a total of (5) children will attend public schools due to the development and a total of 54 new residents will live in the complex. As explained in the report, there are no significantly surprising or burdensome effects from the proposed development. Tax revenue is estimated to increase to +/- $76,989 yearly for the proposed development.

Fiscal Impact

FISCAL IMPACT ANALYSIS

for the

MARKER 44 HOLDINGS, LLC
RESIDENTIAL DEVELOPMENT PROPOSAL

87 Portland Avenue
Dover, NH
(Lot 114 & 115-B, Tax Map 24)

as prepared for:
Marker 44 Holdings, LLC
130 Central Avenue
Dover, NH 03820

prepared by:
Civilworks New England
P.O. Box 1166
181 Watson Road
Dover, NH 03820

June, 2018

Overall Project Description

Marker 44 Holdings, LLC is proposing a 34-unit apartment complex at 87 Portland Avenue. This complex includes renovation of the existing two (2) units at 87 Portland Avenue plus 32 new units contained in four (4) buildings on the remaining land comprised of Lots 114 and 115-B as shown on Tax Map 24. Parking will be accommodated on site in accordance with the Site Review Regulations. Apartment rents will be at market rates.

As required by Section 149-13.A.) 18) of the Dover Site Plan Review Regulations, the aspects of concern identified therein are addressed below, with the probable effects of the project described herewith.

a) **Attendance at public schools:**
It is estimated that five (5) children from the residential units will attend public schools. (Source: Data from "Impact Fee Update 2018, Dover, NH"; January, 2018; prepared by BCM Planning, LLC.)
(0.153 children/apartment unit x 34 units = 5.2 children)

b) **Increase in vehicular traffic:**
Please refer to the attached Technical Memorandum dated June 6, 2018 for an assessment of the expected change in vehicular traffic resulting from the proposed change of use.

c) **Changes in the number of legal residents:**
It is anticipated that the increase in the number of legal residents will be about 54. (Source: Data from "Impact Fee Update 2018, Dover, NH"; January, 2018; prepared by BCM Planning, LLC).
(1.67 residents/apartment unit x 32 units = 54 new residents)

d) **Increases in municipal costs:**
The subject premises are served by municipal water and sewer. The Applicant will pay user fees to the municipality. Refuse will be collected and removed by private contractor. Real estate taxes shall be consistent with the rates and standards established by the City of Dover (and the State of New Hampshire). Appropriate municipal impact fees will be levied upon the Applicant pursuant to the City's current fee structure.

e) **Load on Public Utilities or Future Demand for Them:**
The municipal water system and municipal sewer system can adequately handle the net increase in water/sewer flows from 600 gallons per day to 10,200 gallons per day as calculated using NHDES standard average daily flow rates.

f) **Public Safety**:
The project will not have an adverse effect on public safety. The proposed structures will incorporate current security systems, including card/key controls, cameras in parking facilities, and fire suppression systems as required under adopted life safety codes.

g) **Changes in Tax Revenue**:
Based on information provided by the City of Dover Tax Assessor's Office, the current uses are assessed at a combined total value of $459,600. The proposed apartment use is similar to that at 2 Silver Street with the slight variation that proposed project will include eight (8) units per free-standing structure versus a single structure with 16 units. In either case, the structures provide parking at the ground level. These new units will add about $2,976,000 in assessment to the existing. At current tax rates, this amounts to an increase of about $76,989 in revenues to the City.

h) **Changes in Surface Drainage**:
Changes in surface drainage quantity and quality are addressed in the Drainage Calculations and Stormwater Management Plan.

i) **Increased Consumption of Groundwater**:
It is not anticipated that there will be any consumption of groundwater.

j) **Increased Refuse Disposal**:
It is recognized that each unit will generate refuse; however, the generator will pay for the refuse generated.

k) **Pollution of Water or Air**:
No pollution of water or air is contemplated from the project.

l) **Land Erosion or Loss of Tree Cover**:
A portion of the site (Lot 114) is previously developed/disturbed land. Approximately one (1) acre of the combined land area will be cleared and developed. Land erosion potential during construction will be controlled through utilization of Best Management Practices (BMP) prescribed by NHDES and monitoring in accordance with standard practices specified under the ACOE requirements for issuance of a SWPPP (over 40,000 s.f. of disturbance).

m) **Disturbance to other Aspects of the Natural Ecology**:
There will be no disturbance to the natural ecology given the urbanized setting of the project and permanent stormwater treatment practices set forth in the Stormwater Management System Inspection & Maintenance Plan.

n) **Blocking of Views**:

There will be no blocking of views.

o) **Harmony with the Character of Surrounding Development**:
Multi-family dwellings are a permitted use at the site. The proposed use is in harmony with surrounding properties.

p) **Location of Utilities**:
Public water and sewer exists at the site and therefore all necessary utilities are available to the Applicant.

July 9, 2018

Traffic Impact

CIVILWORKS NEW ENGLAND
181 WATSON ROAD
P.O. BOX 1166
DOVER, NH 03821-1166
PHONE: (603) 750.4266 FAX: (603) 749.7348

To: File
Cc: Marker 44 Holdings, LLC
From: Dana C. Lynch, P.E.
Date: June 6, 2018
Re: **Standard Traffic Impact Analysis**
87 Portland Avenue
Residential Development Proposal
Dover, NH
Our Reference No. 1795

1. Description of Site
The subject site consists of an existing brick structure on Lot 114, Tax Map 24 and vacant land shown as Lot 115-B. The total parcel area is 1.85 acres with street frontage and access provided via Portland Avenue. The proposal includes renovation of 2 existing units and construction of 32 new units in 5-story buildings.

2. Description of Roadways
Portland Avenue, also known as NH Route 4, is a two-way arterial roadway extending from the Dover CBD to the city limit at the Oak Street intersection, and into Maine to the east. The posted speed limit is 30 miles per hour. Adjacent land use transitions generally from residential, closer to downtown, to commercial uses and a municipal recreation complex closer to Oak Street.

In the area immediately surrounding the site, there are sidewalks along both sides of Portland Avenue. The lane configurations include 8-9 ft. wide shoulders, and in designated areas, on-street parking is permitted.

3. Sight Distance
Sight distance looking to the west (toward Portland Street) is in excess of 275 ft. at the existing drive. This meets or exceeds the guidelines set forth in the AASHTO "Green Book" for a posted speed of 30 mph.

Along the southerly side of Portland Avenue, directly in front of the subject parcel, there are approximately seven (7) designated parking spaces for on-street parking. These spaces are typically low use; however, their presence causes a potential for considerable limitation to sight distance for vehicles exiting the project site. If no vehicles are present, sight distance is well in excess of 400 ft.

In light of the provision for off-street parking addressed in the proposal and the current low use of the on-street parking spaces, consideration should be given to eliminating or reducing the on-street parking to ensure adequate sight distance, looking east toward Rogers Street, is continuously available.

4. & 5. Trip Generation and Distribution

The following is pertinent relative to trip generation and distribution associated with the subject project. It should be noted that Low-Rise Apartments (L.U.C. 221) was used to provide conservatively high values and provide ease of comparison. The proposed apartments and could also qualify as mid-rise apartments (L.U.C. 225) which have generally lower trip rates.

Data Source:
ITE Trip Generation, 7th Edition
Land Use Code (L.U.C.) 221, Low-Rise Apartment

Current Use:
2 apartment units

Proposed Project:
34 apartment units

Trip Generation:

- Current Use – Low-Rise (L.U.C. 221)

			Distribution	
Parameter	**Avg. Rate**	**Total Trip Ends**	**Entering**	**Exiting**
Average Weekday	6.59	13	6.5	6.5
A.M. Peak Hour	0.46	1	0	1
P.M. Peak Hour	0.58	1	1	0

- Proposed Use – Low-Rise Apartments (L.U.C. 221)

			Distribution	
Parameter	**Avg. Rate**	**Total Trip Ends**	**Entering**	**Exiting**
Average Weekday	6.59	224	112	112
A.M. Peak Hour	0.46	16	3	13
P.M. Peak Hour	0.58	20	13	7

Attachment A: Land Use Code 221, Low-Rise Apartment data sheets

Proposed Trip Distribution Estimates:
Data available through NHDOT indicates a June, 2014 average weekday traffic volume of 11,521 vehicles per day. This is actually very similar to counts in 1999 and less than counts from 2002, 2005, and 2008 (13,229, 13,613, and 12,092 respectively).

Predominant traffic movements, by observation, appear to be westbound (toward Dover) in the AM peak hour, and eastbound (toward Rollinsford and Maine) in the PM peak hour. Accordingly, a 60/40 split was used for distribution of the trips generated by the proposed project.

- Proposed Trip Distribution

Parameter	**Trips Entering**		**Trips Exiting**	
	From West	**From East**	**To West**	**To East**
A.M. Peak Hour	1	2	8	5
P.M. Peak Hour	8	5	3	4

6. Public Transit
COAST bus Route 2 and Wildcat Transit Route 3 are available within ¼ mile of the site, at Janeto's Market.

Marker 44 Holdings, LLC



Property Information

Property ID	24114-000000
Location	87 PORTLAND AV
Owner	MARKER 44 HOLDINGS LLC

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

City of Dover, NH makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Parcels updated 03/29/2018
Properties updated 06/05/2018

ATTACHMENT A

ITE Trip Generation, 7th Edition
Land Use Code (L.U.C.) 221
Low-Rise Apartment

Land Use: 221
Low-Rise Apartment

Description

Low-rise apartments (rental dwelling units) are units located in rental buildings that have one or two levels (floors), such as garden apartments. Apartment (Land Use 220), high-rise apartment (Land Use 222) and mid-rise apartment (Land Use 223) are related uses.

Additional Data

The peak hour of the generator typically coincided with the peak hour of the adjacent street traffic.

The sites were surveyed from the early 1970s to the late 1990s throughout the United States and Canada.

Source Numbers

11, 21, 71, 98, 110, 177, 192, 300, 305, 306, 320, 321, 525

Low-Rise Apartment
(221)

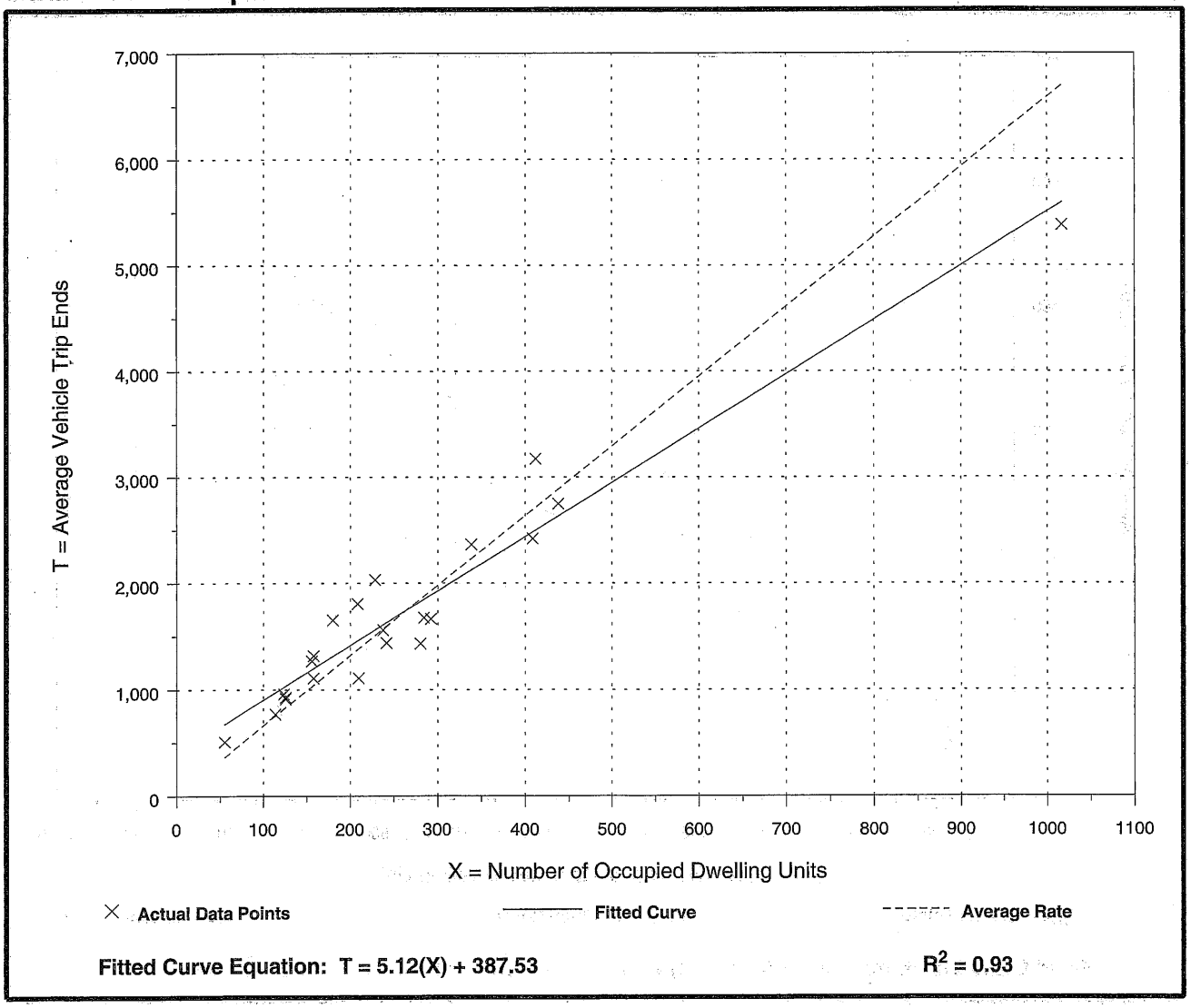
Average Vehicle Trip Ends vs: Occupied Dwelling Units
On a: Weekday

Number of Studies: 22
Avg. Num. of Occupied Dwelling Units: 264
Directional Distribution: 50% entering, 50% exiting

Trip Generation per Occupied Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
6.59	5.10 - 9.24	2.84

Data Plot and Equation



Fitted Curve Equation: T = 5.12(X) + 387.53

R^2 = 0.93

Low-Rise Apartment
(221)

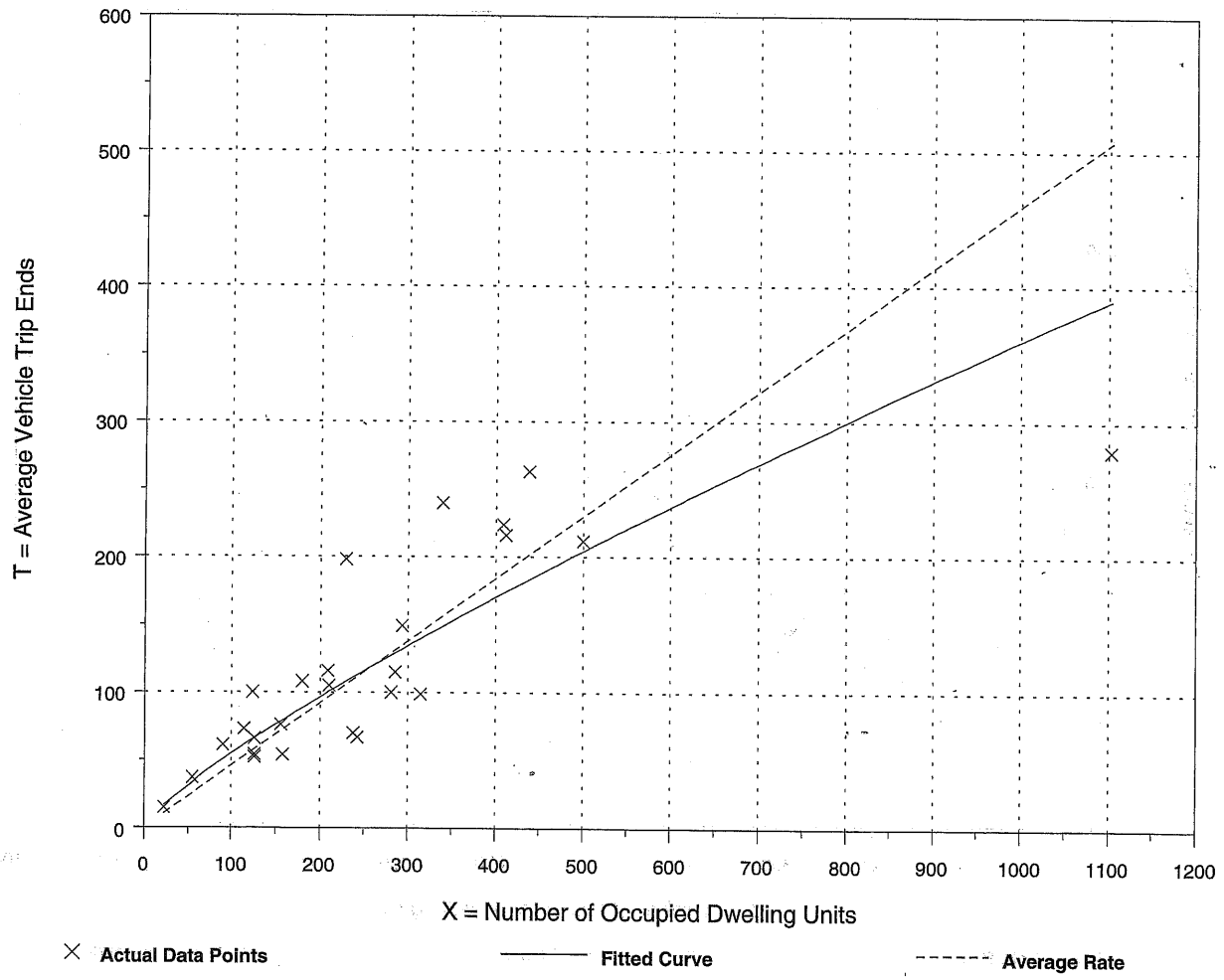
Average Vehicle Trip Ends vs: **Occupied Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Number of Studies: 27
Avg. Num. of Occupied Dwelling Units: 257
Directional Distribution: 21% entering, 79% exiting

Trip Generation per Occupied Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.46	0.25 - 0.86	0.70

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.82 Ln(X) + 0.23 $R^2 = 0.81$

Low-Rise Apartment
(221)

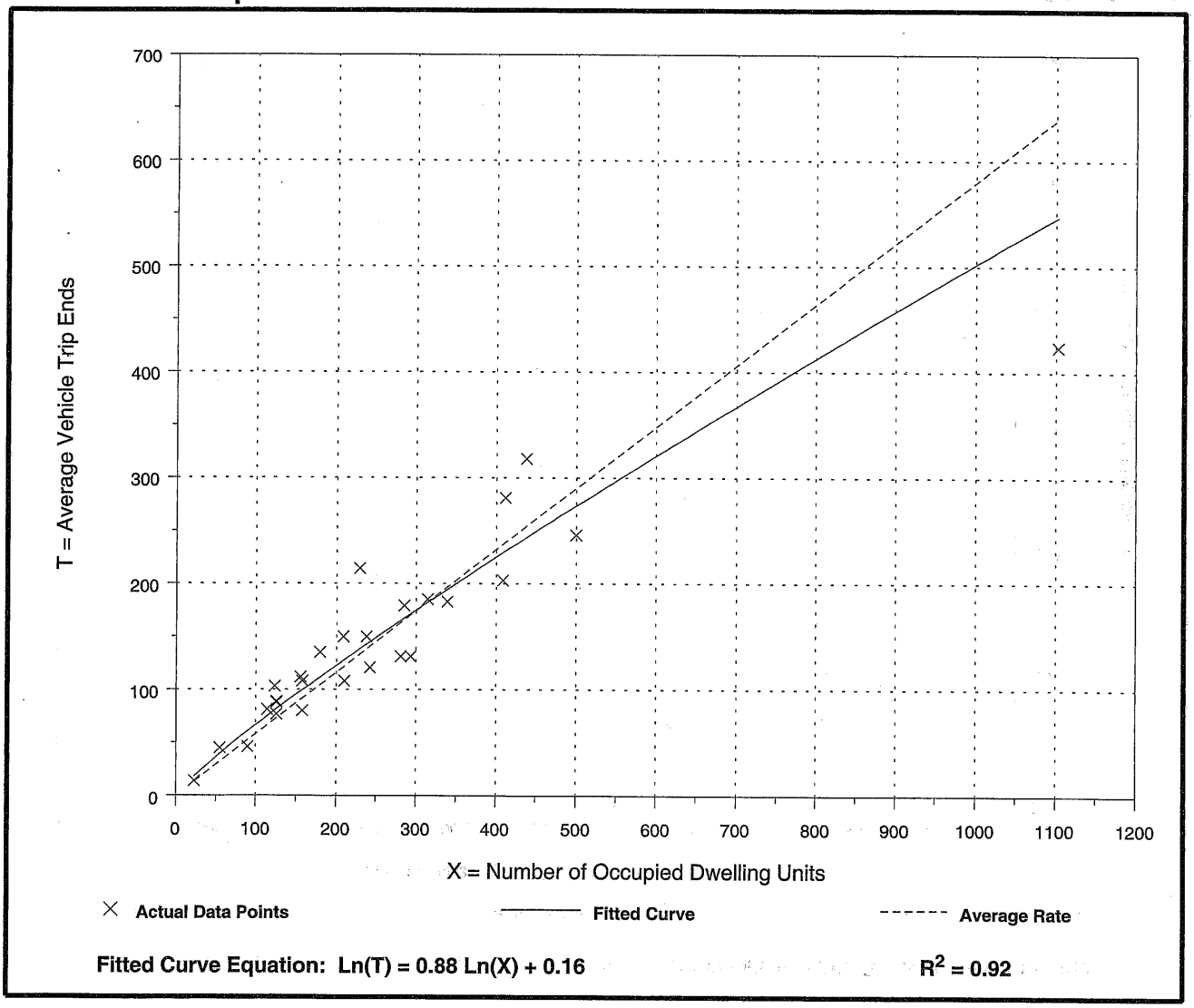
Average Vehicle Trip Ends vs: Occupied Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 27
Avg. Num. of Occupied Dwelling Units: 257
Directional Distribution: 65% entering, 35% exiting

Trip Generation per Occupied Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.58	0.38 - 0.93	0.77

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.88 Ln(X) + 0.16 $R^2 = 0.92$

ATTACHMENT B

NHDOT Bureau of Traffic
ATR Data for June 2014
Station 81125146-125147
Dover-NH 4, East of Essex St.

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC 2/22/2016
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF JUNE 2014

82 125047 DOVER- NH 4 (PORTLAND AVE) EAST OF ESSEX ST (EB-WB) (81125146-125147)

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
6	10	3	41	18	20	83	188	524	809	761	563	514	600	618	669	694	813	878	1002	777	527	449	298	179	101	63	11189
6	11	4	33	36	27	80	193	510	827	775	585	566	596	605	589	674	885	1024	1088	757	685	416	327	195	99	88	11660
6	12	5	38	26	33	65	200	507	889	778	608	549	655	659	698	612	846	960	1006	807	554	495	332	194	137	67	11715

TYPE	STATION	YEAR	MONTH	NO. DAYS	AVERAGE SUNDAY	AVERAGE WEEKDAY	AVERAGE SATURDAY	AVERAGE DAILY	COMPUTED VOLUME	PERCENT GAIN	PERCENT LOSS
82	125047	2014	June	3	0	11521	0	*	*		

PEAK HOUR VOLUMES:

	AVERAGE AM:	AVERAGE MIDDAY:	AVERAGE PM:
SUNDAY	*	*	*
WEEKDAY	842 *	689	1032 *
SATURDAY	*	*	*

AM - 6 AM TO 10 AM
MIDDAY - 10 AM TO 2 PM
PM - 2 PM TO 8 PM

Utility Letters

Matt Randall

From: White, Dave <D.White@dover.nh.gov>
Sent: Thursday, July 05, 2018 12:02 PM
To: Steve Haight; Young, Gretchen
Cc: Kristen Hopkins; Matt Randall; Boulanger, Bill
Subject: RE: Hopkins

we can provide water and sewer to service this and are currently looking at upgrades to the cocheco street pumpstation.

Dave White, PE
City Engineer
Dover, NH

From: Steve Haight [mailto:shaight@civilworksne.com]
Sent: Friday, June 29, 2018 3:24 PM
To: White, Dave <D.White@dover.nh.gov>; Young, Gretchen <G.Young@dover.nh.gov>
Cc: Kristen Hopkins <kristenhopkins@alumni.upenn.edu>; Matt Randall <mrandall@civilworksne.com>
Subject: Hopkins

Good afternoon Dave

We are working on a site plan for Bill and Kristen Hopkins on Portland Ave and are looking for confirmation of ability to provide services.

We are proposing to tie into water in Portland Ave and to tie sewer into the sewer in Cocheco Street

There is an existing duplex on site… the proposal is to add 4 new buildings with 8 - 2bedroom each (32 bedrooms @ 150/gpd/bdrm = 9,600 gpd)

The services would serve the 4 new buildings. The existing house will remain on its current water and sewer.

If you have any questions please feel free to reach out to me or Matt from my office directly

Best regards

Steve

Stephen J. Haight, P.E.
President
Civilworks New England/Haight Engineering, PLLC
181 Watson Road
P.O. Box 1166
Dover, New Hampshire 03821
O: 603.750.4266
C: 603.817.6651

Dear Valued Customer,

Thank you for your recent electric service request. We look forward to working with you on your new electric service connection or improvement project.

Please review the following information for accuracy and call 1-800-362-7764 or email us at NHNewService@eversource.com with any updates:

* Work Request Number:	3128732
* Work Request Date:	06/26/2018
* Customer Name:	Marker 44 Holdings
* Job Location:	87 Portland Ave, Dover, NH
* Contractor Name:	Kristen Hopkins
* Contractor Number:	(603) 742-7715

Requests such as this require close collaboration between you, Eversource, and possibly the city or town where service is being requested. Our Electric Service Process and Responsibilities Guide explains in detail this collaboration, and how your request will be processed. In the case of complex projects, there may be additional steps, which would be discussed directly with you.

To check on the status of your request at any time, please visit us at www.eversource.com. If you have any questions or need to cancel your request, please contact us by telephone or by email. Our Technicians are available Monday through Friday from 7:00 a.m. to 4:30 p.m., and are happy to assist you.

Eversource Electric Service Support Center.

Sincerely,

Eversource

Electric Service Support Center Team-NH

1-800-362-7764

NHNewService@eversource.com

Site Photographs



Picture 1



Picture 2



Picture 3



Picture 4



Picture 5



Picture 6



Picture 7



Picture 8



Picture 9



Picture 10



Picture 11



Picture12

ESSEX STREET

PORTLAND AVENUE

PHOTO NUMBER

SHEPA 100' SETBACK

SHEPA 50' SETBACK

COCHECHO RIVER

TIDAL

FLOOD

EBB

LOCATION PLAN

(NO SCALE)

15°37'22"

MAGNET OBS. 8/14/17

NH STATE PLANE GPS OBS. 8/2017 & 2017

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

CIVILWORKS NEW ENGLAND
CIVIL ENGINEERING
181 Watson Road, P.O. Box 2186
Dover, New Hampshire 03820
(603) 767-0443

NO.	REVISION	APP'D	DATE

DATE: 7-10-18
SCALE: 1"=30'
DRAWN BY: MJR
DESIGN BY: MJR
APPROVED BY: MJR
PROJECT NO.1795
FILE: PHOTOKEY

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

COCHECO LANDING
DOVER, NH

PHOTOKEY

June 26, 2018

NHB Review

NEW HAMPSHIRE NATURAL HERITAGE BUREAU
NHB DATACHECK RESULTS LETTER

To: Matthew Randall
181 Watson Ave
Dover, NH 03820

From: NH Natural Heritage Bureau

Date: 2/12/2018 (valid for one year from this date)

Re: Review by NH Natural Heritage Bureau of request submitted 2/5/2018

NHB File ID: NHB18-0460 **Applicant:** Matthew Randall

Location: Dover
Tax Maps: 24-114 & 24 115b

Project Description: A condominium/town house subdivision.

The NH Natural Heritage database has been checked by staff of the NH Natural Heritage Bureau and/or the NH Nongame and Endangered Species Program for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government.

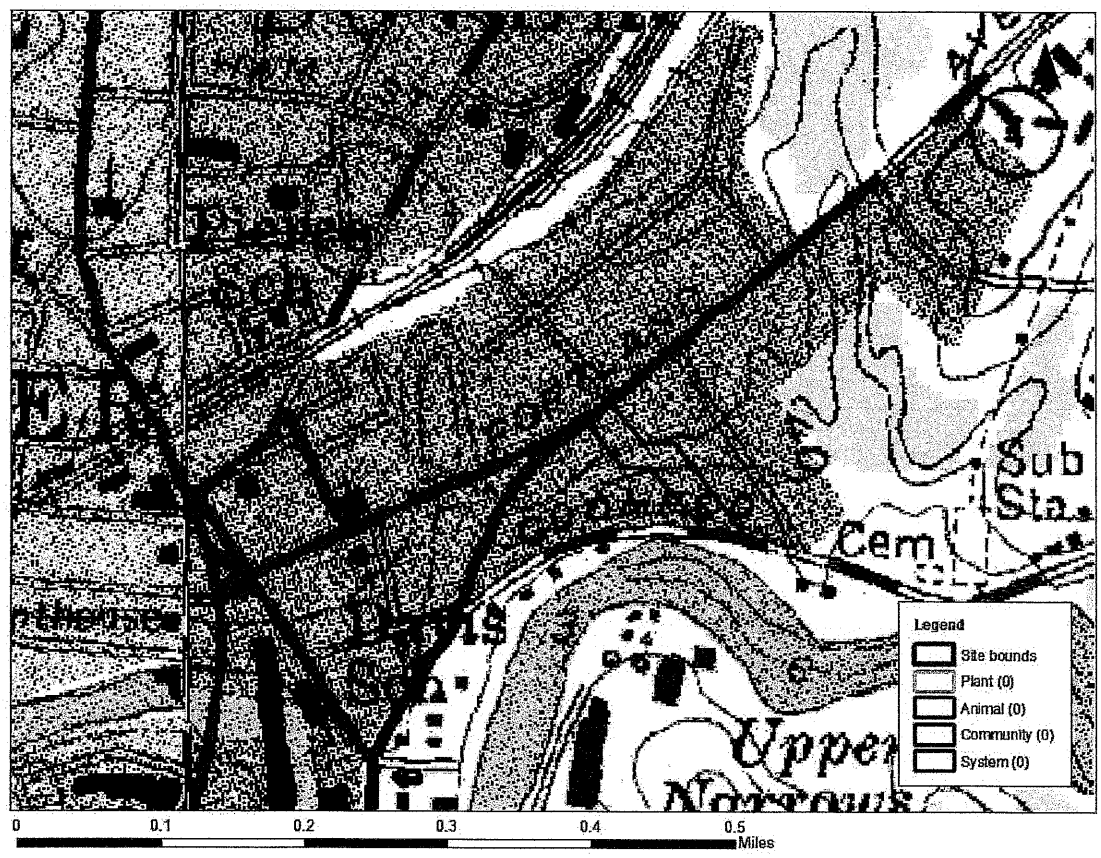
It was determined that, although there was a NHB record (e.g., rare wildlife, plant, and/or natural community) present in the vicinity, we do not expect that it will be impacted by the proposed project. This determination was made based on the project information submitted via the NHB Datacheck Tool on 2/5/2018, and cannot be used for any other project.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

MAP OF PROJECT BOUNDARIES FOR: **NHB18-0460**

NHB18-0460



Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

June 26, 2018

WETLAND REPORT

Michael Cuomo, Soil Scientist
6 York Pond Road, York, Maine 03909
207 363 4532
mcuomosoil@gmail.com

Steve Haight, P.E.
Civilworks of New England
P.O. Box 1166
Dover, NH 03820

1 December 2017

Dear Mr. Haight;

This letter is in reference to the vacant property located on Cocheco Street in Dover, NH. This is identified by the City of Dover as map 24, lot 115-B. On 30 November 2017 I inspected the property for regulated wetlands.

Wetlands were identified as defined by the State of New Hampshire.
Env-Wt 101.113 "Wetland" means "wetlands", as defined by RSA 482-A:2, X, namely "an area that is inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal conditions does support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetlands include swamps, marshes, bogs and similar areas.

Wetlands were identified on site using the technical criteria in the *Corps of Engineers Wetlands Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual*. These are the standards used by State and

Federal regulators and conform with local requirements.

A single wetland was identified at the southern end of the parcel. The western side of the wetland is marked with blue flags numbered 1 through 6. The east side of the wetland is marked with flags A1 to A7. The wetland continues off the property in both directions.

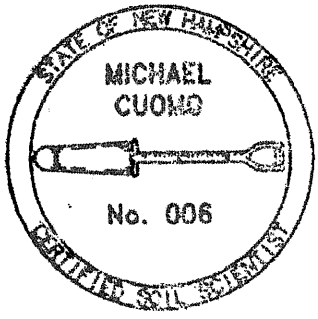
The wetland is highly manipulated by past and on-going human activity. Invasive plant species are widespread. Filling and soil excavation has occurred in the past. Dumping has occurred and is on-going. Excess run-off is sent to the site from abutting properties.

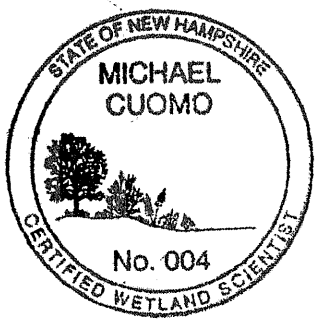
The property boundaries are not fully marked on this site. I made assumptions based on the aerial photo tax map overlay and occupation. I may need to revisit the site after the survey is finished to confirm the completeness of this work.

Please call if you have questions regarding this work.

Sincerely,

Michael Cuomo





Michael Cuomo
NH Wetland Scientist #004
NH Soil Scientist #006

Michael Cuomo, Soil Scientist
6 York Pond Road, York, Maine 03909
207 363 4532
mcuomosoil@gmail.com

Steve Haight, P.E.
Civilworks of New England
P.O. Box 1166
Dover, NH 03820

9 November 2017

Dear Mr. Haight;

This letter is in reference to the property located at 87 Portland Avenue in Dover, NH. On this date I inspected the property for regulated wetlands.

Wetlands were identified as defined by the State of New Hampshire.
Env-Wt 101.113 "Wetland" means "wetlands", as defined by RSA 482-A:2, X, namely "an area that is inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal conditions does support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetlands include swamps, marshes, bogs and similar areas.

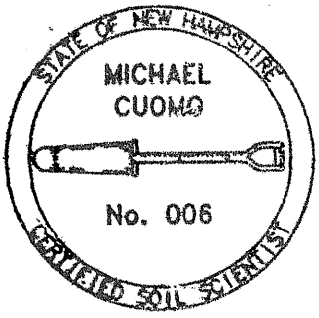
Wetlands were identified on site using the technical criteria in the *Corps of Engineers Wetlands Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual*. These are the standards used by State and Federal regulators and conform with local requirements.

There are no regulated wetlands on this property.

Please call if you have questions regarding this work.

Sincerely,

Michael Cuomo
NH Wetland Scientist #004
NH Soil Scientist #006





June 26, 2018

Inspection and Maintenance Plan

Stormwater Management System Inspection & Maintenance Plan

For

COCHECO LANDING

MAP 24, LOT 114
&
MAP 24, LOT 115B

87 Portland Avenue & Cocheco Street
Dover, New Hampshire
Strafford County

May 2018

Prepared For:

MARKER 44 HOLDINGS, LLC
130 Central Avenue
Dover, NH 03820

Prepared By:

CIVILWORKS NE
P.O. Box 1166
181 Watson Road
Dover, New Hampshire 03820

Introduction

Civilworks NE, has prepared the following Stormwater Management System Inspection & Maintenance Plan for Hopkins Court, Dover, NH. The intent of this plan is to provide a list of procedures that document the inspection and maintenance requirements of the Stormwater Management System for this site.

The following inspection and maintenance program is necessary in order to keep the Stormwater Management System functioning properly. These measures will also help to minimize potential environmental impacts to the areas surrounding the developed site. By following the enclosed procedures, the property owners, and maintenance personnel will be able to maintain the functional design of the Stormwater Management System and maximize its ability to remove sediment and other contaminants from site generated stormwater runoff while at the same time ensuring the recharge of groundwater resources through continued infiltration.

Owner

Marker 44 Holdings, LLC
130 Central Avenue
Dover, NH 03820

In the event of a change in ownership, this Inspection and Maintenance Plan shall be transferred to the new party; transfer shall be documented to NH DES in writing.

Contact / Responsible Party

Marker 44 Holdings, LLC
130 Central Avenue
Dover, NH 03820
(603) 743-6649

The contact information for the Contact / Responsible Party shall be kept current; transfer shall be documented to NHDES in writing.

Management Company

Marker 44 Holdings, LLC
130 Central Avenue
Dover, NH 03820

The contact information for the Management Party shall be kept current.

Inspection Schedule / Record Retention

Inspection frequency should, at a minimum, be in accordance with New Hampshire Stormwater Manual, Volume 2, latest edition, as updated by NHDES. See the Inspection and Maintenance Plan for frequency requirements. A copy of the completed Stormwater Management System's Inspection & Maintenance Log and Deicing Salt Quantity Use Log shall be maintained, kept on-site, and be made available to local, state, or federal regulators as applicable by law.

Stormwater Management System Components

The Stormwater Management System associated with the project is designed to mitigate both the quantity and quality of site-generated stormwater runoff and to recharge the underlying groundwater resources. As a result, its design includes the following elements:

- Culverts
- Detention Ponds (DP1)
- Energy Dissipation Structures (Rip Rap)
- Swales
- Catch Basins
- Catch Basins with CDS Stormwater
- Pavement and Porous Pavement
- Outlet Structures
- Litter / Trash Removal

Structure callouts in ( ) correlate to the design plans, a copy of which shall be maintained with this Inspection and Maintenance Plan.

Inspection and Maintenance Plan

By implementing the following procedures, the owners will be able to maintain the functional design of the Stormwater Management System and maximize the system's ability to remove sediment and other contaminants from site generated stormwater runoff and to effectively recharge the underlying groundwater resources.

CULVERTS:

- Inspect once per year.
- Inspect for clogging and sediment accumulation.
- Remove all debris immediately and sediment accumulations ≥ 2 inches.

DETENTION PONDS:

- Inspection, by a **qualified professional**, of detention ponds at least twice annually, and following any rainfall event exceeding 2.5 inches in a 24 hour period, with maintenance or rehabilitation conducted as warranted by such inspection.
- Embankments and spillways should be inspected by a **qualified professional** for settlement, erosion, seepage, animal burrows, woody vegetation, and other conditions that could degrade the embankment and reduce its stability for impounding water. Immediate corrective action should be implemented if any such conditions are found.
- Inlet and outlet pipes, inlet and outlet structures, energy dissipation structures or practices, and other structural appurtenances should be inspected by a **qualified professional**, and corrective action implemented (e.g., maintenance, repairs, or replacement) as indicated by such inspection.
- The bottoms, interior and exterior side slopes, and crest of earthen detention basins should be mowed, and the vegetation maintained in healthy condition, as appropriate to the function of the facility and type of vegetation.
- Vegetated embankments that serve as "berms" or "dams" that impound water should be mowed at least once annually to prevent the establishment of woody vegetation.
- Trash and debris should be removed from the pond and any inlet or outlet structures whenever observed.
- Accumulated sediment should be removed when it significantly affects pond capacity.

ENERGY DISSIPATION STRUCTURES (RIP RAP): As Applicable

- Inspect the outlet protection annually for damage and deterioration. Repair damages immediately.
- If stones become displaced from the riprap areas they should be replaced immediately and chinked in to assure stability. Add additional riprap as needed. Vegetation growing through the riprap should be eliminated at least yearly.

SWALES (RIP RAP LINED):

- Inspect once per year.

- Inspect for erosion, sediment accumulation, vegetation loss, and presence of invasive species.
- Remove debris and accumulated sediment, based on inspection.
- Repair eroded areas and provide additional rip rap as needed; remove invasive species and dead vegetation.

OUTLET STRUCTURE(S):

- Inspect once per year.
- Inspect for clogging and sediment accumulation.
- Remove all debris immediately and sediment accumulations $\geq$ 2 inches.

CATCH BASIN(S):

- Inspect once per year.
- Inspect for floatables, sediment accumulation, and hydrocarbons (oils and grease).
- Remove all floatables immediately and sediment accumulations $\geq$ 2 feet.
- Hydrocarbons shall be removed immediately by skimming, absorbent materials, or other methods and should be disposed of in accordance with applicable State and Federal regulations.

CATCH BASIN CDS STORMWATER FILTERS (S):

- Inspect twice per year
- Visually inspect that the system components are in working order and there are no blockages or obstructions in the inlet or separation screen.
- Quantify the accumulation if hydrocarbons, trash, and sediment in the system.
- When sediment has accumulated to 75% of the capacity of the isolated sump or appreciable levels of hydrocarbons and trash have accumulated, maintenance shall be performed.
- Maintenance should include the system being completely drained down and the sump being fully evacuated of sediment by the vacuum truck.

POROUS PAVEMENT:

- Minimize sanding.
- Minimize application of salt for ice control.
- Monitor periodically to ensure that the pavement surface drains effectively after storms.
- Clean periodically (1-2 times per year) using a sweeper or vacuum sweeper. Vacuum sweeping is the preferred method.

LITTER / TRASH REMOVAL:

- Routinely patrol site for litter pick up.

Inspection & Maintenance Table

System Component / BMP	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance / Cleanout Threshold
Culverts	Annually	Check for sediment accumulation and clogging	≥ 2 in. sediment depth
Detention Ponds • Outlet Structure • Inlet/Outlet Piping • Embankments • Pond Sediment • Trash/Debris • Vegetation (Veg.)	Bi-Annually " " " " Periodically " " " "	See Catch Basin (CB) Requirements (Req.) See Outlet Structure (OS) Req. Check for erosion, settlement, seepage, etc. Check for sediment accumulation in pond Check for trash (in pond and structures) • Maintain 95% veg. (pond & slopes) • Maintain healthy stand of veg.	See CB Req. See OS Req. Repair immediately ≥ 2 in. sediment Remove all trash/debris Restore veg. in-kind Mow when ≥ 6 in
Energy Dissipation (ED) Structures (RipRap)	Annually	Check for displaced stones Check for woody vegetation	Replace immediately Remove annually
Swales (Rip Rap Lined)	Annually	• Check for sediment accumulation • Check for erosion	≥ 1 in. sediment Repair immediately
Outlet Structure(s)	Annually	• Inspect once per year. • Inspect for clogging and sediment accumulation. • Remove all debris immediately and sediment accumulations ≥ 2 inches.	≥ 2 in. sediment Remove immediately
Catch Basins	Annually	• Check for sediment accumulation • Check for floatable contaminants	≥ 2 ft. sediment depth Remove all floatables
Catch Basin w/ CDS Stormwater Filter	Bi-Annually	• Check general condition of the system components and for obstructions • Check for accumulation of sediment, and blockages and appreciated levels of hydrocarbons and/or trash	>75% sediment on the catch basin floor, any blockages, appreciable mounts of trash
Pavement • Sanding • Salt Applications • Sweep/Vacuum • Trash/Debris	Limit use As Req. 1 - 2 x's Year Periodically	Minimize use to prevent tracking issues RECORD APPLICATION RATES Sweep or vacuum to prevent tracking issues Check for trash/debris	Sweep to prevent issues Minimize as Req. Sweep/Vac as needed Remove when noticed
Litter / Trash Removal	Periodically	Check for litter and trash	Remove when noticed

Inspection & Maintenance Checklist/Log

The following pages contain a blank copy of the Stormwater Management System's Inspection & Maintenance Log and a Deicing Salt Quantity Use Log. These forms are provided to assist the owners with the inspection and maintenance of the aforementioned Stormwater Management System.

Stormwater Management System's Inspection & Maintenance Log

Date of Inspection/Maintenance: _____ Inspector: _____

System Component / BMP	Cleaning / Repair Needed (List Items / Comments)	Date of Cleaning/Repair	Performed By

Deicing Salt Quantity Use Log

Date	Amount of Material Applied	Comments

July 9, 2018

Drainage Report

June 26, 2018

Design Plans

DRAINAGE ANALYSIS

for

Cocheco Landing

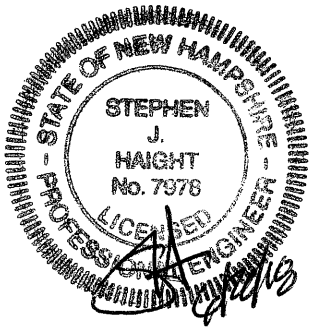
June 20, 2018

Prepared For:

Marker 44 Holdings, LLC
130 Central Avenue
Dover, NH 03820

Prepared By:

Civilworks NE
PO Box 1166
181 Watson Road
Dover, NH 03820



CIVILWORKS NEW ENGLAND
181 WATSON ROAD
P.O. BOX 1166
DOVER, NH 03821-1166
PHONE: 603.749.0443 FAX: 603.749.7348

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A-2 Developed Watersheds
- Drainage Diagram
- Area and Soil Listings
- Node Listing – 2-yr
- Node Listing – 10-yr
- Node Listing – 25-yr
- Node Listing – 50-yr
- 10-yr Storm Summary

CIVILWORKS NEW ENGLAND
181 WATSON ROAD
P.O. BOX 1166
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1.0 INTRODUCTION

This is a hydrologic analysis of two subject parcels Map 24-115b (1.62 AC) and 24-114 (0.23 AC) containing 1.85 acres under the same ownership. There is an existing 2-unit, two-story apartment building and driveway on lot 24-114 and an old, unusable garage with some pavement and lawn area located on parcel 24-115b. Overall the parcels contain mostly lawn and woodland area and generally slope from west (Portland Ave.) to east (Cocheco St.). At the lowest portion of the site is a single catch basin located along Cocheco Street. This area contains a small wetland comprised of a drainage channel outletting into the existing catchbasin. The proposed development of the site will retain the existing house on lot 24-114 and remove the unusable garage and other existing improvements on lot 24-115b. The new improvements will consist of a 24' driveway, (4) 5-story apartment buildings, associated utilities, and a walking path. The improvements, aside from the walking path, sewer line, and a portion of the parking area, will remain west and upslope from the existing wetlands which will not be impacted by the construction of the apartment buildings.

To effectively analyze the pre-development watershed and subject parcels, the watershed has been divided into four (4) points of analysis and nine (9) sub-catchments (sub-watersheds A1, A2, A3, A4, A5, A6, B, C, and D). Sub-watersheds A1-A6 discharge easterly, ultimately contributing to the existing catchbasin along Cocheco Street. Sub-watershed B discharges across the south and east property line toward Cocheco Street, south of the existing multi-family apartment building along Cocheco Street (Lot 24-113). Sub-watershed C consists of a small area on the southern border of the property and discharges to the abutter to the south, lot 24-111a. Sub-watershed D discharge directly to the west and Portland Avenue.

The site development includes the construction of four (4) 3,968 S.F. buildings, associated parking lots, 24' driveway, underground utilities and drainage facilities. Overall site disturbance is anticipated to be approximately 70,000± S.F.

The onsite drainage improvements have been designed to provide mitigation of both stormwater quantity and quality. All runoff from the proposed impervious portions of the site will be conveyed to the storage pipes through roof drains, catchbasins and porous pavement sections. The system has been designed to capture, treat and attenuate storm water flows from the full build out of the developed site prior to discharge and ultimately leading into the existing catch basin along Cocheco Street. Areas which discharge overland across property boundaries (sub-watersheds B, C, and D, have been mitigated to meet (neglible increase) or be below pre-development quantities.

The post development analysis is modeled using the same four (4) points of analysis developed for the pre-development model. The developed watershed has been further

divided into sub-catchments to accurately model post-development conditions, the drainage channels and the stormwater storage areas. The model represents the drainage design and the mitigation measures utilized while allowing direct comparison between pre and post development.

The analysis indicates that with the mitigation measures proposed and implemented there will be no measurable impact to the watershed as a result of the proposed development of the site.

2.0 DRAINAGE ANALYSIS

A comprehensive hydrologic study of this site has been performed utilizing nationally recognized runoff estimating techniques developed by the USDA, Soil Conservation Services (SCS). The technique and runoff models are described in various SCS publications and references as follows:

"Stormwater Management and Erosion Sediment Control Handbook for Urban and Developing Areas in New Hampshire"

"New Hampshire Stormwater Manual Volume 2 - Post-Construction Best Management Practices Selection & Design"

"Civil Engineering Reference Manual, Fifth Edition"

"Open-Channel Hydraulics" Chow.

"Stormwater Modeling System" HydroCAD Ver. 10.0

2.1 DRAINAGE DESIGN PARAMETERS

A brief review of the procedures and parameters used in the drainage study follows:

2.1.1 Watersheds

The watershed and sub-catchment areas were delineated using on-site topographic survey data from "Topographic Plan of Land prepared for Michael J. Spinelli Jr. Tax Map 24, Lot No. 114 87 Portland Avenue and Dean Street Holdings, Inc Tax Map 24, Lot No. 115B, Cocheco Street, City of Dover, County of Strafford, State of New Hampshire, dated December 26, 2017 prepared by McEneaney Survey Associates, Inc., and other publicly available sources.

CIVILWORKS NEW ENGLAND
181 WATSON ROAD
P.O. BOX 1166
DOVER, NH 03821-1166
PHONE: 603.749.0443 FAX: 603.749.7348

2.1.2 Soils

Onsite soil information used to estimate the runoff curve numbers was provided by National Cooperative Soil Survey for Strafford County, New Hampshire:

Hydrologic Drainage Class C/D: Buxton Silt Loam

Hydrologic Drainage Class C: Suffield Silt Loam

2.1.3 Rainfall Data

Extreme precipitation estimate values from the Northeast Regional Climate Center were utilized in this analysis. The analysis has been performed for the 2-year, 10-year, 25-year, and 50-year storm events with 3.15", 4.75", 6.01", and 7.18" rainfall depths respectively. The storage areas have been sized to accommodate the 50-yr storm event.

2.1.4 Runoff Curve Numbers

The SCS runoff curve numbers were used and are summarized within each subcatchment drainage summary in Appendix A.

2.2 EXISTING CONDTIONS

For purposes of this analysis the subject parcel was analyzed as 4 sub-watershed areas.

2.2.1 Table A – Existing Conditions (2, 10, 25, and 50-year storm events)

Watershed	**Pre-Development Volume (af)**	**Pre Development Peak Flows (cfs)**			
Point of Analysis	**2-yr**	**2-yr**	**10-yr**	**25-yr**	**50-yr**
A	0.37	2.6	4.8	6.7	8.4
B	0.007	0.1	0.2	0.2	0.3
C	0.006	0.1	0.1	0.2	0.2
D	0.012	0.1	0.2	0.3	0.4

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2.3 DEVELOPED CONDITIONS

The post development watershed was analyzed with 6 sub-watershed areas. Post development watersheds have the same summing points as the pre development analysis.

2.3.1 Table B – Developed Conditions (2, 10, 25, and 50-year storm events)

Watershed	**Post-Development Volume (af)**	**Post Development Peak Flows (cfs)**			
Point of Analysis	**2-yr**	**2-yr**	**10-yr**	**25-yr**	**50-yr**
A	0.515	2.6	4.7	6.7	8.4
B	0.011	0.1	0.2	0.3	0.3
C	0.002	0.0	0.1	0.1	0.1
D	0.016	0.2	0.3	0.4	0.4

Comparison Chart

Watershed	Pre/**Post-Development Volume (af)**	Pre/**Post Development Peak Flows (cfs)**			
	2-yr	**2-yr**	**10-yr**	**25-yr**	**50-yr**
A	0.37/**.515**	2.6/**2.6**	4.8/**4.7**	6.7/**6.7**	8.4/**8.4**
B	0.007/**0.011**	0.1/**0.1**	0.2/**0.2**	0.2/**0.3**	0.3/**0.3**
C	0.006/**.002**	0.1/**0.0**	0.1/**0.1**	0.2/**0.1**	0.2/**0.1**
D	0.012/**0.016**	0.1/**0.2**	0.2/**0.3**	0.3/**0.4**	0.4/**0.4**

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APPENDIX A

HYDROLOGIC CALCULATIONS

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	No
State	New Hampshire
Location	
Longitude	70.868 degrees West
Latitude	43.199 degrees North
Elevation	0 feet
Date/Time	Thu, 22 Mar 2018 11:20:23 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.49	0.66	0.81	1.00	**1yr**	0.70	0.98	1.13	1.59	2.02	2.60	2.87	**1yr**	2.31	2.76	3.16	3.89	4.45	**1yr**
2yr	0.32	0.49	0.61	0.82	1.01	1.19	**2yr**	0.88	1.17	1.39	1.86	2.41	3.15	3.51	**2yr**	2.79	3.38	3.87	4.61	5.24	**2yr**
5yr	0.37	0.57	0.70	0.96	1.23	1.48	**5yr**	1.06	1.44	1.72	2.32	2.96	3.98	4.50	**5yr**	3.53	4.33	4.95	5.82	6.57	**5yr**
10yr	0.41	0.63	0.79	1.10	1.42	1.73	**10yr**	1.23	1.69	2.02	2.73	3.47	4.75	5.43	**10yr**	4.21	5.22	5.96	6.94	7.81	**10yr**
25yr	0.48	0.74	0.92	1.31	1.72	2.14	**25yr**	1.49	2.09	2.51	3.39	4.27	6.01	6.96	**25yr**	5.32	6.70	7.63	8.78	9.80	**25yr**
50yr	0.55	0.83	1.04	1.49	2.00	2.52	**50yr**	1.73	2.46	2.95	4.00	5.01	7.18	8.41	**50yr**	6.35	8.09	9.21	10.49	11.65	**50yr**
100yr	0.62	0.94	1.18	1.70	2.33	2.96	**100yr**	2.01	2.89	3.48	4.72	5.87	8.58	10.16	**100yr**	7.59	9.77	11.11	12.54	13.86	**100yr**
200yr	0.70	1.06	1.34	1.94	2.71	3.48	**200yr**	2.34	3.40	4.10	5.57	6.88	10.26	12.28	**200yr**	9.08	11.81	13.40	14.99	16.48	**200yr**
500yr	0.84	1.25	1.60	2.33	3.31	4.32	**500yr**	2.86	4.22	5.09	6.94	8.50	12.99	15.78	**500yr**	11.50	15.18	17.19	19.00	20.75	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.24	0.37	0.45	0.60	0.74	0.90	**1yr**	0.64	0.88	0.92	1.26	1.58	2.14	2.45	**1yr**	1.90	2.36	2.88	3.36	4.03	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.18	**2yr**	0.86	1.16	1.36	1.83	2.35	3.04	3.40	**2yr**	2.69	3.27	3.75	4.47	5.05	**2yr**
5yr	0.35	0.54	0.67	0.91	1.16	1.40	**5yr**	1.00	1.37	1.61	2.15	2.77	3.71	4.13	**5yr**	3.29	3.97	4.62	5.41	6.11	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.81	2.44	3.12	4.27	4.78	**10yr**	3.78	4.60	5.32	6.24	7.01	**10yr**
25yr	0.44	0.66	0.83	1.18	1.55	1.91	**25yr**	1.34	1.87	2.11	2.83	3.64	4.92	5.78	**25yr**	4.36	5.56	6.49	7.54	8.41	**25yr**
50yr	0.48	0.73	0.91	1.31	1.76	2.19	**50yr**	1.52	2.14	2.35	3.19	4.09	5.61	6.67	**50yr**	4.97	6.41	7.53	8.69	9.64	**50yr**
100yr	0.54	0.81	1.01	1.47	2.01	2.51	**100yr**	1.73	2.45	2.63	3.56	4.56	6.38	7.68	**100yr**	5.65	7.38	8.73	10.03	11.04	**100yr**
200yr	0.59	0.89	1.13	1.64	2.29	2.87	**200yr**	1.97	2.80	2.93	3.99	5.09	7.26	8.84	**200yr**	6.42	8.50	10.12	11.57	12.66	**200yr**
500yr	0.69	1.03	1.33	1.93	2.74	3.45	**500yr**	2.36	3.37	3.40	4.61	5.89	8.57	10.64	**500yr**	7.58	10.23	12.29	13.99	15.12	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.71	0.87	1.08	**1yr**	0.75	1.05	1.24	1.74	2.21	2.88	3.10	**1yr**	2.55	2.98	3.44	4.23	4.82	**1yr**
2yr	0.33	0.51	0.62	0.85	1.04	1.25	**2yr**	0.90	1.22	1.47	1.95	2.51	3.30	3.64	**2yr**	2.92	3.50	4.01	4.76	5.46	**2yr**
5yr	0.39	0.61	0.75	1.03	1.31	1.58	**5yr**	1.13	1.55	1.86	2.50	3.20	4.25	4.87	**5yr**	3.76	4.68	5.29	6.25	7.01	**5yr**
10yr	0.46	0.70	0.87	1.22	1.57	1.92	**10yr**	1.36	1.88	2.24	3.05	3.86	5.22	6.08	**10yr**	4.62	5.85	6.69	7.67	8.55	**10yr**
25yr	0.56	0.85	1.05	1.50	1.98	2.48	**25yr**	1.71	2.43	2.88	3.97	4.97	7.09	8.18	**25yr**	6.28	7.86	8.97	10.10	11.15	**25yr**
50yr	0.64	0.98	1.22	1.75	2.36	3.00	**50yr**	2.04	2.93	3.50	4.83	6.03	8.76	10.25	**50yr**	7.75	9.86	11.22	12.42	13.63	**50yr**
100yr	0.75	1.13	1.42	2.05	2.81	3.63	**100yr**	2.43	3.54	4.24	5.92	7.34	10.83	12.86	**100yr**	9.58	12.36	14.02	15.31	16.68	**100yr**
200yr	0.87	1.31	1.66	2.40	3.35	4.40	**200yr**	2.89	4.30	5.16	7.24	8.92	13.42	16.14	**200yr**	11.88	15.52	17.55	18.85	20.43	**200yr**
500yr	1.07	1.58	2.04	2.96	4.21	5.65	**500yr**	3.64	5.52	6.67	9.47	11.57	17.84	21.80	**500yr**	15.79	20.96	23.63	24.86	26.74	**500yr**

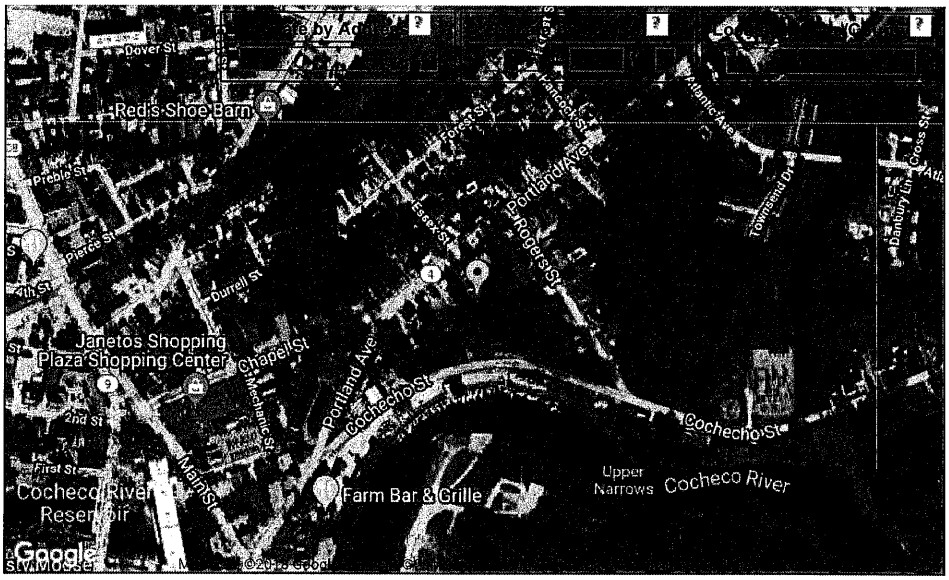
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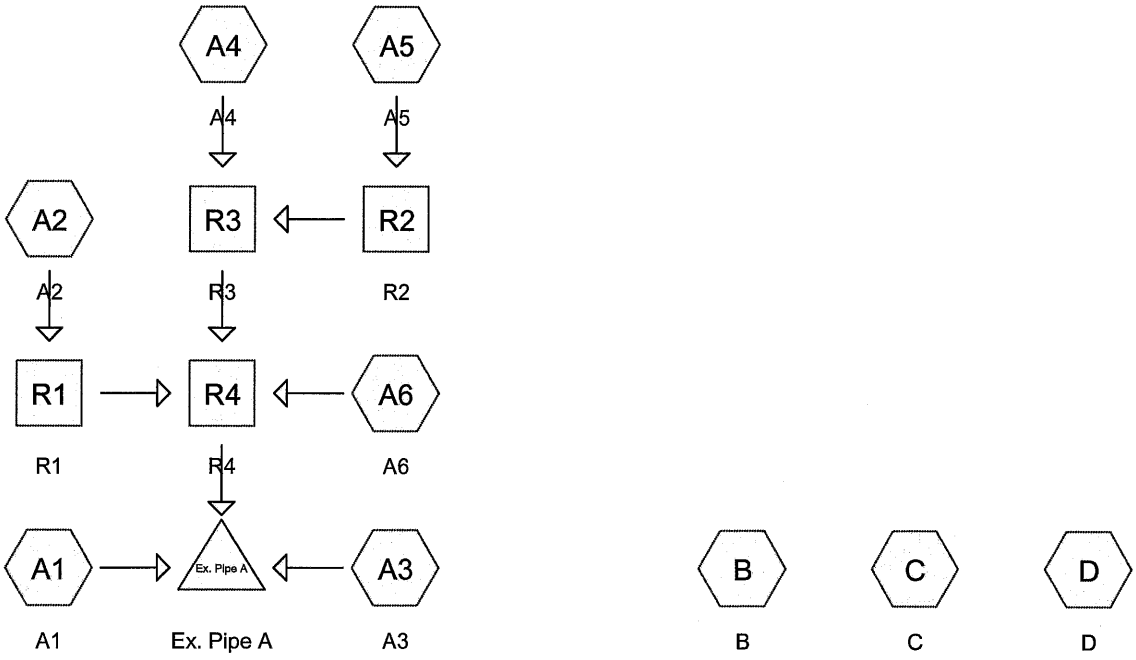
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This project is a joint collaboration between:
Northeast Regional Climate Center (NRCC) Cornell University
Natural Resources Conservation Service (NRCS) USDA NRCS

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EXISTING WATERSHEDS



Subcat Reach Pond Link

Routing Diagram for 1795 - Pre

Prepared by {enter your company name here}, Printed 6/25/2018

HydroCAD® 10.00 s/n 03240 © 2011 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
53,678	70	Woods, Good, HSG C (A1, A3, A4, A5, B)
27,097	74	>75% Grass cover, Good, HSG C (A1, A4, A5, A6, B, C, D)
4,071	77	Woods, Good, HSG D (A3, A4)
48,923	79	1 acre lots, 20% imp, HSG C (A2)
10,353	83	1/4 acre lots, 38% imp, HSG C (A2)
20,120	90	1/8 acre lots, 65% imp, HSG C (A2, A4)
2,734	98	Paved parking, HSG C (A5, C, D)
4,005	98	Unconnected roofs, HSG C (A4, A5, A6, C, D)
170,981	**78**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
166,910	HSG C	A1, A2, A3, A4, A5, A6, B, C, D
4,071	HSG D	A3, A4
0	Other	
170,981		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
0	0	27,097	0	0	27,097	>75% Grass cover, Good	
0	0	2,734	0	0	2,734	Paved parking	
0	0	4,005	0	0	4,005	Unconnected roofs	
0	0	20,120	0	0	20,120	1/8 acre lots, 65% imp	
0	0	10,353	0	0	10,353	1/4 acre lots, 38% imp	
0	0	48,923	0	0	48,923	1 acre lots, 20% imp	
0	0	53,678	4,071	0	57,749	Woods, Good	
0	**0**	**166,910**	**4,071**	**0**	**170,981**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	Ex. Pipe A	17.92	17.50	4.0	0.1050	0.012	12.0	0.0	0.0

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A – 1

NODE LISTING – 2-YR

Time span=0.00-26.00 hrs, dt=0.01 hrs, 2601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A1: A1 Runoff Area=5,685 sf 0.00% Impervious Runoff Depth=0.85"
Flow Length=219' Tc=7.8 min CN=71 Runoff=0.1 cfs 402 cf

Subcatchment A2: A2 Runoff Area=69,947 sf 29.53% Impervious Runoff Depth=1.43"
Flow Length=440' Tc=19.5 min CN=81 Runoff=1.5 cfs 8,334 cf

Subcatchment A3: A3 Runoff Area=9,221 sf 0.00% Impervious Runoff Depth=0.95"
Flow Length=185' Tc=6.0 min CN=73 Runoff=0.2 cfs 731 cf

Subcatchment A4: A4 Runoff Area=49,460 sf 14.07% Impervious Runoff Depth=1.06"
Flow Length=474' Tc=26.2 min CN=75 Runoff=0.7 cfs 4,370 cf

Subcatchment A5: A5 Runoff Area=18,276 sf 17.42% Impervious Runoff Depth=1.12"
Flow Length=313' Tc=15.7 min UI Adjusted CN=76 Runoff=0.3 cfs 1,702 cf

Subcatchment A6: A6 Runoff Area=6,605 sf 15.05% Impervious Runoff Depth=1.12"
Flow Length=144' Tc=7.0 min UI Adjusted CN=76 Runoff=0.2 cfs 615 cf

Subcatchment B: B Runoff Area=4,269 sf 0.00% Impervious Runoff Depth=0.85"
Flow Length=179' Tc=8.9 min CN=71 Runoff=0.1 cfs 302 cf

Subcatchment C: C Runoff Area=2,698 sf 12.31% Impervious Runoff Depth=1.12"
Flow Length=29' Slope=0.0100 '/' Tc=7.0 min UI Adjusted CN=76 Runoff=0.1 cfs 251 cf

Subcatchment D: D Runoff Area=4,820 sf 29.25% Impervious Runoff Depth=1.30"
Flow Length=49' Slope=0.0100 '/' Tc=10.7 min UI Adjusted CN=79 Runoff=0.1 cfs 522 cf

Reach R1: R1 Avg. Flow Depth=0.30' Max Vel=4.02 fps Inflow=1.5 cfs 8,334 cf
n=0.040 L=90.0' S=0.1083 '/' Capacity=19.4 cfs Outflow=1.5 cfs 8,334 cf

Reach R2: R2 Avg. Flow Depth=0.16' Max Vel=2.28 fps Inflow=0.3 cfs 1,702 cf
n=0.040 L=141.0' S=0.0787 '/' Capacity=16.6 cfs Outflow=0.3 cfs 1,702 cf

Reach R3: R3 Avg. Flow Depth=0.32' Max Vel=2.20 fps Inflow=0.9 cfs 6,072 cf
n=0.040 L=5.0' S=0.0300 '/' Capacity=10.2 cfs Outflow=0.9 cfs 6,072 cf

Reach R4: R4 Avg. Flow Depth=0.49' Max Vel=3.11 fps Inflow=2.5 cfs 15,021 cf
n=0.040 L=50.0' S=0.0350 '/' Capacity=11.0 cfs Outflow=2.5 cfs 15,021 cf

Pond Ex. Pipe A: Ex. Pipe A Peak Elev=18.91' Storage=46 cf Inflow=2.7 cfs 16,153 cf
Primary=2.6 cfs 16,153 cf Secondary=0.0 cfs 0 cf Outflow=2.6 cfs 16,153 cf

Total Runoff Area = 170,981 sf Runoff Volume = 17,228 cf Average Runoff Depth = 1.21"
80.39% Pervious = 137,445 sf 19.61% Impervious = 33,536 sf

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A – 1

NODE LISTING – 10-YR

Time span=0.00-26.00 hrs, dt=0.01 hrs, 2601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A1: A1 Runoff Area=5,685 sf 0.00% Impervious Runoff Depth=1.93"
Flow Length=219' Tc=7.8 min CN=71 Runoff=0.2 cfs 914 cf

Subcatchment A2: A2 Runoff Area=69,947 sf 29.53% Impervious Runoff Depth=2.77"
Flow Length=440' Tc=19.5 min CN=81 Runoff=2.7 cfs 16,120 cf

Subcatchment A3: A3 Runoff Area=9,221 sf 0.00% Impervious Runoff Depth=2.09"
Flow Length=185' Tc=6.0 min CN=73 Runoff=0.4 cfs 1,603 cf

Subcatchment A4: A4 Runoff Area=49,460 sf 14.07% Impervious Runoff Depth=2.25"
Flow Length=474' Tc=26.2 min CN=75 Runoff=1.3 cfs 9,266 cf

Subcatchment A5: A5 Runoff Area=18,276 sf 17.42% Impervious Runoff Depth=2.33"
Flow Length=313' Tc=15.7 min UI Adjusted CN=76 Runoff=0.7 cfs 3,550 cf

Subcatchment A6: A6 Runoff Area=6,605 sf 15.05% Impervious Runoff Depth=2.33"
Flow Length=144' Tc=7.0 min UI Adjusted CN=76 Runoff=0.3 cfs 1,283 cf

Subcatchment B: B Runoff Area=4,269 sf 0.00% Impervious Runoff Depth=1.93"
Flow Length=179' Tc=8.9 min CN=71 Runoff=0.2 cfs 686 cf

Subcatchment C: C Runoff Area=2,698 sf 12.31% Impervious Runoff Depth=2.33"
Flow Length=29' Slope=0.0100 '/' Tc=7.0 min UI Adjusted CN=76 Runoff=0.1 cfs 524 cf

Subcatchment D: D Runoff Area=4,820 sf 29.25% Impervious Runoff Depth=2.59"
Flow Length=49' Slope=0.0100 '/' Tc=10.7 min UI Adjusted CN=79 Runoff=0.2 cfs 1,039 cf

Reach R1: R1 Avg. Flow Depth=0.39' Max Vel=4.74 fps Inflow=2.7 cfs 16,120 cf
n=0.040 L=90.0' S=0.1083 '/' Capacity=19.4 cfs Outflow=2.7 cfs 16,120 cf

Reach R2: R2 Avg. Flow Depth=0.22' Max Vel=2.78 fps Inflow=0.7 cfs 3,550 cf
n=0.040 L=141.0' S=0.0787 '/' Capacity=16.6 cfs Outflow=0.7 cfs 3,550 cf

Reach R3: R3 Avg. Flow Depth=0.44' Max Vel=2.70 fps Inflow=1.9 cfs 12,816 cf
n=0.040 L=5.0' S=0.0300 '/' Capacity=10.2 cfs Outflow=1.9 cfs 12,816 cf

Reach R4: R4 Avg. Flow Depth=0.66' Max Vel=3.72 fps Inflow=4.7 cfs 30,219 cf
n=0.040 L=50.0' S=0.0350 '/' Capacity=11.0 cfs Outflow=4.7 cfs 30,219 cf

Pond Ex. Pipe A: Ex. Pipe A Peak Elev=20.05' Storage=263 cf Inflow=5.0 cfs 32,736 cf
Primary=4.8 cfs 32,736 cf Secondary=0.0 cfs 0 cf Outflow=4.8 cfs 32,736 cf

Total Runoff Area = 170,981 sf Runoff Volume = 34,986 cf Average Runoff Depth = 2.46"
80.39% Pervious = 137,445 sf 19.61% Impervious = 33,536 sf

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A – 1

NODE LISTING – 25-YR

Time span=0.00-26.00 hrs, dt=0.01 hrs, 2601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentA1: A1 Runoff Area=5,685 sf 0.00% Impervious Runoff Depth=2.91"
Flow Length=219' Tc=7.8 min CN=71 Runoff=0.3 cfs 1,377 cf

SubcatchmentA2: A2 Runoff Area=69,947 sf 29.53% Impervious Runoff Depth=3.89"
Flow Length=440' Tc=19.5 min CN=81 Runoff=3.6 cfs 22,691 cf

SubcatchmentA3: A3 Runoff Area=9,221 sf 0.00% Impervious Runoff Depth=3.10"
Flow Length=185' Tc=6.0 min CN=73 Runoff=0.6 cfs 2,380 cf

SubcatchmentA4: A4 Runoff Area=49,460 sf 14.07% Impervious Runoff Depth=3.29"
Flow Length=474' Tc=26.2 min CN=75 Runoff=1.9 cfs 13,563 cf

SubcatchmentA5: A5 Runoff Area=18,276 sf 17.42% Impervious Runoff Depth=3.39"
Flow Length=313' Tc=15.7 min UI Adjusted CN=76 Runoff=0.9 cfs 5,161 cf

SubcatchmentA6: A6 Runoff Area=6,605 sf 15.05% Impervious Runoff Depth=3.39"
Flow Length=144' Tc=7.0 min UI Adjusted CN=76 Runoff=0.4 cfs 1,865 cf

SubcatchmentB: B Runoff Area=4,269 sf 0.00% Impervious Runoff Depth=2.91"
Flow Length=179' Tc=8.9 min CN=71 Runoff=0.2 cfs 1,034 cf

SubcatchmentC: C Runoff Area=2,698 sf 12.31% Impervious Runoff Depth=3.39"
Flow Length=29' Slope=0.0100 '/' Tc=7.0 min UI Adjusted CN=76 Runoff=0.2 cfs 762 cf

SubcatchmentD: D Runoff Area=4,820 sf 29.25% Impervious Runoff Depth=3.69"
Flow Length=49' Slope=0.0100 '/' Tc=10.7 min UI Adjusted CN=79 Runoff=0.3 cfs 1,482 cf

Reach R1: R1 Avg. Flow Depth=0.45' Max Vel=5.14 fps Inflow=3.6 cfs 22,691 cf
n=0.040 L=90.0' S=0.1083 '/' Capacity=19.4 cfs Outflow=3.6 cfs 22,691 cf

Reach R2: R2 Avg. Flow Depth=0.25' Max Vel=3.06 fps Inflow=0.9 cfs 5,161 cf
n=0.040 L=141.0' S=0.0787 '/' Capacity=16.6 cfs Outflow=0.9 cfs 5,161 cf

Reach R3: R3 Avg. Flow Depth=0.52' Max Vel=2.97 fps Inflow=2.6 cfs 18,724 cf
n=0.040 L=5.0' S=0.0300 '/' Capacity=10.2 cfs Outflow=2.6 cfs 18,724 cf

Reach R4: R4 Avg. Flow Depth=0.77' Max Vel=4.05 fps Inflow=6.3 cfs 43,280 cf
n=0.040 L=50.0' S=0.0350 '/' Capacity=11.0 cfs Outflow=6.3 cfs 43,280 cf

Pond Ex. Pipe A: Ex. Pipe A Peak Elev=20.27' Storage=366 cf Inflow=6.7 cfs 47,037 cf
Primary=5.1 cfs 45,844 cf Secondary=1.6 cfs 1,193 cf Outflow=6.7 cfs 47,037 cf

Total Runoff Area = 170,981 sf Runoff Volume = 50,314 cf Average Runoff Depth = 3.53"
80.39% Pervious = 137,445 sf 19.61% Impervious = 33,536 sf

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NODE LISTING – 50-YR

Time span=0.00-26.00 hrs, dt=0.01 hrs, 2601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A1: A1 Runoff Area=5,685 sf 0.00% Impervious Runoff Depth=3.88"
Flow Length=219' Tc=7.8 min CN=71 Runoff=0.4 cfs 1,836 cf

Subcatchment A2: A2 Runoff Area=69,947 sf 29.53% Impervious Runoff Depth=4.97"
Flow Length=440' Tc=19.5 min CN=81 Runoff=4.4 cfs 28,986 cf

Subcatchment A3: A3 Runoff Area=9,221 sf 0.00% Impervious Runoff Depth=4.09"
Flow Length=185' Tc=6.0 min CN=73 Runoff=0.8 cfs 3,144 cf

Subcatchment A4: A4 Runoff Area=49,460 sf 14.07% Impervious Runoff Depth=4.31"
Flow Length=474' Tc=26.2 min CN=75 Runoff=2.4 cfs 17,758 cf

Subcatchment A5: A5 Runoff Area=18,276 sf 17.42% Impervious Runoff Depth=4.42"
Flow Length=313' Tc=15.7 min UI Adjusted CN=76 Runoff=1.1 cfs 6,729 cf

Subcatchment A6: A6 Runoff Area=6,605 sf 15.05% Impervious Runoff Depth=4.42"
Flow Length=144' Tc=7.0 min UI Adjusted CN=76 Runoff=0.6 cfs 2,432 cf

Subcatchment B: B Runoff Area=4,269 sf 0.00% Impervious Runoff Depth=3.88"
Flow Length=179' Tc=8.9 min CN=71 Runoff=0.3 cfs 1,379 cf

Subcatchment C: C Runoff Area=2,698 sf 12.31% Impervious Runoff Depth=4.42"
Flow Length=29' Slope=0.0100 '/' Tc=7.0 min UI Adjusted CN=76 Runoff=0.2 cfs 993 cf

Subcatchment D: D Runoff Area=4,820 sf 29.25% Impervious Runoff Depth=4.75"
Flow Length=49' Slope=0.0100 '/' Tc=10.7 min UI Adjusted CN=79 Runoff=0.4 cfs 1,908 cf

Reach R1: R1 Avg. Flow Depth=0.49' Max Vel=5.46 fps Inflow=4.4 cfs 28,986 cf
n=0.040 L=90.0' S=0.1083 '/' Capacity=19.4 cfs Outflow=4.4 cfs 28,986 cf

Reach R2: R2 Avg. Flow Depth=0.28' Max Vel=3.28 fps Inflow=1.1 cfs 6,729 cf
n=0.040 L=141.0' S=0.0787 '/' Capacity=16.6 cfs Outflow=1.1 cfs 6,729 cf

Reach R3: R3 Avg. Flow Depth=0.58' Max Vel=3.18 fps Inflow=3.3 cfs 24,486 cf
n=0.040 L=5.0' S=0.0300 '/' Capacity=10.2 cfs Outflow=3.3 cfs 24,486 cf

Reach R4: R4 Avg. Flow Depth=0.85' Max Vel=4.31 fps Inflow=7.9 cfs 55,904 cf
n=0.040 L=50.0' S=0.0350 '/' Capacity=11.0 cfs Outflow=7.9 cfs 55,904 cf

Pond Ex. Pipe A: Ex. Pipe A Peak Elev=20.36' Storage=431 cf Inflow=8.4 cfs 60,883 cf
Primary=5.3 cfs 57,597 cf Secondary=3.1 cfs 3,286 cf Outflow=8.4 cfs 60,883 cf

Total Runoff Area = 170,981 sf Runoff Volume = 65,163 cf Average Runoff Depth = 4.57"
80.39% Pervious = 137,445 sf 19.61% Impervious = 33,536 sf

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A – 1

10-YR STORM SUMMARY

Summary for Subcatchment A1: A1

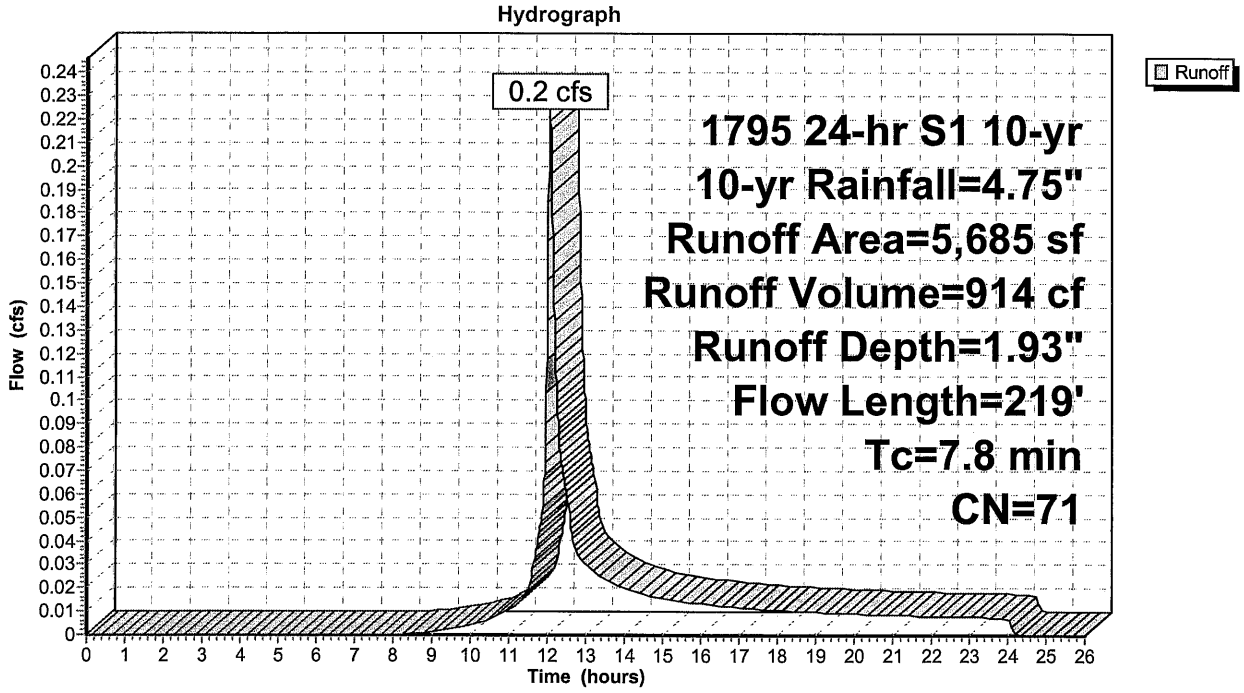
Runoff = 0.2 cfs @ 12.06 hrs, Volume= 914 cf, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
4,467	70	Woods, Good, HSG C
1,218	74	>75% Grass cover, Good, HSG C
5,685	71	Weighted Average
5,685		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	75	0.2000	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.15"
0.2	39	0.3590	3.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	105	0.0900	2.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.8	219	Total			

Subcatchment A1: A1



Summary for Subcatchment A2: A2

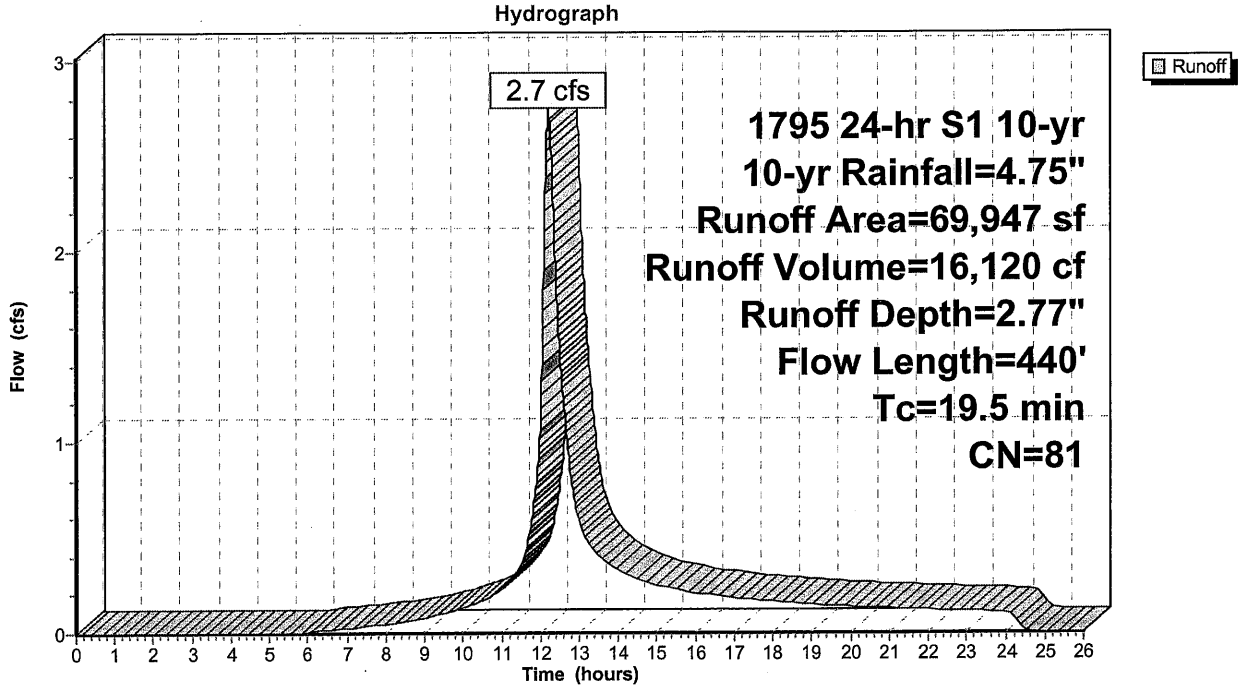
Runoff = 2.7 cfs @ 12.22 hrs, Volume= 16,120 cf, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
48,923	79	1 acre lots, 20% imp, HSG C
10,353	83	1/4 acre lots, 38% imp, HSG C
10,671	90	1/8 acre lots, 65% imp, HSG C
69,947	81	Weighted Average
49,292		70.47% Pervious Area
20,655		29.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	100	0.0150	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
3.4	340	0.1100	1.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
19.5	440	Total			

Subcatchment A2: A2



Summary for Subcatchment A3: A3

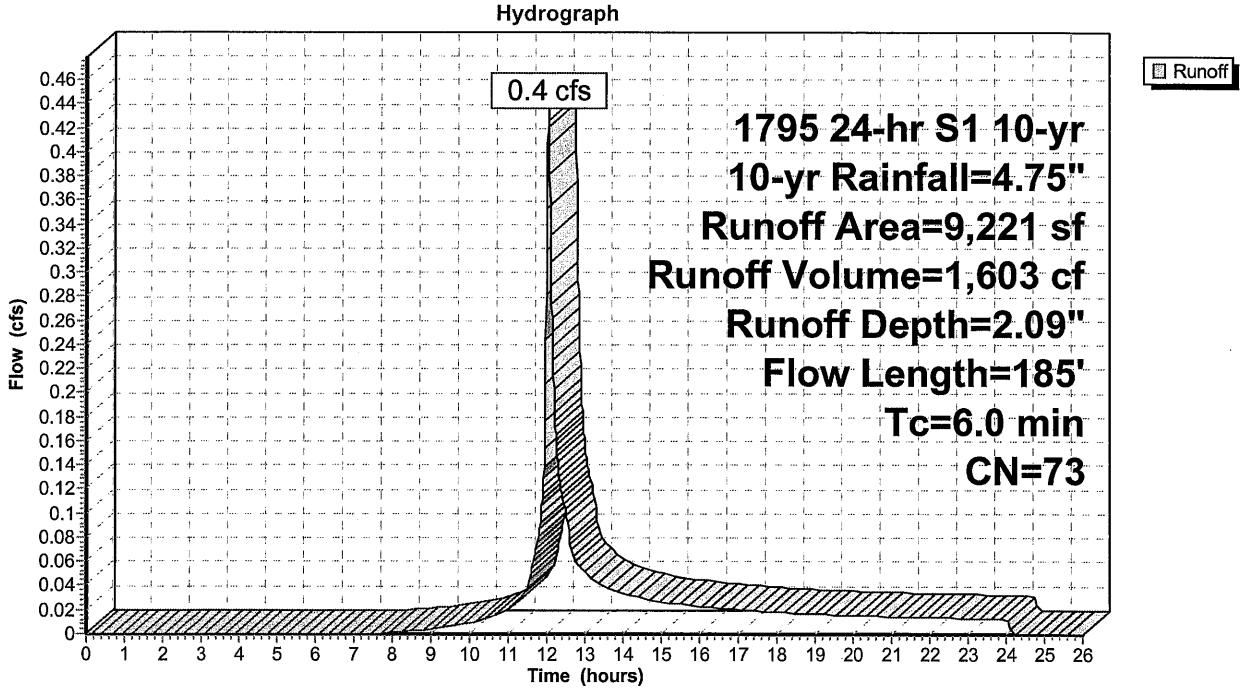
Runoff = 0.4 cfs @ 12.04 hrs, Volume= 1,603 cf, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
5,821	70	Woods, Good, HSG C
3,400	77	Woods, Good, HSG D
9,221	73	Weighted Average
9,221		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	61	0.2050	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.15"
0.3	124	0.1010	7.78	15.57	**Parabolic Channel,** W=3.00' D=1.00' Area=2.0 sf Perim=3.7' n= 0.040 Winding stream, pools & shoals
6.0	185	Total			

Subcatchment A3: A3



Summary for Subcatchment A4: A4

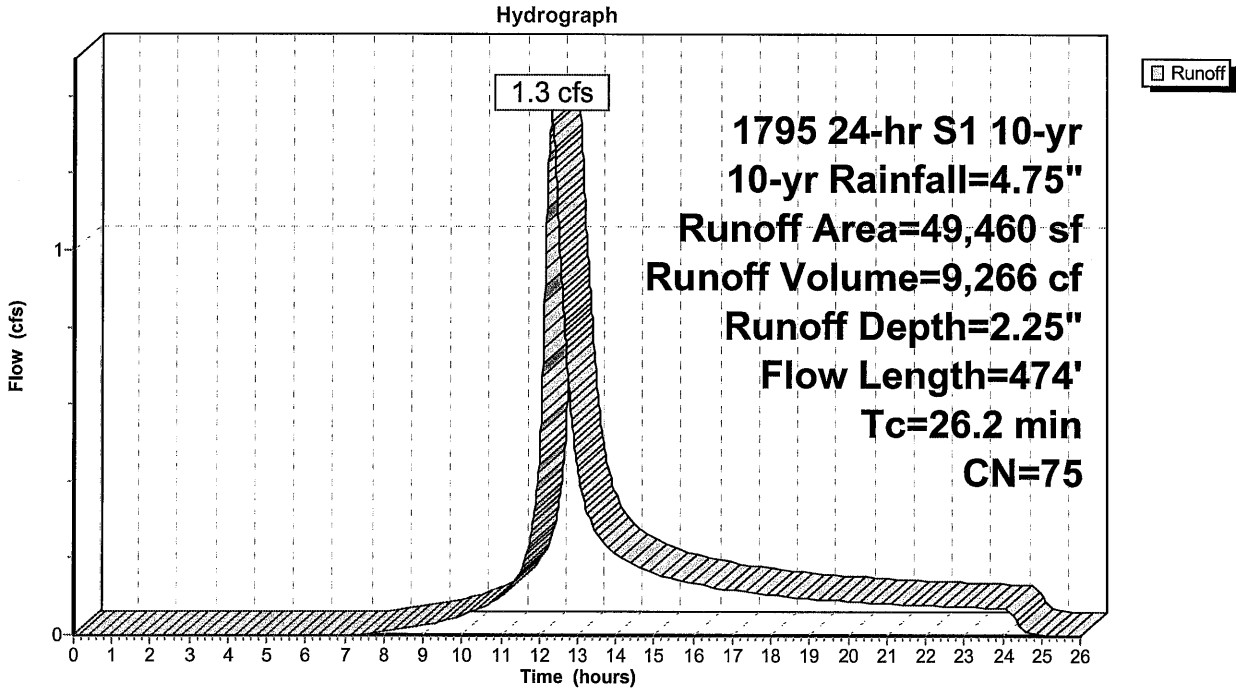
Runoff = 1.3 cfs @ 12.31 hrs, Volume= 9,266 cf, Depth= 2.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
33,034	70	Woods, Good, HSG C
5,487	74	>75% Grass cover, Good, HSG C
9,449	90	1/8 acre lots, 65% imp, HSG C
819	98	Unconnected roofs, HSG C
671	77	Woods, Good, HSG D
49,460	75	Weighted Average
42,499		85.93% Pervious Area
6,961		14.07% Impervious Area
819		11.77% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	23	0.0150	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
18.5	80	0.0190	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.15"
2.5	280	0.1380	1.86		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	91	0.1040	7.90	15.80	**Parabolic Channel,** W=3.00' D=1.00' Area=2.0 sf Perim=3.7' n= 0.040 Winding stream, pools & shoals
26.2	474	Total			

Subcatchment A4: A4



Summary for Subcatchment A5: A5

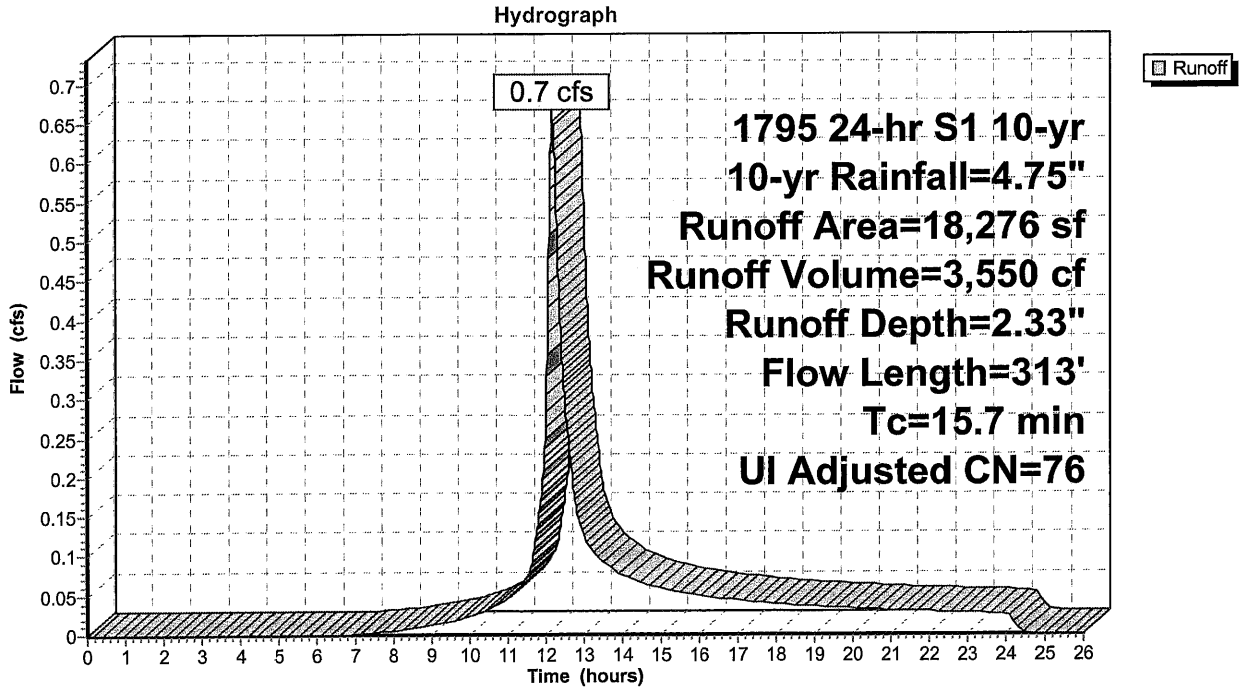
Runoff = 0.7 cfs @ 12.17 hrs, Volume= 3,550 cf, Depth= 2.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
7,090	70	Woods, Good, HSG C
8,002	74	>75% Grass cover, Good, HSG C
1,295	98	Unconnected roofs, HSG C
1,889	98	Paved parking, HSG C
18,276	77	Weighted Average, UI Adjusted CN = 76
15,092		82.58% Pervious Area
3,184		17.42% Impervious Area
1,295		40.67% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6	100	0.0230	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
1.1	67	0.0220	1.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	146	0.2430	2.46		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.7	313	Total			

Subcatchment A5: A5



Summary for Subcatchment A6: A6

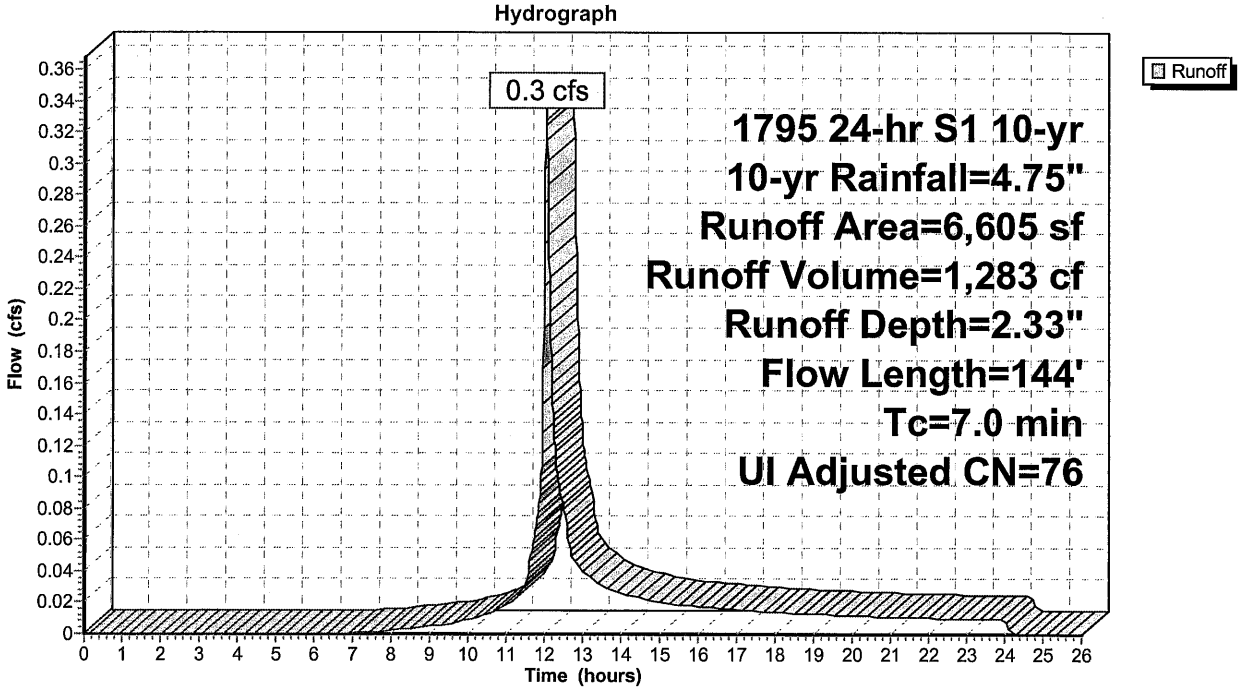
Runoff = 0.3 cfs @ 12.05 hrs, Volume= 1,283 cf, Depth= 2.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
5,611	74	>75% Grass cover, Good, HSG C
994	98	Unconnected roofs, HSG C
6,605	78	Weighted Average, UI Adjusted CN = 76
5,611		84.95% Pervious Area
994		15.05% Impervious Area
994		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.1380	0.25		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
0.4	44	0.0570	1.67		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.0	144	Total			

Subcatchment A6: A6



Summary for Subcatchment B: B

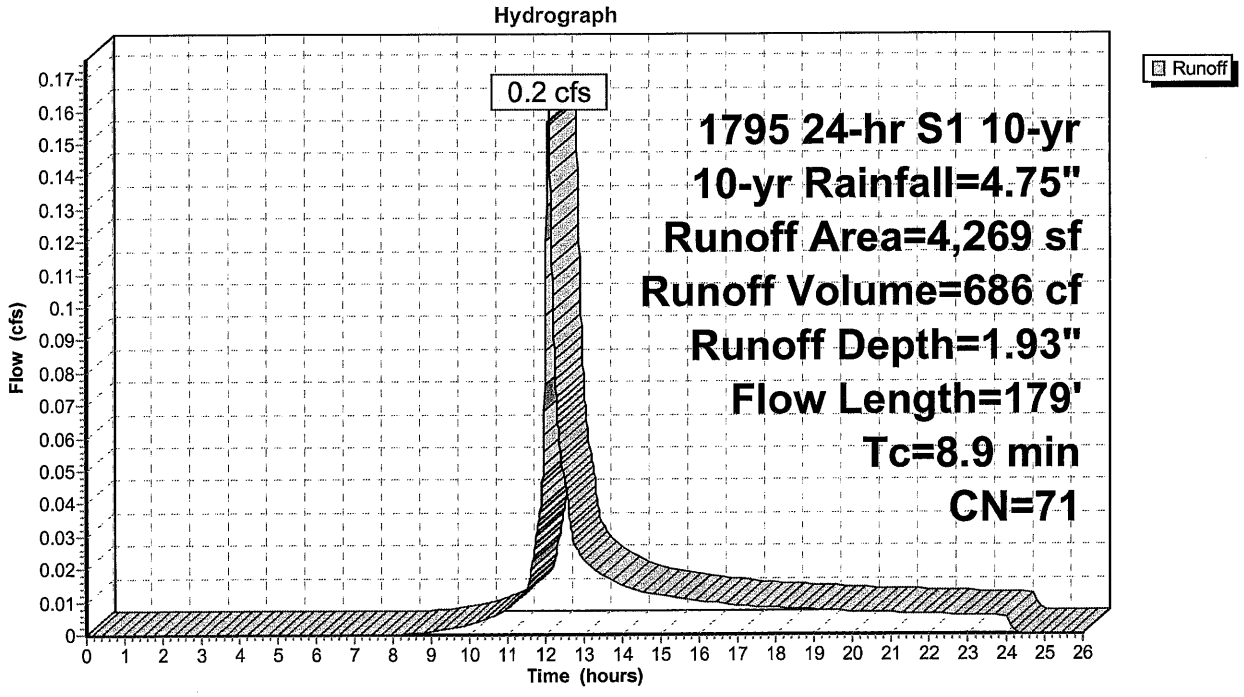
Runoff = 0.2 cfs @ 12.08 hrs, Volume= 686 cf, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
3,266	70	Woods, Good, HSG C
1,003	74	>75% Grass cover, Good, HSG C
4,269	71	Weighted Average
4,269		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	62	0.0320	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
0.8	117	0.2590	2.54		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.9	179	Total			

Subcatchment B: B



Summary for Subcatchment C: C

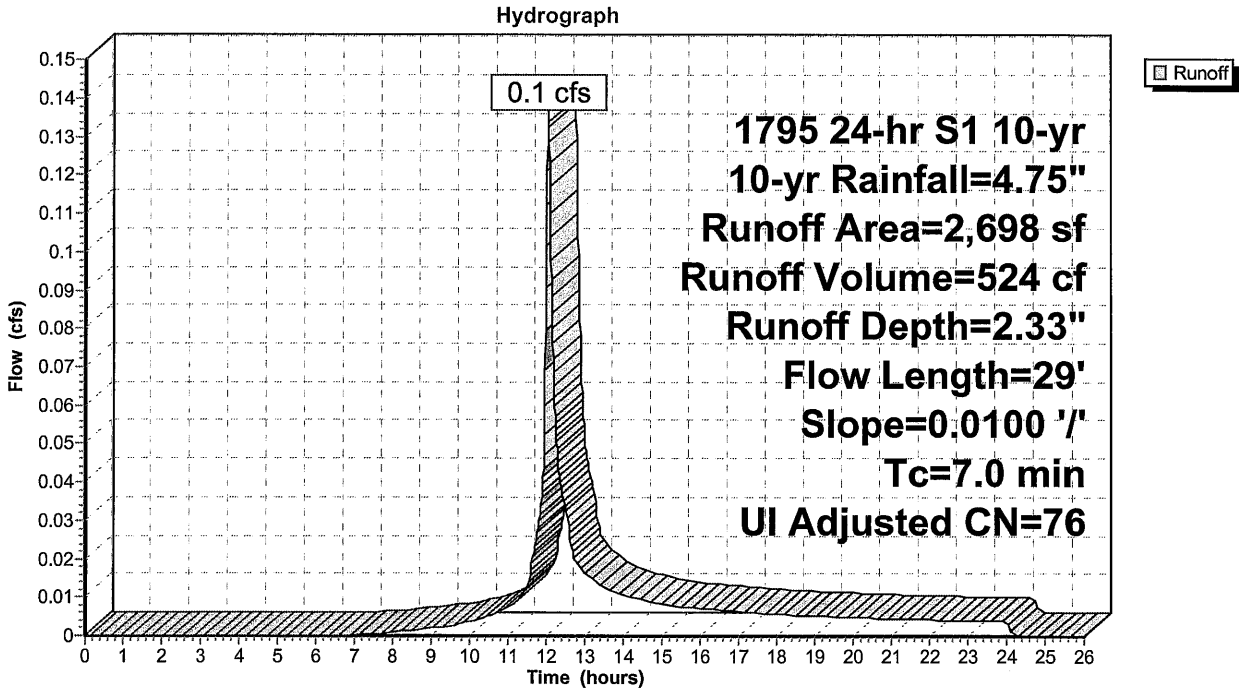
Runoff = 0.1 cfs @ 12.05 hrs, Volume= 524 cf, Depth= 2.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
2,366	74	>75% Grass cover, Good, HSG C
115	98	Unconnected roofs, HSG C
217	98	Paved parking, HSG C
2,698	77	Weighted Average, UI Adjusted CN = 76
2,366		87.69% Pervious Area
332		12.31% Impervious Area
115		34.64% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	29	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"

Subcatchment C: C



Summary for Subcatchment D: D

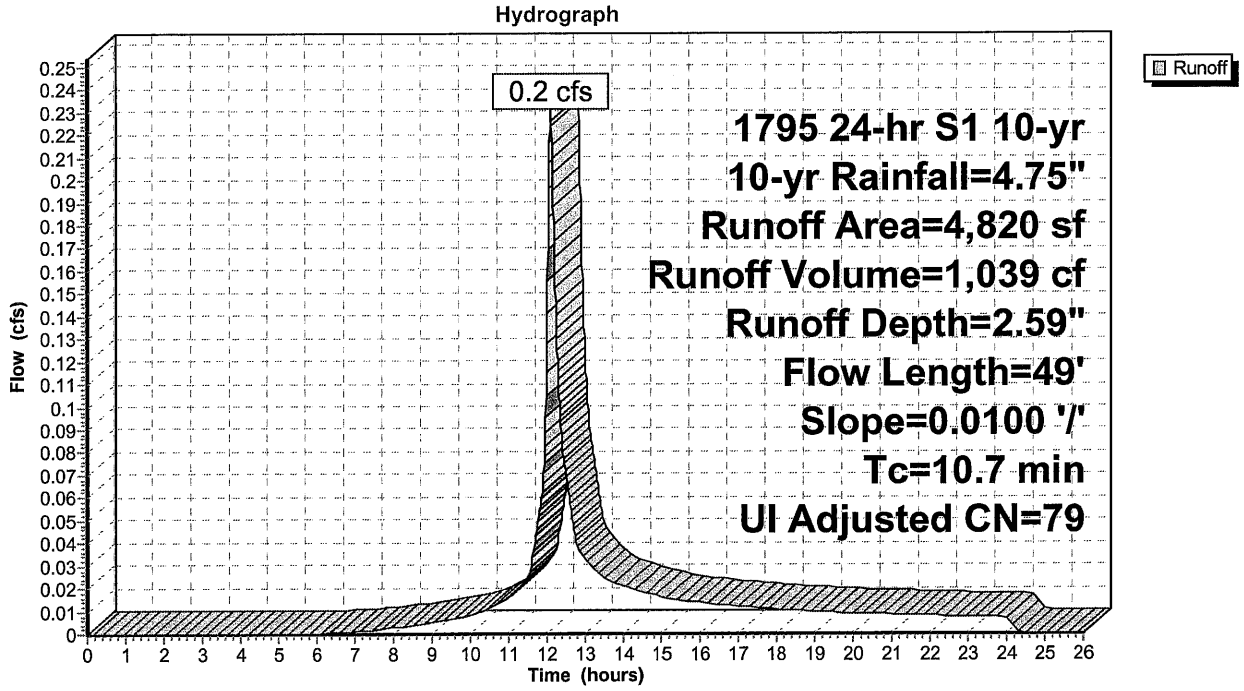
Runoff = 0.2 cfs @ 12.10 hrs, Volume= 1,039 cf, Depth= 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
3,410	74	>75% Grass cover, Good, HSG C
782	98	Unconnected roofs, HSG C
628	98	Paved parking, HSG C
4,820	81	Weighted Average, UI Adjusted CN = 79
3,410		70.75% Pervious Area
1,410		29.25% Impervious Area
782		55.46% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	49	0.0100	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"

Subcatchment D: D



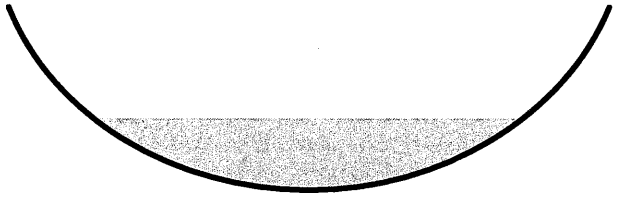
Summary for Reach R1: R1

Inflow Area = 69,947 sf, 29.53% Impervious, Inflow Depth = 2.77" for 10-yr event
Inflow = 2.7 cfs @ 12.22 hrs, Volume= 16,120 cf
Outflow = 2.7 cfs @ 12.22 hrs, Volume= 16,120 cf, Atten= 0%, Lag= 0.1 min

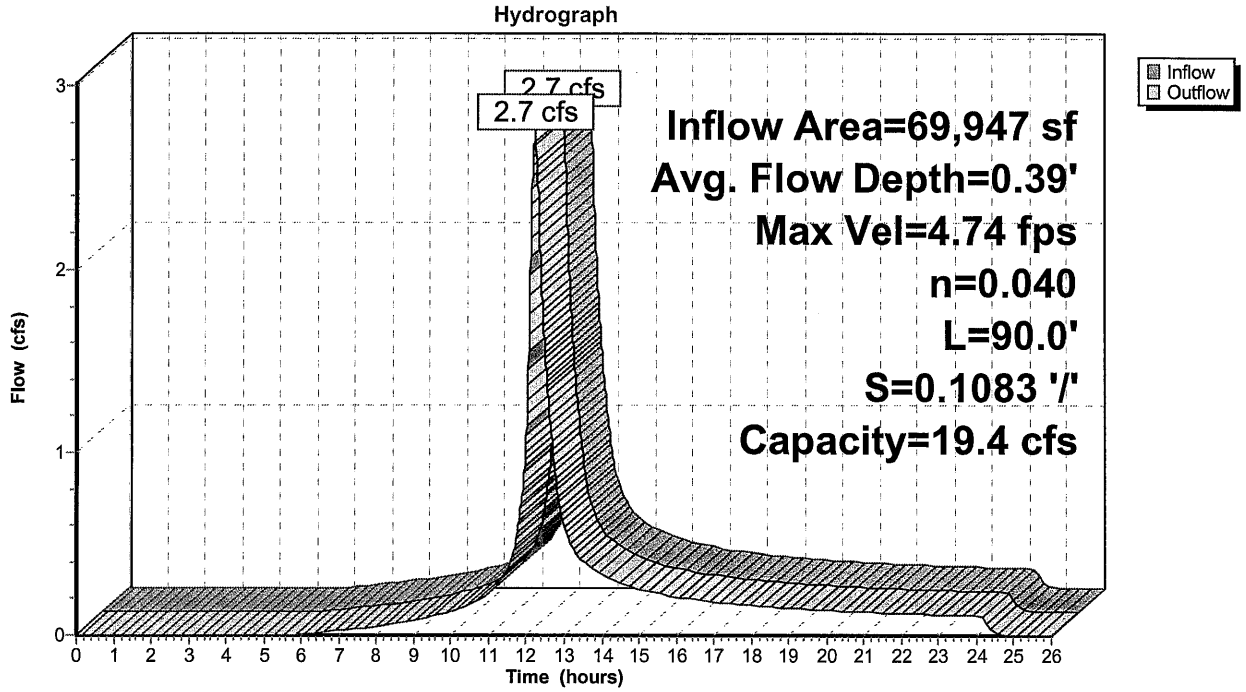
Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.74 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.98 fps, Avg. Travel Time= 0.8 min

Peak Storage= 51 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 1.00' Flow Area= 2.3 sf, Capacity= 19.4 cfs

3.50' x 1.00' deep Parabolic Channel, n= 0.040 Winding stream, pools & shoals
Length= 90.0' Slope= 0.1083 '/'
Inlet Invert= 31.50', Outlet Invert= 21.75'



Reach R1: R1



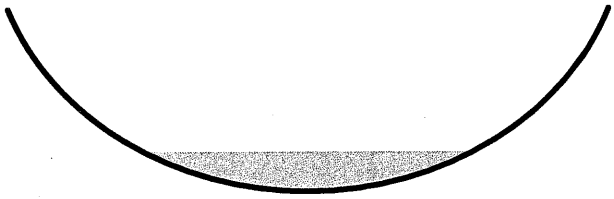
Summary for Reach R2: R2

Inflow Area = 18,276 sf, 17.42% Impervious, Inflow Depth = 2.33" for 10-yr event
Inflow = 0.7 cfs @ 12.17 hrs, Volume= 3,550 cf
Outflow = 0.7 cfs @ 12.18 hrs, Volume= 3,550 cf, Atten= 0%, Lag= 0.8 min

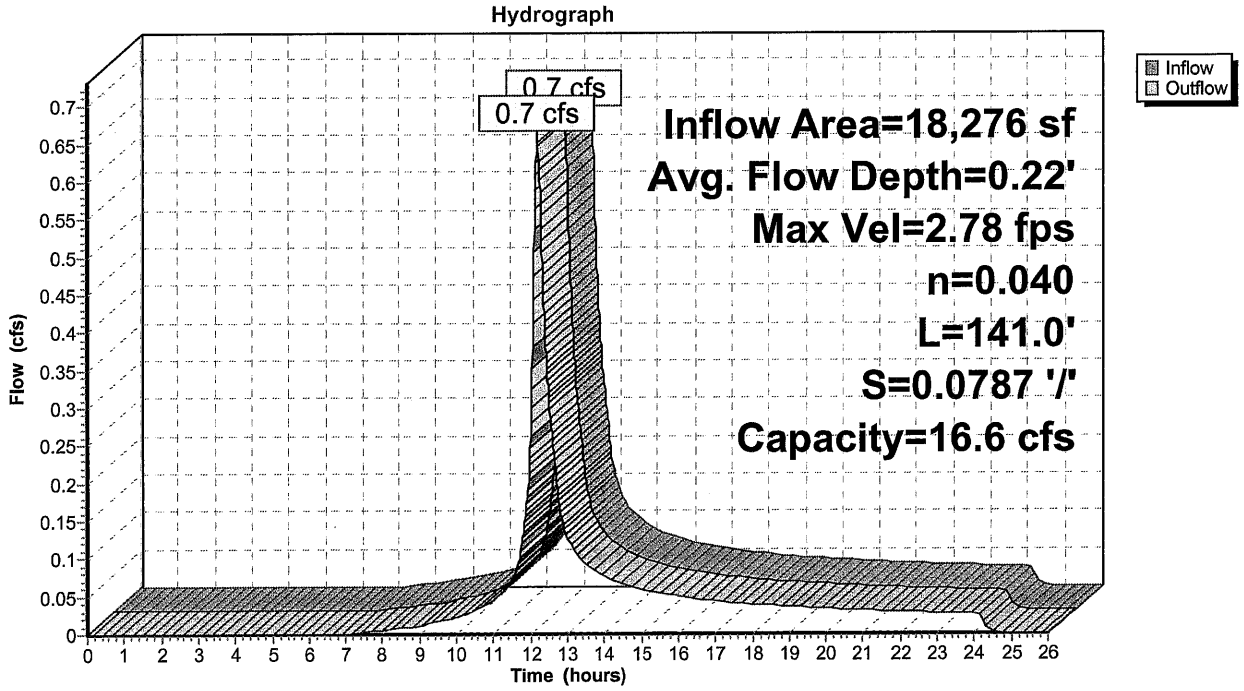
Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.78 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 2.0 min

Peak Storage= 33 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 2.3 sf, Capacity= 16.6 cfs

3.50' x 1.00' deep Parabolic Channel, n= 0.040 Winding stream, pools & shoals
Length= 141.0' Slope= 0.0787 '/'
Inlet Invert= 33.00', Outlet Invert= 21.90'



Reach R2: R2



Summary for Reach R3: R3

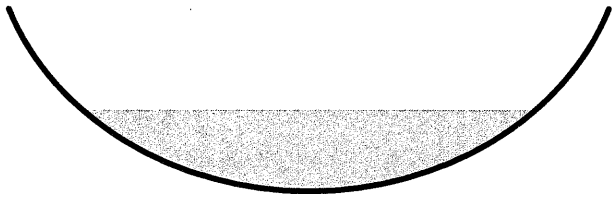
[62] Hint: Exceeded Reach R2 OUTLET depth by 0.25' @ 12.35 hrs

Inflow Area = 67,736 sf, 14.98% Impervious, Inflow Depth = 2.27" for 10-yr event
Inflow = 1.9 cfs @ 12.26 hrs, Volume= 12,816 cf
Outflow = 1.9 cfs @ 12.26 hrs, Volume= 12,816 cf, Atten= 0%, Lag= 0.0 min

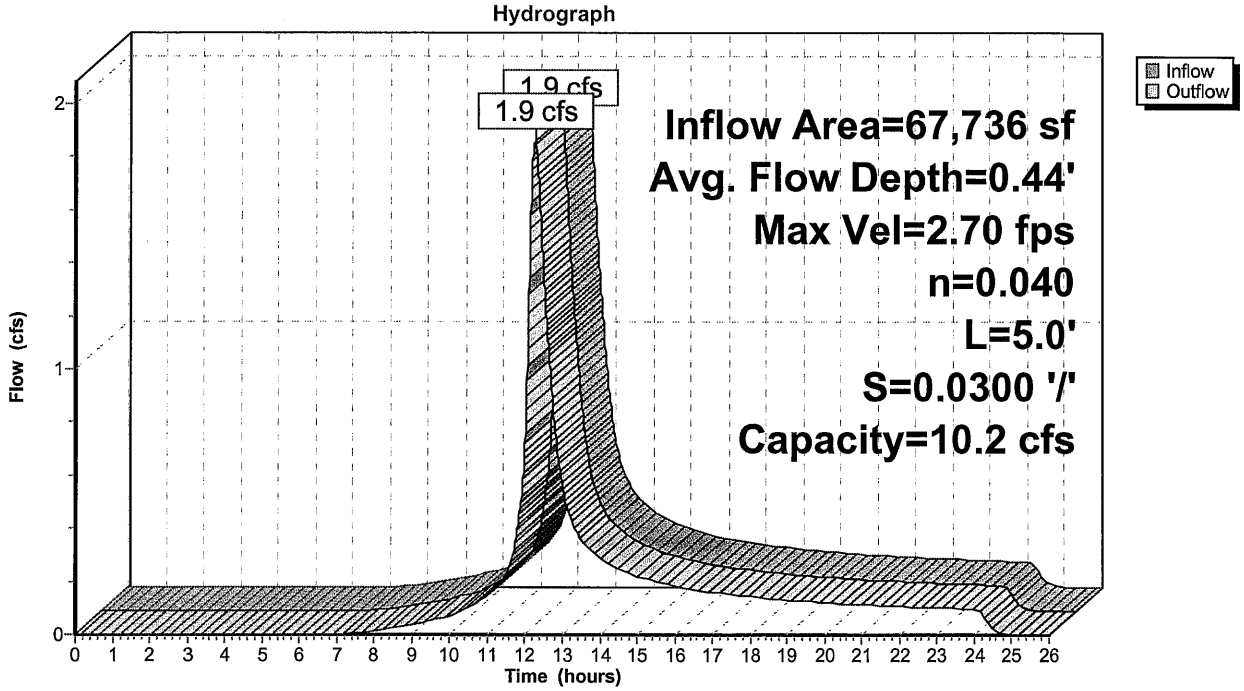
Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.70 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 0.1 min

Peak Storage= 3 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.44'
Bank-Full Depth= 1.00' Flow Area= 2.3 sf, Capacity= 10.2 cfs

3.50' x 1.00' deep Parabolic Channel, n= 0.040 Winding stream, pools & shoals
Length= 5.0' Slope= 0.0300 '/'
Inlet Invert= 21.90', Outlet Invert= 21.75'



Reach R3: R3



Summary for Reach R4: R4

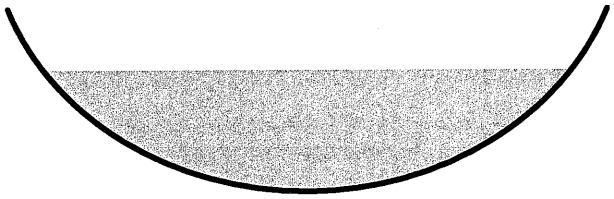
[62] Hint: Exceeded Reach R1 OUTLET depth by 0.27' @ 12.26 hrs
[63] Warning: Exceeded Reach R3 INLET depth by 0.07' @ 12.20 hrs

Inflow Area = 144,288 sf, 22.03% Impervious, Inflow Depth = 2.51" for 10-yr event
Inflow = 4.7 cfs @ 12.23 hrs, Volume= 30,219 cf
Outflow = 4.7 cfs @ 12.23 hrs, Volume= 30,219 cf, Atten= 0%, Lag= 0.2 min

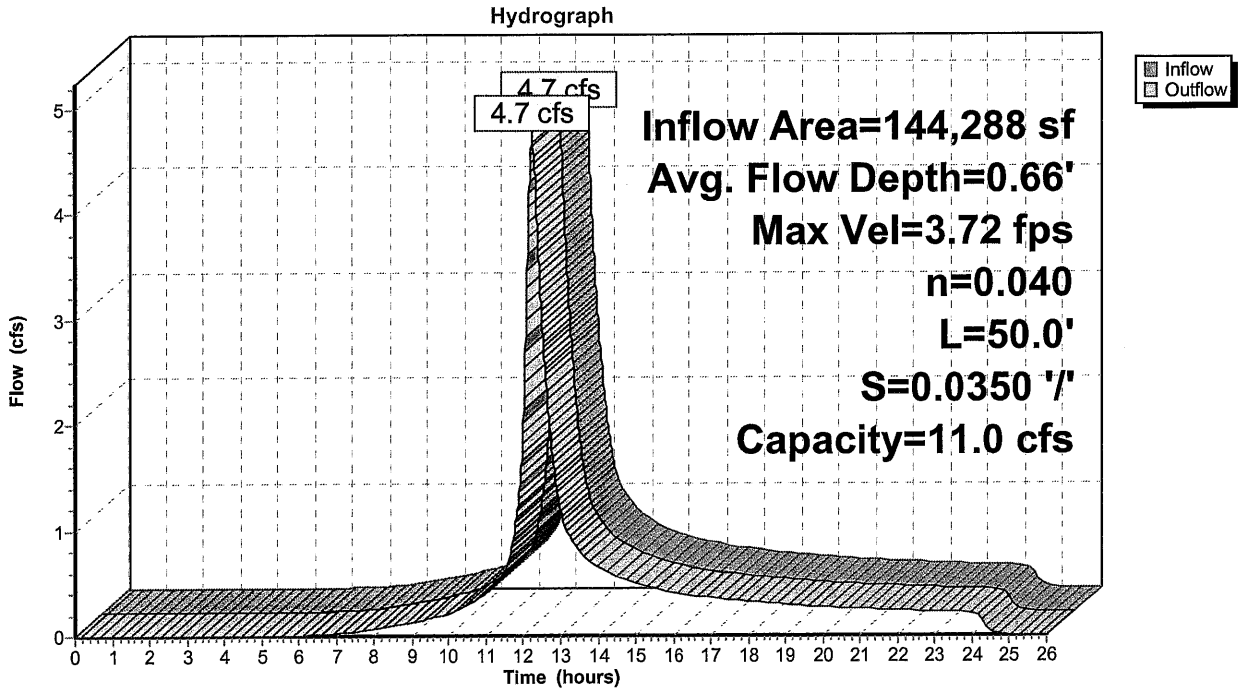
Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.72 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.57 fps, Avg. Travel Time= 0.5 min

Peak Storage= 63 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.66'
Bank-Full Depth= 1.00' Flow Area= 2.3 sf, Capacity= 11.0 cfs

3.50' x 1.00' deep Parabolic Channel, n= 0.040 Winding stream, pools & shoals
Length= 50.0' Slope= 0.0350 '/'
Inlet Invert= 21.75', Outlet Invert= 20.00'



Reach R4: R4



Summary for Pond Ex. Pipe A: Ex. Pipe A

[61] Hint: Exceeded Reach R4 outlet invert by 0.05' @ 12.27 hrs

Inflow Area =	159,194 sf,	19.97% Impervious,	Inflow Depth =	2.47"	for 10-yr event
Inflow =	5.0 cfs @	12.22 hrs, Volume=	32,736 cf		
Outflow =	4.8 cfs @	12.27 hrs, Volume=	32,736 cf,	Atten= 2%,	Lag= 2.7 min
Primary =	4.8 cfs @	12.27 hrs, Volume=	32,736 cf		
Secondary =	0.0 cfs @	0.00 hrs, Volume=	0 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 20.05' @ 12.27 hrs Surf.Area= 348 sf Storage= 263 cf
Flood Elev= 20.50' Surf.Area= 1,070 sf Storage= 564 cf

Plug-Flow detention time= 0.4 min calculated for 32,736 cf (100% of inflow)
Center-of-Mass det. time= 0.3 min (876.1 - 875.8)

Volume	Invert	Avail.Storage	Storage Description
#1	17.90'	564 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

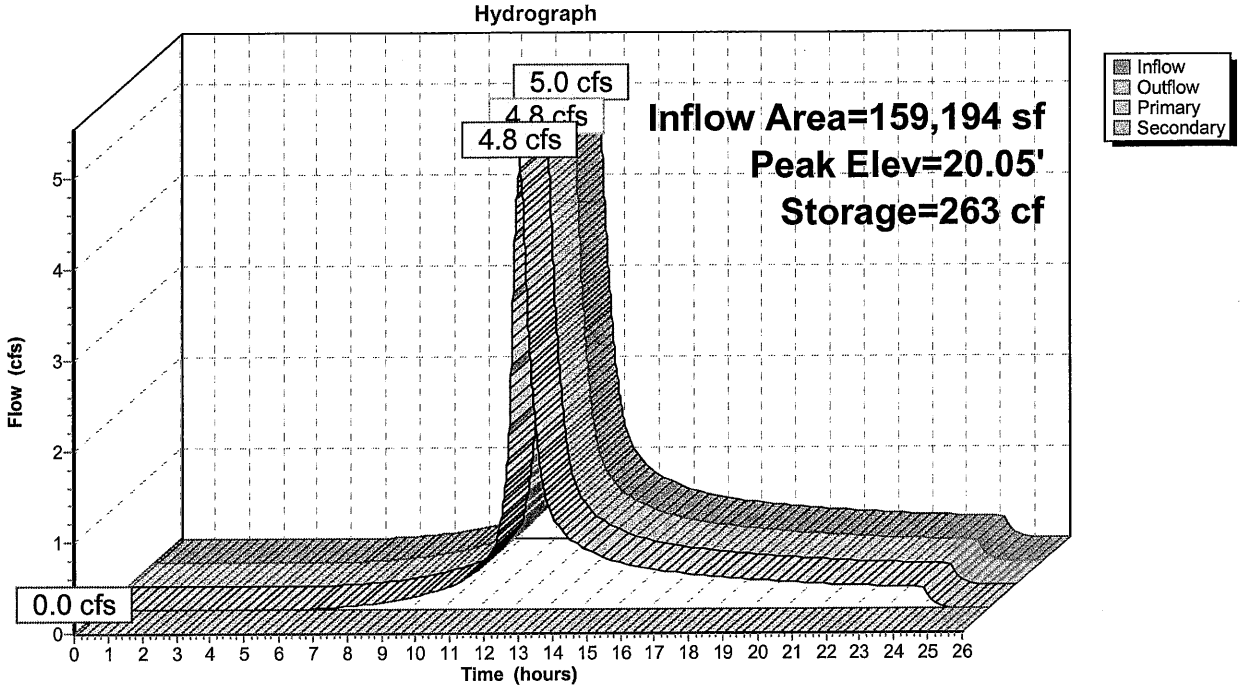
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
17.90	10	12.0	0	0	10
20.00	287	144.7	245	245	1,673
20.50	1,070	215.9	319	564	3,718

Device	Routing	Invert	Outlet Devices
#1	Primary	17.92'	**12.0" Round Culvert** L= 4.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 17.92' / 17.50' S= 0.1050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Secondary	20.10'	**10.0' long x 5.0' 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 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=4.8 cfs @ 12.27 hrs HW=20.05' (Free Discharge)
└**1=Culvert** (Inlet Controls 4.8 cfs @ 6.16 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=17.90' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

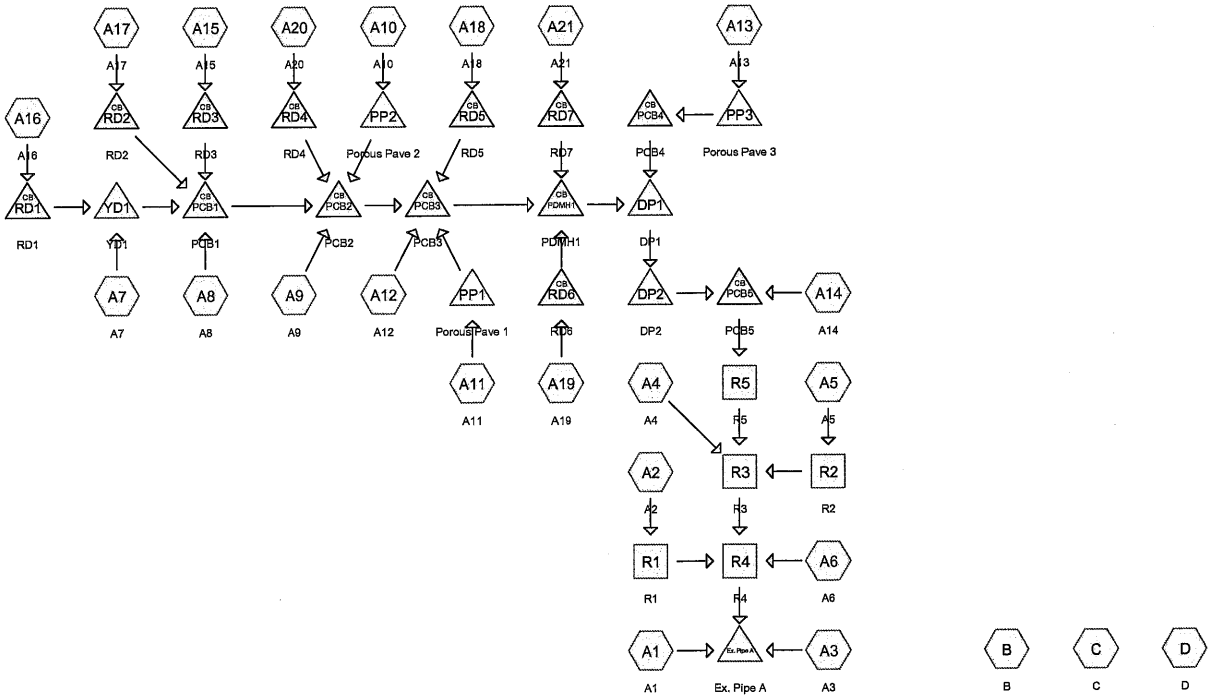
Pond Ex. Pipe A: Ex. Pipe A



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A-2

DEVELOPED WATERSHEDS



Subcat Reach Pond Link

Routing Diagram for 1795 - Post

Prepared by {enter your company name here}, Printed 6/25/2018

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.271	70	Woods, Good, HSG C (A1, A3, A7)
0.718	74	>75% Grass cover, Good, HSG C (A1, A10, A11, A13, A14, A4, A5, A6, A7, A8, A9, B, C, D)
0.066	77	Woods, Good, HSG D (A3)
1.123	79	1 acre lots, 20% imp, HSG C (A2)
0.028	80	>75% Grass cover, Good, HSG D (A3, A4)
0.238	83	1/4 acre lots, 38% imp, HSG C (A2)
0.370	90	1/8 acre lots, 65% imp, HSG C (A2, A4)
0.644	98	Paved parking, HSG C (A10, A11, A12, A13, A14, A7, A8, A9, B, D)
0.358	98	Roofs, HSG C (A15, A16, A17, A18, A19, A20, A21)
0.026	98	Unconnected pavement, HSG C (A1, A3, A4)
0.084	98	Unconnected roofs, HSG C (A6, A7, A9, D)
3.925	**84**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
3.832	HSG C	A1, A10, A11, A12, A13, A14, A15, A16, A17, A18, A19, A2, A20, A21, A3, A4, A5, A6, A7, A8, A9, B, C, D
0.093	HSG D	A3, A4
0.000	Other	
3.925		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.718	0.028	0.000	0.745	>75% Grass cover, Good	A1, A10, A11, A13, A14, A3, A4, A5, A6, A7, A8, A9, B, C, D
0.000	0.000	0.644	0.000	0.000	0.644	Paved parking	A10, A11, A12, A13, A14, A7, A8, A9, B, D
0.000	0.000	0.026	0.000	0.000	0.026	Unconnected pavement	A1, A3, A4
0.000	0.000	0.358	0.000	0.000	0.358	Roofs	A15, A16, A17, A18, A19, A20, A21
0.000	0.000	0.084	0.000	0.000	0.084	Unconnected roofs	A6, A7, A9, D
0.000	0.000	0.370	0.000	0.000	0.370	1/8 acre lots, 65% imp	A2, A4
0.000	0.000	0.238	0.000	0.000	0.238	1/4 acre lots, 38% imp	A2
0.000	0.000	1.123	0.000	0.000	1.123	1 acre lots, 20% imp	A2
0.000	0.000	0.271	0.066	0.000	0.336	Woods, Good	A1, A3, A7
0.000	**0.000**	**3.832**	**0.093**	**0.000**	**3.925**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	DP1	40.65	40.65	5.0	0.0000	0.012	18.0	0.0	0.0
2	DP2	38.40	38.35	5.0	0.0100	0.012	15.0	0.0	0.0
3	Ex. Pipe A	17.92	17.50	4.0	0.1050	0.012	12.0	0.0	0.0
4	PCB1	53.15	52.00	44.0	0.0261	0.012	15.0	0.0	0.0
5	PCB2	51.90	51.70	20.0	0.0100	0.012	15.0	0.0	0.0
6	PCB3	51.60	44.50	78.0	0.0910	0.012	15.0	0.0	0.0
7	PCB4	43.65	43.45	20.0	0.0100	0.012	12.0	0.0	0.0
8	PCB5	38.25	38.20	5.0	0.0100	0.012	15.0	0.0	0.0
9	PDMH1	42.50	42.50	5.0	0.0000	0.012	15.0	0.0	0.0
10	PP1	59.55	53.75	30.0	0.1933	0.012	6.0	0.0	0.0
11	PP2	53.05	52.70	5.0	0.0700	0.012	6.0	0.0	0.0
12	PP3	43.85	43.75	10.0	0.0100	0.012	6.0	0.0	0.0
13	RD1	64.30	61.20	83.0	0.0373	0.012	8.0	0.0	0.0
14	RD2	55.00	54.00	83.0	0.0120	0.012	8.0	0.0	0.0
15	RD3	69.50	54.00	235.0	0.0660	0.012	8.0	0.0	0.0
16	RD4	54.00	52.70	83.0	0.0157	0.012	8.0	0.0	0.0
17	RD5	55.00	52.70	74.0	0.0311	0.012	8.0	0.0	0.0
18	RD6	45.75	45.00	75.0	0.0100	0.012	8.0	0.0	0.0
19	RD7	44.35	43.40	95.0	0.0100	0.012	8.0	0.0	0.0
20	YD1	58.50	53.50	52.0	0.0962	0.012	12.0	0.0	0.0

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A – 2

NODE LISTING – 2-YR

Time span=0.00-26.00 hrs, dt=0.01 hrs, 2601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentA1: A1 Runoff Area=5,685 sf 0.95% Impervious Runoff Depth=0.85"
Flow Length=219' Tc=7.8 min CN=71 Runoff=0.1 cfs 0.009 af

SubcatchmentA10: A10 Runoff Area=4,014 sf 91.63% Impervious Runoff Depth=2.70"
Flow Length=29' Slope=0.0100 '/' Tc=2.2 min CN=96 Runoff=0.3 cfs 0.021 af

SubcatchmentA11: A11 Runoff Area=4,672 sf 84.16% Impervious Runoff Depth=2.50"
Flow Length=32' Slope=0.0625 '/' Tc=3.7 min CN=94 Runoff=0.3 cfs 0.022 af

SubcatchmentA12: A12 Runoff Area=757 sf 100.00% Impervious Runoff Depth=2.92"
Flow Length=48' Slope=0.1390 '/' Tc=0.1 min CN=98 Runoff=0.1 cfs 0.004 af

SubcatchmentA13: A13 Runoff Area=6,461 sf 82.11% Impervious Runoff Depth=2.50"
Flow Length=134' Slope=0.1000 '/' Tc=2.5 min CN=94 Runoff=0.5 cfs 0.031 af

SubcatchmentA14: A14 Runoff Area=5,961 sf 83.48% Impervious Runoff Depth=2.50"
Flow Length=45' Tc=1.8 min CN=94 Runoff=0.4 cfs 0.028 af

SubcatchmentA15: A15 Runoff Area=3,904 sf 100.00% Impervious Runoff Depth=2.92"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.3 cfs 0.022 af

SubcatchmentA16: A16 Runoff Area=1,920 sf 100.00% Impervious Runoff Depth=2.92"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.011 af

SubcatchmentA17: A17 Runoff Area=1,984 sf 100.00% Impervious Runoff Depth=2.92"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.011 af

SubcatchmentA18: A18 Runoff Area=1,920 sf 100.00% Impervious Runoff Depth=2.92"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.011 af

SubcatchmentA19: A19 Runoff Area=1,984 sf 100.00% Impervious Runoff Depth=2.92"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.011 af

SubcatchmentA2: A2 Runoff Area=69,947 sf 29.53% Impervious Runoff Depth=1.43"
Flow Length=440' Tc=19.5 min CN=81 Runoff=1.5 cfs 0.191 af

SubcatchmentA20: A20 Runoff Area=1,920 sf 100.00% Impervious Runoff Depth=2.92"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.011 af

SubcatchmentA21: A21 Runoff Area=1,984 sf 100.00% Impervious Runoff Depth=2.92"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.011 af

SubcatchmentA3: A3 Runoff Area=9,105 sf 5.83% Impervious Runoff Depth=1.00"
Flow Length=185' Tc=6.0 min CN=74 Runoff=0.2 cfs 0.018 af

SubcatchmentA4: A4 Runoff Area=13,913 sf 29.47% Impervious Runoff Depth=1.43"
Flow Length=491' Tc=12.7 min UI Adjusted CN=81 Runoff=0.4 cfs 0.038 af

Subcatchment A5: A5 Runoff Area=613 sf 0.00% Impervious Runoff Depth=1.00"
Flow Length=11' Slope=0.2270 '/' Tc=0.9 min CN=74 Runoff=0.0 cfs 0.001 af

Subcatchment A6: A6 Runoff Area=6,605 sf 15.05% Impervious Runoff Depth=1.12"
Flow Length=144' Tc=7.0 min UI Adjusted CN=76 Runoff=0.2 cfs 0.014 af

Subcatchment A7: A7 Runoff Area=7,166 sf 23.86% Impervious Runoff Depth=1.18"
Flow Length=131' Tc=23.7 min UI Adjusted CN=77 Runoff=0.1 cfs 0.016 af

Subcatchment A8: A8 Runoff Area=1,995 sf 37.24% Impervious Runoff Depth=1.57"
Flow Length=65' Slope=0.2000 '/' Tc=4.1 min CN=83 Runoff=0.1 cfs 0.006 af

Subcatchment A9: A9 Runoff Area=7,850 sf 84.62% Impervious Runoff Depth=2.50"
Flow Length=261' Tc=3.1 min CN=94 Runoff=0.6 cfs 0.037 af

Subcatchment B: B Runoff Area=4,770 sf 14.19% Impervious Runoff Depth=1.18"
Flow Length=181' Tc=12.7 min CN=77 Runoff=0.1 cfs 0.011 af

Subcatchment C: C Runoff Area=1,110 sf 0.00% Impervious Runoff Depth=1.00"
Flow Length=29' Slope=0.0100 '/' Tc=7.0 min CN=74 Runoff=0.0 cfs 0.002 af

Subcatchment D: D Runoff Area=4,743 sf 48.20% Impervious Runoff Depth=1.79"
Flow Length=49' Slope=0.0100 '/' Tc=10.7 min CN=86 Runoff=0.2 cfs 0.016 af

Reach R1: R1 Avg. Flow Depth=0.30' Max Vel=4.02 fps Inflow=1.5 cfs 0.191 af
n=0.040 L=90.0' S=0.1083 '/' Capacity=19.4 cfs Outflow=1.5 cfs 0.191 af

Reach R2: R2 Avg. Flow Depth=0.04' Max Vel=0.92 fps Inflow=0.0 cfs 0.001 af
n=0.040 L=141.0' S=0.0787 '/' Capacity=16.6 cfs Outflow=0.0 cfs 0.001 af

Reach R3: R3 Avg. Flow Depth=0.32' Max Vel=2.20 fps Inflow=0.9 cfs 0.284 af
n=0.040 L=5.0' S=0.0300 '/' Capacity=10.2 cfs Outflow=0.9 cfs 0.284 af

Reach R4: R4 Avg. Flow Depth=0.49' Max Vel=3.09 fps Inflow=2.5 cfs 0.489 af
n=0.040 L=50.0' S=0.0350 '/' Capacity=11.0 cfs Outflow=2.5 cfs 0.489 af

Reach R5: R5 Avg. Flow Depth=0.22' Max Vel=3.21 fps Inflow=0.8 cfs 0.244 af
n=0.040 L=164.0' S=0.0994 '/' Capacity=18.6 cfs Outflow=0.8 cfs 0.244 af

Pond DP1: DP1 Peak Elev=42.77' Storage=1,365 cf Inflow=2.4 cfs 0.216 af
Outflow=1.0 cfs 0.216 af

Pond DP2: DP2 Peak Elev=39.84' Storage=1,155 cf Inflow=1.0 cfs 0.216 af
Outflow=0.8 cfs 0.216 af

Pond Ex. Pipe A: Ex. Pipe A Peak Elev=18.89' Storage=44 cf Inflow=2.6 cfs 0.516 af
Primary=2.6 cfs 0.516 af Secondary=0.0 cfs 0.000 af Outflow=2.6 cfs 0.516 af

Pond PCB1: PCB1 Peak Elev=53.55' Inflow=0.7 cfs 0.066 af
15.0" Round Culvert n=0.012 L=44.0' S=0.0261 '/' Outflow=0.7 cfs 0.066 af

Pond PCB2: PCB2 Peak Elev=52.59' Inflow=1.6 cfs 0.132 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0100 '/' Outflow=1.6 cfs 0.132 af

Pond PCB3: PCB3 Peak Elev=52.28' Inflow=1.9 cfs 0.166 af
15.0" Round Culvert n=0.012 L=78.0' S=0.0910 '/' Outflow=1.9 cfs 0.166 af

Pond PCB4: PCB4 Peak Elev=43.92' Inflow=0.3 cfs 0.028 af
12.0" Round Culvert n=0.012 L=20.0' S=0.0100 '/' Outflow=0.3 cfs 0.028 af

Pond PCB5: PCB5 Peak Elev=38.75' Inflow=0.8 cfs 0.244 af
15.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=0.8 cfs 0.244 af

Pond PDMH1: PDMH1 Peak Elev=43.44' Inflow=2.2 cfs 0.188 af
15.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=2.2 cfs 0.188 af

Pond PP1: Porous Pave 1 Peak Elev=59.86' Storage=258 cf Inflow=0.3 cfs 0.022 af
6.0" Round Culvert n=0.012 L=30.0' S=0.1933 '/' Outflow=0.2 cfs 0.019 af

Pond PP2: Porous Pave 2 Peak Elev=53.34' Storage=260 cf Inflow=0.3 cfs 0.021 af
6.0" Round Culvert n=0.012 L=5.0' S=0.0700 '/' Outflow=0.2 cfs 0.018 af

Pond PP3: Porous Pave 3 Peak Elev=44.24' Storage=317 cf Inflow=0.5 cfs 0.031 af
6.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.3 cfs 0.028 af

Pond RD1: RD1 Peak Elev=64.54' Inflow=0.2 cfs 0.011 af
8.0" Round Culvert n=0.012 L=83.0' S=0.0373 '/' Outflow=0.2 cfs 0.011 af

Pond RD2: RD2 Peak Elev=55.25' Inflow=0.2 cfs 0.011 af
8.0" Round Culvert n=0.012 L=83.0' S=0.0120 '/' Outflow=0.2 cfs 0.011 af

Pond RD3: RD3 Peak Elev=69.86' Inflow=0.3 cfs 0.022 af
8.0" Round Culvert n=0.012 L=235.0' S=0.0660 '/' Outflow=0.3 cfs 0.022 af

Pond RD4: RD4 Peak Elev=54.24' Inflow=0.2 cfs 0.011 af
8.0" Round Culvert n=0.012 L=83.0' S=0.0157 '/' Outflow=0.2 cfs 0.011 af

Pond RD5: RD5 Peak Elev=55.24' Inflow=0.2 cfs 0.011 af
8.0" Round Culvert n=0.012 L=74.0' S=0.0311 '/' Outflow=0.2 cfs 0.011 af

Pond RD6: RD6 Peak Elev=46.00' Inflow=0.2 cfs 0.011 af
8.0" Round Culvert n=0.012 L=75.0' S=0.0100 '/' Outflow=0.2 cfs 0.011 af

Pond RD7: RD7 Peak Elev=44.60' Inflow=0.2 cfs 0.011 af
8.0" Round Culvert n=0.012 L=95.0' S=0.0100 '/' Outflow=0.2 cfs 0.011 af

Pond YD1: YD1 Peak Elev=63.90' Storage=0 cf Inflow=0.2 cfs 0.027 af
12.0" Round Culvert n=0.012 L=52.0' S=0.0962 '/' Outflow=0.2 cfs 0.027 af

Total Runoff Area = 3.925 ac Runoff Volume = 0.554 af Average Runoff Depth = 1.69"
57.51% Pervious = 2.257 ac 42.49% Impervious = 1.668 ac

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A – 2

NODE LISTING – 10-YR

Time span=0.00-26.00 hrs, dt=0.01 hrs, 2601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentA1: A1 Runoff Area=5,685 sf 0.95% Impervious Runoff Depth=1.93"
Flow Length=219' Tc=7.8 min CN=71 Runoff=0.2 cfs 0.021 af

SubcatchmentA10: A10 Runoff Area=4,014 sf 91.63% Impervious Runoff Depth=4.28"
Flow Length=29' Slope=0.0100 '/' Tc=2.2 min CN=96 Runoff=0.4 cfs 0.033 af

SubcatchmentA11: A11 Runoff Area=4,672 sf 84.16% Impervious Runoff Depth=4.06"
Flow Length=32' Slope=0.0625 '/' Tc=3.7 min CN=94 Runoff=0.4 cfs 0.036 af

SubcatchmentA12: A12 Runoff Area=757 sf 100.00% Impervious Runoff Depth=4.51"
Flow Length=48' Slope=0.1390 '/' Tc=0.1 min CN=98 Runoff=0.1 cfs 0.007 af

SubcatchmentA13: A13 Runoff Area=6,461 sf 82.11% Impervious Runoff Depth=4.06"
Flow Length=134' Slope=0.1000 '/' Tc=2.5 min CN=94 Runoff=0.6 cfs 0.050 af

SubcatchmentA14: A14 Runoff Area=5,961 sf 83.48% Impervious Runoff Depth=4.06"
Flow Length=45' Tc=1.8 min CN=94 Runoff=0.6 cfs 0.046 af

SubcatchmentA15: A15 Runoff Area=3,904 sf 100.00% Impervious Runoff Depth=4.51"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.4 cfs 0.034 af

SubcatchmentA16: A16 Runoff Area=1,920 sf 100.00% Impervious Runoff Depth=4.51"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.017 af

SubcatchmentA17: A17 Runoff Area=1,984 sf 100.00% Impervious Runoff Depth=4.51"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.017 af

SubcatchmentA18: A18 Runoff Area=1,920 sf 100.00% Impervious Runoff Depth=4.51"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.017 af

SubcatchmentA19: A19 Runoff Area=1,984 sf 100.00% Impervious Runoff Depth=4.51"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.017 af

SubcatchmentA2: A2 Runoff Area=69,947 sf 29.53% Impervious Runoff Depth=2.77"
Flow Length=440' Tc=19.5 min CN=81 Runoff=2.7 cfs 0.370 af

SubcatchmentA20: A20 Runoff Area=1,920 sf 100.00% Impervious Runoff Depth=4.51"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.017 af

SubcatchmentA21: A21 Runoff Area=1,984 sf 100.00% Impervious Runoff Depth=4.51"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.017 af

SubcatchmentA3: A3 Runoff Area=9,105 sf 5.83% Impervious Runoff Depth=2.17"
Flow Length=185' Tc=6.0 min CN=74 Runoff=0.4 cfs 0.038 af

SubcatchmentA4: A4 Runoff Area=13,913 sf 29.47% Impervious Runoff Depth=2.77"
Flow Length=491' Tc=12.7 min UI Adjusted CN=81 Runoff=0.7 cfs 0.074 af

SubcatchmentA5: A5 Runoff Area=613 sf 0.00% Impervious Runoff Depth=2.17"
Flow Length=11' Slope=0.2270 '/' Tc=0.9 min CN=74 Runoff=0.0 cfs 0.003 af

SubcatchmentA6: A6 Runoff Area=6,605 sf 15.05% Impervious Runoff Depth=2.33"
Flow Length=144' Tc=7.0 min UI Adjusted CN=76 Runoff=0.3 cfs 0.029 af

SubcatchmentA7: A7 Runoff Area=7,166 sf 23.86% Impervious Runoff Depth=2.42"
Flow Length=131' Tc=23.7 min UI Adjusted CN=77 Runoff=0.2 cfs 0.033 af

SubcatchmentA8: A8 Runoff Area=1,995 sf 37.24% Impervious Runoff Depth=2.95"
Flow Length=65' Slope=0.2000 '/' Tc=4.1 min CN=83 Runoff=0.1 cfs 0.011 af

SubcatchmentA9: A9 Runoff Area=7,850 sf 84.62% Impervious Runoff Depth=4.06"
Flow Length=261' Tc=3.1 min CN=94 Runoff=0.8 cfs 0.061 af

SubcatchmentB: B Runoff Area=4,770 sf 14.19% Impervious Runoff Depth=2.42"
Flow Length=181' Tc=12.7 min CN=77 Runoff=0.2 cfs 0.022 af

SubcatchmentC: C Runoff Area=1,110 sf 0.00% Impervious Runoff Depth=2.17"
Flow Length=29' Slope=0.0100 '/' Tc=7.0 min CN=74 Runoff=0.1 cfs 0.005 af

SubcatchmentD: D Runoff Area=4,743 sf 48.20% Impervious Runoff Depth=3.23"
Flow Length=49' Slope=0.0100 '/' Tc=10.7 min CN=86 Runoff=0.3 cfs 0.029 af

Reach R1: R1 Avg. Flow Depth=0.39' Max Vel=4.74 fps Inflow=2.7 cfs 0.370 af
n=0.040 L=90.0' S=0.1083 '/' Capacity=19.4 cfs Outflow=2.7 cfs 0.370 af

Reach R2: R2 Avg. Flow Depth=0.05' Max Vel=1.14 fps Inflow=0.0 cfs 0.003 af
n=0.040 L=141.0' S=0.0787 '/' Capacity=16.6 cfs Outflow=0.0 cfs 0.003 af

Reach R3: R3 Avg. Flow Depth=0.42' Max Vel=2.62 fps Inflow=1.7 cfs 0.479 af
n=0.040 L=5.0' S=0.0300 '/' Capacity=10.2 cfs Outflow=1.7 cfs 0.479 af

Reach R4: R4 Avg. Flow Depth=0.65' Max Vel=3.68 fps Inflow=4.5 cfs 0.879 af
n=0.040 L=50.0' S=0.0350 '/' Capacity=11.0 cfs Outflow=4.5 cfs 0.879 af

Reach R5: R5 Avg. Flow Depth=0.29' Max Vel=3.75 fps Inflow=1.4 cfs 0.403 af
n=0.040 L=164.0' S=0.0994 '/' Capacity=18.6 cfs Outflow=1.4 cfs 0.403 af

Pond DP1: DP1 Peak Elev=43.41' Storage=1,904 cf Inflow=3.4 cfs 0.357 af
Outflow=1.9 cfs 0.357 af

Pond DP2: DP2 Peak Elev=40.32' Storage=1,730 cf Inflow=1.9 cfs 0.357 af
Outflow=1.3 cfs 0.357 af

Pond Ex. Pipe A: Ex. Pipe A Peak Elev=19.99' Storage=242 cf Inflow=4.8 cfs 0.938 af
Primary=4.7 cfs 0.938 af Secondary=0.0 cfs 0.000 af Outflow=4.7 cfs 0.938 af

Pond PCB1: PCB1 Peak Elev=53.63' Inflow=1.0 cfs 0.112 af
15.0" Round Culvert n=0.012 L=44.0' S=0.0261 '/' Outflow=1.0 cfs 0.112 af

Pond PCB2: PCB2 Peak Elev=52.75' Inflow=2.2 cfs 0.219 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0100 '/' Outflow=2.2 cfs 0.219 af

Pond PCB3: PCB3 Peak Elev=52.42' Inflow=2.6 cfs 0.276 af
15.0" Round Culvert n=0.012 L=78.0' S=0.0910 '/' Outflow=2.6 cfs 0.276 af

Pond PCB4: PCB4 Peak Elev=43.97' Inflow=0.4 cfs 0.047 af
12.0" Round Culvert n=0.012 L=20.0' S=0.0100 '/' Outflow=0.4 cfs 0.047 af

Pond PCB5: PCB5 Peak Elev=38.92' Inflow=1.4 cfs 0.403 af
15.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=1.4 cfs 0.403 af

Pond PDMH1: PDMH1 Peak Elev=43.64' Inflow=3.0 cfs 0.310 af
15.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=3.0 cfs 0.310 af

Pond PP1: Porous Pave 1 Peak Elev=59.95' Storage=297 cf Inflow=0.4 cfs 0.036 af
6.0" Round Culvert n=0.012 L=30.0' S=0.1933 '/' Outflow=0.3 cfs 0.033 af

Pond PP2: Porous Pave 2 Peak Elev=53.42' Storage=295 cf Inflow=0.4 cfs 0.033 af
6.0" Round Culvert n=0.012 L=5.0' S=0.0700 '/' Outflow=0.3 cfs 0.030 af

Pond PP3: Porous Pave 3 Peak Elev=44.36' Storage=375 cf Inflow=0.6 cfs 0.050 af
6.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.4 cfs 0.047 af

Pond RD1: RD1 Peak Elev=64.58' Inflow=0.2 cfs 0.017 af
8.0" Round Culvert n=0.012 L=83.0' S=0.0373 '/' Outflow=0.2 cfs 0.017 af

Pond RD2: RD2 Peak Elev=55.29' Inflow=0.2 cfs 0.017 af
8.0" Round Culvert n=0.012 L=83.0' S=0.0120 '/' Outflow=0.2 cfs 0.017 af

Pond RD3: RD3 Peak Elev=69.92' Inflow=0.4 cfs 0.034 af
8.0" Round Culvert n=0.012 L=235.0' S=0.0660 '/' Outflow=0.4 cfs 0.034 af

Pond RD4: RD4 Peak Elev=54.28' Inflow=0.2 cfs 0.017 af
8.0" Round Culvert n=0.012 L=83.0' S=0.0157 '/' Outflow=0.2 cfs 0.017 af

Pond RD5: RD5 Peak Elev=55.28' Inflow=0.2 cfs 0.017 af
8.0" Round Culvert n=0.012 L=74.0' S=0.0311 '/' Outflow=0.2 cfs 0.017 af

Pond RD6: RD6 Peak Elev=46.04' Inflow=0.2 cfs 0.017 af
8.0" Round Culvert n=0.012 L=75.0' S=0.0100 '/' Outflow=0.2 cfs 0.017 af

Pond RD7: RD7 Peak Elev=44.64' Inflow=0.2 cfs 0.017 af
8.0" Round Culvert n=0.012 L=95.0' S=0.0100 '/' Outflow=0.2 cfs 0.017 af

Pond YD1: YD1 Peak Elev=63.90' Storage=0 cf Inflow=0.3 cfs 0.050 af
12.0" Round Culvert n=0.012 L=52.0' S=0.0962 '/' Outflow=0.3 cfs 0.050 af

Total Runoff Area = 3.925 ac Runoff Volume = 1.003 af Average Runoff Depth = 3.07"
57.51% Pervious = 2.257 ac 42.49% Impervious = 1.668 ac

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A – 2

NODE LISTING – 25-YR

Time span=0.00-26.00 hrs, dt=0.01 hrs, 2601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentA1: A1 Runoff Area=5,685 sf 0.95% Impervious Runoff Depth=2.91"
Flow Length=219' Tc=7.8 min CN=71 Runoff=0.3 cfs 0.032 af

SubcatchmentA10: A10 Runoff Area=4,014 sf 91.63% Impervious Runoff Depth=5.54"
Flow Length=29' Slope=0.0100 '/' Tc=2.2 min CN=96 Runoff=0.5 cfs 0.043 af

SubcatchmentA11: A11 Runoff Area=4,672 sf 84.16% Impervious Runoff Depth=5.31"
Flow Length=32' Slope=0.0625 '/' Tc=3.7 min CN=94 Runoff=0.5 cfs 0.047 af

SubcatchmentA12: A12 Runoff Area=757 sf 100.00% Impervious Runoff Depth=5.77"
Flow Length=48' Slope=0.1390 '/' Tc=0.1 min CN=98 Runoff=0.1 cfs 0.008 af

SubcatchmentA13: A13 Runoff Area=6,461 sf 82.11% Impervious Runoff Depth=5.31"
Flow Length=134' Slope=0.1000 '/' Tc=2.5 min CN=94 Runoff=0.8 cfs 0.066 af

SubcatchmentA14: A14 Runoff Area=5,961 sf 83.48% Impervious Runoff Depth=5.31"
Flow Length=45' Tc=1.8 min CN=94 Runoff=0.7 cfs 0.061 af

SubcatchmentA15: A15 Runoff Area=3,904 sf 100.00% Impervious Runoff Depth=5.77"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.5 cfs 0.043 af

SubcatchmentA16: A16 Runoff Area=1,920 sf 100.00% Impervious Runoff Depth=5.77"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.021 af

SubcatchmentA17: A17 Runoff Area=1,984 sf 100.00% Impervious Runoff Depth=5.77"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.022 af

SubcatchmentA18: A18 Runoff Area=1,920 sf 100.00% Impervious Runoff Depth=5.77"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.021 af

SubcatchmentA19: A19 Runoff Area=1,984 sf 100.00% Impervious Runoff Depth=5.77"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.022 af

SubcatchmentA2: A2 Runoff Area=69,947 sf 29.53% Impervious Runoff Depth=3.89"
Flow Length=440' Tc=19.5 min CN=81 Runoff=3.6 cfs 0.521 af

SubcatchmentA20: A20 Runoff Area=1,920 sf 100.00% Impervious Runoff Depth=5.77"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.021 af

SubcatchmentA21: A21 Runoff Area=1,984 sf 100.00% Impervious Runoff Depth=5.77"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.2 cfs 0.022 af

SubcatchmentA3: A3 Runoff Area=9,105 sf 5.83% Impervious Runoff Depth=3.19"
Flow Length=185' Tc=6.0 min CN=74 Runoff=0.6 cfs 0.056 af

SubcatchmentA4: A4 Runoff Area=13,913 sf 29.47% Impervious Runoff Depth=3.89"
Flow Length=491' Tc=12.7 min UI Adjusted CN=81 Runoff=0.9 cfs 0.104 af

Subcatchment A5: A5 Runoff Area=613 sf 0.00% Impervious Runoff Depth=3.19"
Flow Length=11' Slope=0.2270 '/' Tc=0.9 min CN=74 Runoff=0.0 cfs 0.004 af

Subcatchment A6: A6 Runoff Area=6,605 sf 15.05% Impervious Runoff Depth=3.39"
Flow Length=144' Tc=7.0 min UI Adjusted CN=76 Runoff=0.4 cfs 0.043 af

Subcatchment A7: A7 Runoff Area=7,166 sf 23.86% Impervious Runoff Depth=3.49"
Flow Length=131' Tc=23.7 min UI Adjusted CN=77 Runoff=0.3 cfs 0.048 af

Subcatchment A8: A8 Runoff Area=1,995 sf 37.24% Impervious Runoff Depth=4.10"
Flow Length=65' Slope=0.2000 '/' Tc=4.1 min CN=83 Runoff=0.2 cfs 0.016 af

Subcatchment A9: A9 Runoff Area=7,850 sf 84.62% Impervious Runoff Depth=5.31"
Flow Length=261' Tc=3.1 min CN=94 Runoff=0.9 cfs 0.080 af

Subcatchment B: B Runoff Area=4,770 sf 14.19% Impervious Runoff Depth=3.49"
Flow Length=181' Tc=12.7 min CN=77 Runoff=0.3 cfs 0.032 af

Subcatchment C: C Runoff Area=1,110 sf 0.00% Impervious Runoff Depth=3.19"
Flow Length=29' Slope=0.0100 '/' Tc=7.0 min CN=74 Runoff=0.1 cfs 0.007 af

Subcatchment D: D Runoff Area=4,743 sf 48.20% Impervious Runoff Depth=4.42"
Flow Length=49' Slope=0.0100 '/' Tc=10.7 min CN=86 Runoff=0.4 cfs 0.040 af

Reach R1: R1 Avg. Flow Depth=0.45' Max Vel=5.14 fps Inflow=3.6 cfs 0.521 af
n=0.040 L=90.0' S=0.1083 '/' Capacity=19.4 cfs Outflow=3.6 cfs 0.521 af

Reach R2: R2 Avg. Flow Depth=0.06' Max Vel=1.26 fps Inflow=0.0 cfs 0.004 af
n=0.040 L=141.0' S=0.0787 '/' Capacity=16.6 cfs Outflow=0.0 cfs 0.004 af

Reach R3: R3 Avg. Flow Depth=0.52' Max Vel=2.96 fps Inflow=2.6 cfs 0.638 af
n=0.040 L=5.0' S=0.0300 '/' Capacity=10.2 cfs Outflow=2.6 cfs 0.638 af

Reach R4: R4 Avg. Flow Depth=0.76' Max Vel=4.04 fps Inflow=6.3 cfs 1.202 af
n=0.040 L=50.0' S=0.0350 '/' Capacity=11.0 cfs Outflow=6.3 cfs 1.202 af

Reach R5: R5 Avg. Flow Depth=0.33' Max Vel=4.10 fps Inflow=1.8 cfs 0.531 af
n=0.040 L=164.0' S=0.0994 '/' Capacity=18.6 cfs Outflow=1.8 cfs 0.531 af

Pond DP1: DP1 Peak Elev=43.53' Storage=2,004 cf Inflow=4.0 cfs 0.471 af
Outflow=3.0 cfs 0.471 af

Pond DP2: DP2 Peak Elev=40.68' Storage=2,183 cf Inflow=3.0 cfs 0.471 af
Outflow=1.7 cfs 0.470 af

Pond Ex. Pipe A: Ex. Pipe A Peak Elev=20.27' Storage=366 cf Inflow=6.7 cfs 1.289 af
Primary=5.1 cfs 1.259 af Secondary=1.6 cfs 0.030 af Outflow=6.7 cfs 1.289 af

Pond PCB1: PCB1 Peak Elev=53.68' Inflow=1.2 cfs 0.150 af
15.0" Round Culvert n=0.012 L=44.0' S=0.0261 '/' Outflow=1.2 cfs 0.150 af

Pond PCB2: PCB2 Peak Elev=52.87' Inflow=2.6 cfs 0.290 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0100 '/' Outflow=2.6 cfs 0.290 af

Pond PCB3: PCB3 Peak Elev=52.52' Inflow=3.2 cfs 0.364 af
15.0" Round Culvert n=0.012 L=78.0' S=0.0910 '/' Outflow=3.2 cfs 0.364 af

Pond PCB4: PCB4 Peak Elev=44.00' Inflow=0.4 cfs 0.063 af
12.0" Round Culvert n=0.012 L=20.0' S=0.0100 '/' Outflow=0.4 cfs 0.063 af

Pond PCB5: PCB5 Peak Elev=39.04' Inflow=1.8 cfs 0.531 af
15.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=1.8 cfs 0.531 af

Pond PDMH1: PDMH1 Peak Elev=43.78' Inflow=3.7 cfs 0.408 af
15.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=3.7 cfs 0.408 af

Pond PP1: Porous Pave 1 Peak Elev=60.01' Storage=325 cf Inflow=0.5 cfs 0.047 af
6.0" Round Culvert n=0.012 L=30.0' S=0.1933 '/' Outflow=0.3 cfs 0.045 af

Pond PP2: Porous Pave 2 Peak Elev=53.47' Storage=320 cf Inflow=0.5 cfs 0.043 af
6.0" Round Culvert n=0.012 L=5.0' S=0.0700 '/' Outflow=0.3 cfs 0.040 af

Pond PP3: Porous Pave 3 Peak Elev=44.45' Storage=419 cf Inflow=0.8 cfs 0.066 af
6.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.4 cfs 0.063 af

Pond RD1: RD1 Peak Elev=64.61' Inflow=0.2 cfs 0.021 af
8.0" Round Culvert n=0.012 L=83.0' S=0.0373 '/' Outflow=0.2 cfs 0.021 af

Pond RD2: RD2 Peak Elev=55.31' Inflow=0.2 cfs 0.022 af
8.0" Round Culvert n=0.012 L=83.0' S=0.0120 '/' Outflow=0.2 cfs 0.022 af

Pond RD3: RD3 Peak Elev=69.96' Inflow=0.5 cfs 0.043 af
8.0" Round Culvert n=0.012 L=235.0' S=0.0660 '/' Outflow=0.5 cfs 0.043 af

Pond RD4: RD4 Peak Elev=54.31' Inflow=0.2 cfs 0.021 af
8.0" Round Culvert n=0.012 L=83.0' S=0.0157 '/' Outflow=0.2 cfs 0.021 af

Pond RD5: RD5 Peak Elev=55.31' Inflow=0.2 cfs 0.021 af
8.0" Round Culvert n=0.012 L=74.0' S=0.0311 '/' Outflow=0.2 cfs 0.021 af

Pond RD6: RD6 Peak Elev=46.06' Inflow=0.2 cfs 0.022 af
8.0" Round Culvert n=0.012 L=75.0' S=0.0100 '/' Outflow=0.2 cfs 0.022 af

Pond RD7: RD7 Peak Elev=44.66' Inflow=0.2 cfs 0.022 af
8.0" Round Culvert n=0.012 L=95.0' S=0.0100 '/' Outflow=0.2 cfs 0.022 af

Pond YD1: YD1 Peak Elev=63.90' Storage=0 cf Inflow=0.4 cfs 0.069 af
12.0" Round Culvert n=0.012 L=52.0' S=0.0962 '/' Outflow=0.4 cfs 0.069 af

Total Runoff Area = 3.925 ac Runoff Volume = 1.377 af Average Runoff Depth = 4.21"
57.51% Pervious = 2.257 ac 42.49% Impervious = 1.668 ac

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A – 2

NODE LISTING – 50-YR

Time span=0.00-26.00 hrs, dt=0.01 hrs, 2601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentA1: A1 Runoff Area=5,685 sf 0.95% Impervious Runoff Depth=3.88"
Flow Length=219' Tc=7.8 min CN=71 Runoff=0.4 cfs 0.042 af

SubcatchmentA10: A10 Runoff Area=4,014 sf 91.63% Impervious Runoff Depth=6.70"
Flow Length=29' Slope=0.0100 '/' Tc=2.2 min CN=96 Runoff=0.6 cfs 0.051 af

SubcatchmentA11: A11 Runoff Area=4,672 sf 84.16% Impervious Runoff Depth=6.47"
Flow Length=32' Slope=0.0625 '/' Tc=3.7 min CN=94 Runoff=0.6 cfs 0.058 af

SubcatchmentA12: A12 Runoff Area=757 sf 100.00% Impervious Runoff Depth=6.94"
Flow Length=48' Slope=0.1390 '/' Tc=0.1 min CN=98 Runoff=0.1 cfs 0.010 af

SubcatchmentA13: A13 Runoff Area=6,461 sf 82.11% Impervious Runoff Depth=6.47"
Flow Length=134' Slope=0.1000 '/' Tc=2.5 min CN=94 Runoff=0.9 cfs 0.080 af

SubcatchmentA14: A14 Runoff Area=5,961 sf 83.48% Impervious Runoff Depth=6.47"
Flow Length=45' Tc=1.8 min CN=94 Runoff=0.8 cfs 0.074 af

SubcatchmentA15: A15 Runoff Area=3,904 sf 100.00% Impervious Runoff Depth=6.94"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.5 cfs 0.052 af

SubcatchmentA16: A16 Runoff Area=1,920 sf 100.00% Impervious Runoff Depth=6.94"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.3 cfs 0.025 af

SubcatchmentA17: A17 Runoff Area=1,984 sf 100.00% Impervious Runoff Depth=6.94"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.3 cfs 0.026 af

SubcatchmentA18: A18 Runoff Area=1,920 sf 100.00% Impervious Runoff Depth=6.94"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.3 cfs 0.025 af

SubcatchmentA19: A19 Runoff Area=1,984 sf 100.00% Impervious Runoff Depth=6.94"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.3 cfs 0.026 af

SubcatchmentA2: A2 Runoff Area=69,947 sf 29.53% Impervious Runoff Depth=4.97"
Flow Length=440' Tc=19.5 min CN=81 Runoff=4.4 cfs 0.665 af

SubcatchmentA20: A20 Runoff Area=1,920 sf 100.00% Impervious Runoff Depth=6.94"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.3 cfs 0.025 af

SubcatchmentA21: A21 Runoff Area=1,984 sf 100.00% Impervious Runoff Depth=6.94"
Flow Length=31' Slope=0.3000 '/' Tc=0.2 min CN=98 Runoff=0.3 cfs 0.026 af

SubcatchmentA3: A3 Runoff Area=9,105 sf 5.83% Impervious Runoff Depth=4.20"
Flow Length=185' Tc=6.0 min CN=74 Runoff=0.8 cfs 0.073 af

SubcatchmentA4: A4 Runoff Area=13,913 sf 29.47% Impervious Runoff Depth=4.97"
Flow Length=491' Tc=12.7 min UI Adjusted CN=81 Runoff=1.0 cfs 0.132 af

Subcatchment A5: A5 Runoff Area=613 sf 0.00% Impervious Runoff Depth=4.20"
Flow Length=11' Slope=0.2270 '/' Tc=0.9 min CN=74 Runoff=0.1 cfs 0.005 af

Subcatchment A6: A6 Runoff Area=6,605 sf 15.05% Impervious Runoff Depth=4.42"
Flow Length=144' Tc=7.0 min UI Adjusted CN=76 Runoff=0.6 cfs 0.056 af

Subcatchment A7: A7 Runoff Area=7,166 sf 23.86% Impervious Runoff Depth=4.53"
Flow Length=131' Tc=23.7 min UI Adjusted CN=77 Runoff=0.4 cfs 0.062 af

Subcatchment A8: A8 Runoff Area=1,995 sf 37.24% Impervious Runoff Depth=5.20"
Flow Length=65' Slope=0.2000 '/' Tc=4.1 min CN=83 Runoff=0.2 cfs 0.020 af

Subcatchment A9: A9 Runoff Area=7,850 sf 84.62% Impervious Runoff Depth=6.47"
Flow Length=261' Tc=3.1 min CN=94 Runoff=1.1 cfs 0.097 af

Subcatchment B: B Runoff Area=4,770 sf 14.19% Impervious Runoff Depth=4.53"
Flow Length=181' Tc=12.7 min CN=77 Runoff=0.3 cfs 0.041 af

Subcatchment C: C Runoff Area=1,110 sf 0.00% Impervious Runoff Depth=4.20"
Flow Length=29' Slope=0.0100 '/' Tc=7.0 min CN=74 Runoff=0.1 cfs 0.009 af

Subcatchment D: D Runoff Area=4,743 sf 48.20% Impervious Runoff Depth=5.54"
Flow Length=49' Slope=0.0100 '/' Tc=10.7 min CN=86 Runoff=0.4 cfs 0.050 af

Reach R1: R1 Avg. Flow Depth=0.49' Max Vel=5.46 fps Inflow=4.4 cfs 0.665 af
n=0.040 L=90.0' S=0.1083 '/' Capacity=19.4 cfs Outflow=4.4 cfs 0.665 af

Reach R2: R2 Avg. Flow Depth=0.07' Max Vel=1.35 fps Inflow=0.1 cfs 0.005 af
n=0.040 L=141.0' S=0.0787 '/' Capacity=16.6 cfs Outflow=0.1 cfs 0.005 af

Reach R3: R3 Avg. Flow Depth=0.58' Max Vel=3.17 fps Inflow=3.2 cfs 0.787 af
n=0.040 L=5.0' S=0.0300 '/' Capacity=10.2 cfs Outflow=3.2 cfs 0.787 af

Reach R4: R4 Avg. Flow Depth=0.85' Max Vel=4.29 fps Inflow=7.8 cfs 1.509 af
n=0.040 L=50.0' S=0.0350 '/' Capacity=11.0 cfs Outflow=7.8 cfs 1.509 af

Reach R5: R5 Avg. Flow Depth=0.37' Max Vel=4.38 fps Inflow=2.3 cfs 0.650 af
n=0.040 L=164.0' S=0.0994 '/' Capacity=18.6 cfs Outflow=2.3 cfs 0.650 af

Pond DP1: DP1 Peak Elev=43.65' Storage=2,095 cf Inflow=4.7 cfs 0.577 af
Outflow=4.3 cfs 0.577 af

Pond DP2: DP2 Peak Elev=41.09' Storage=2,690 cf Inflow=4.3 cfs 0.577 af
Outflow=2.1 cfs 0.576 af

Pond Ex. Pipe A: Ex. Pipe A Peak Elev=20.36' Storage=431 cf Inflow=8.4 cfs 1.624 af
Primary=5.3 cfs 1.542 af Secondary=3.1 cfs 0.082 af Outflow=8.4 cfs 1.624 af

Pond PCB1: PCB1 Peak Elev=53.73' Inflow=1.5 cfs 0.186 af
15.0" Round Culvert n=0.012 L=44.0' S=0.0261 '/' Outflow=1.5 cfs 0.186 af

Pond PCB2: PCB2 Peak Elev=52.98' Inflow=3.0 cfs 0.357 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0100 '/' Outflow=3.0 cfs 0.357 af

Pond PCB3: PCB3 Peak Elev=52.62' Inflow=3.7 cfs 0.447 af
15.0" Round Culvert n=0.012 L=78.0' S=0.0910 '/' Outflow=3.7 cfs 0.447 af

Pond PCB4: PCB4 Peak Elev=44.02' Inflow=0.5 cfs 0.077 af
12.0" Round Culvert n=0.012 L=20.0' S=0.0100 '/' Outflow=0.5 cfs 0.077 af

Pond PCB5: PCB5 Peak Elev=39.16' Inflow=2.3 cfs 0.650 af
15.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=2.3 cfs 0.650 af

Pond PDMH1: PDMH1 Peak Elev=44.11' Inflow=4.3 cfs 0.500 af
15.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=4.3 cfs 0.500 af

Pond PP1: Porous Pave 1 Peak Elev=60.07' Storage=353 cf Inflow=0.6 cfs 0.058 af
6.0" Round Culvert n=0.012 L=30.0' S=0.1933 '/' Outflow=0.4 cfs 0.055 af

Pond PP2: Porous Pave 2 Peak Elev=53.52' Storage=344 cf Inflow=0.6 cfs 0.051 af
6.0" Round Culvert n=0.012 L=5.0' S=0.0700 '/' Outflow=0.3 cfs 0.049 af

Pond PP3: Porous Pave 3 Peak Elev=44.54' Storage=463 cf Inflow=0.9 cfs 0.080 af
6.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.5 cfs 0.077 af

Pond RD1: RD1 Peak Elev=64.63' Inflow=0.3 cfs 0.025 af
8.0" Round Culvert n=0.012 L=83.0' S=0.0373 '/' Outflow=0.3 cfs 0.025 af

Pond RD2: RD2 Peak Elev=55.34' Inflow=0.3 cfs 0.026 af
8.0" Round Culvert n=0.012 L=83.0' S=0.0120 '/' Outflow=0.3 cfs 0.026 af

Pond RD3: RD3 Peak Elev=70.01' Inflow=0.5 cfs 0.052 af
8.0" Round Culvert n=0.012 L=235.0' S=0.0660 '/' Outflow=0.5 cfs 0.052 af

Pond RD4: RD4 Peak Elev=54.33' Inflow=0.3 cfs 0.025 af
8.0" Round Culvert n=0.012 L=83.0' S=0.0157 '/' Outflow=0.3 cfs 0.025 af

Pond RD5: RD5 Peak Elev=55.33' Inflow=0.3 cfs 0.025 af
8.0" Round Culvert n=0.012 L=74.0' S=0.0311 '/' Outflow=0.3 cfs 0.025 af

Pond RD6: RD6 Peak Elev=46.09' Inflow=0.3 cfs 0.026 af
8.0" Round Culvert n=0.012 L=75.0' S=0.0100 '/' Outflow=0.3 cfs 0.026 af

Pond RD7: RD7 Peak Elev=44.69' Inflow=0.3 cfs 0.026 af
8.0" Round Culvert n=0.012 L=95.0' S=0.0100 '/' Outflow=0.3 cfs 0.026 af

Pond YD1: YD1 Peak Elev=63.90' Storage=0 cf Inflow=0.4 cfs 0.088 af
12.0" Round Culvert n=0.012 L=52.0' S=0.0962 '/' Outflow=0.4 cfs 0.088 af

Total Runoff Area = 3.925 ac Runoff Volume = 1.734 af Average Runoff Depth = 5.30"
57.51% Pervious = 2.257 ac 42.49% Impervious = 1.668 ac

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A – 2

10-YR STORM SUMMARY

Summary for Subcatchment A1: A1

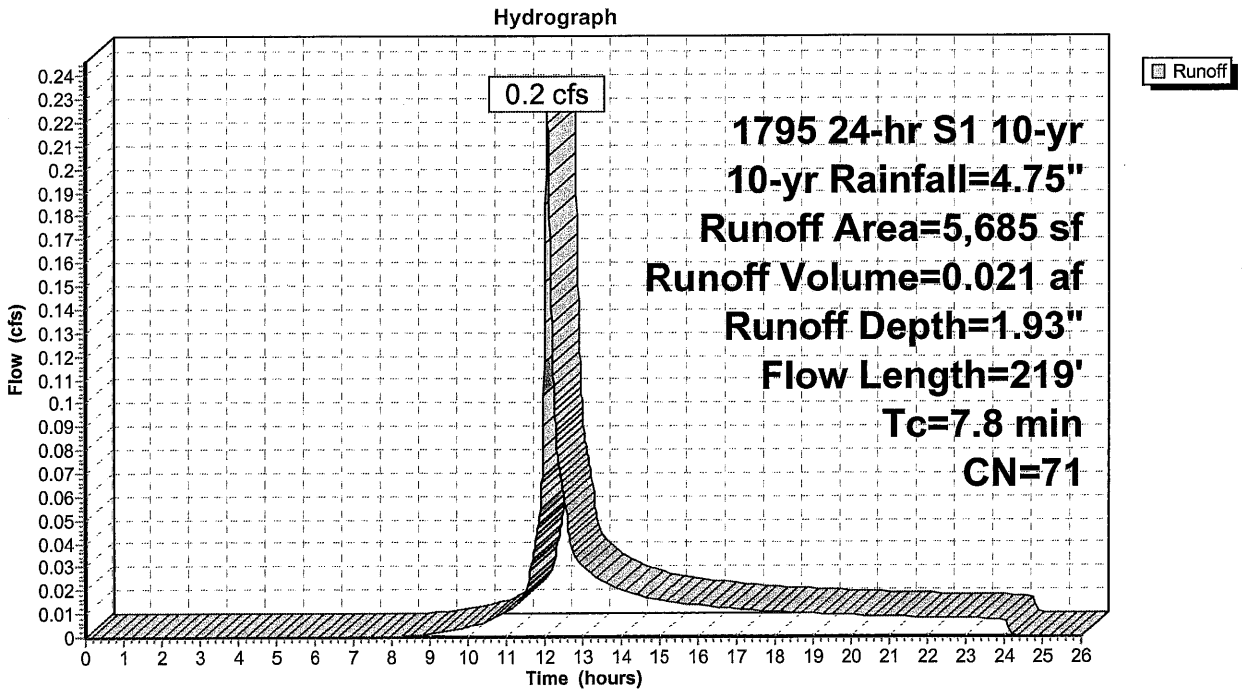
Runoff = 0.2 cfs @ 12.06 hrs, Volume= 0.021 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
4,413	70	Woods, Good, HSG C
1,218	74	>75% Grass cover, Good, HSG C
54	98	Unconnected pavement, HSG C
5,685	71	Weighted Average
5,631		99.05% Pervious Area
54		0.95% Impervious Area
54		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	75	0.2000	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.15"
0.2	39	0.3590	3.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	105	0.0900	2.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.8	219	Total			

Subcatchment A1: A1



Summary for Subcatchment A10: A10

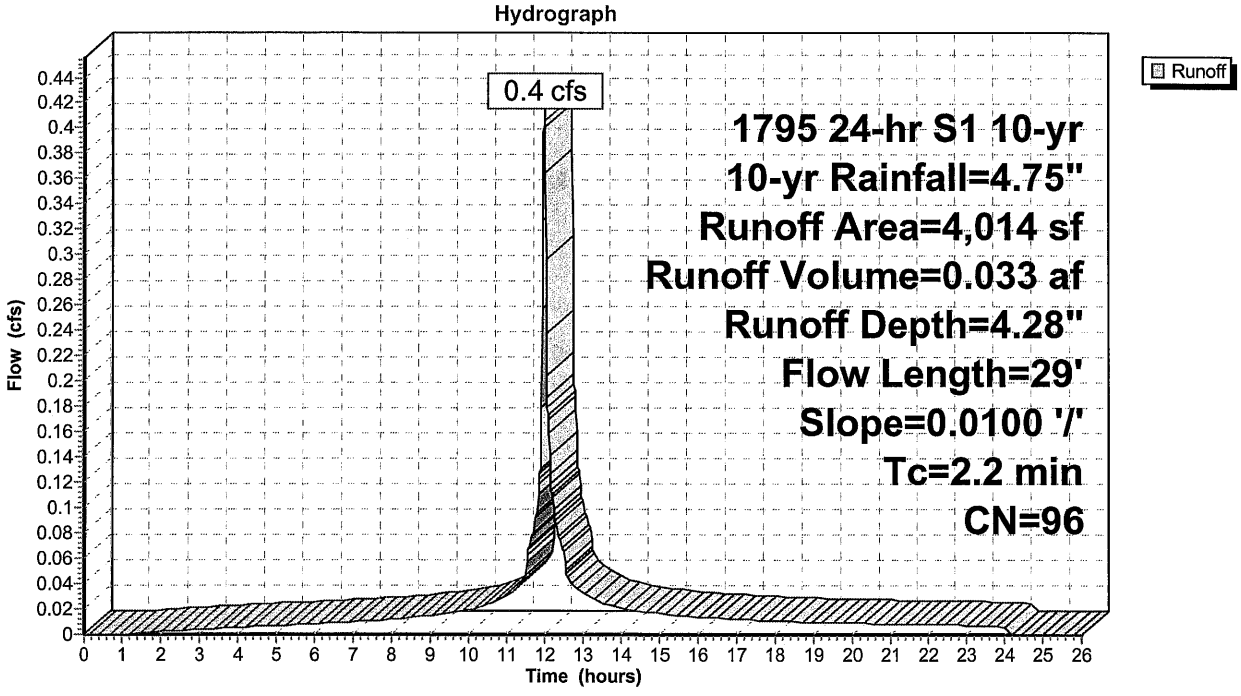
Runoff = 0.4 cfs @ 12.00 hrs, Volume= 0.033 af, Depth= 4.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
336	74	>75% Grass cover, Good, HSG C
3,678	98	Paved parking, HSG C
4,014	96	Weighted Average
336		8.37% Pervious Area
3,678		91.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	6	0.0100	0.05		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
0.2	23	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.2	29	Total			

Subcatchment A10: A10



Summary for Subcatchment A11: A11

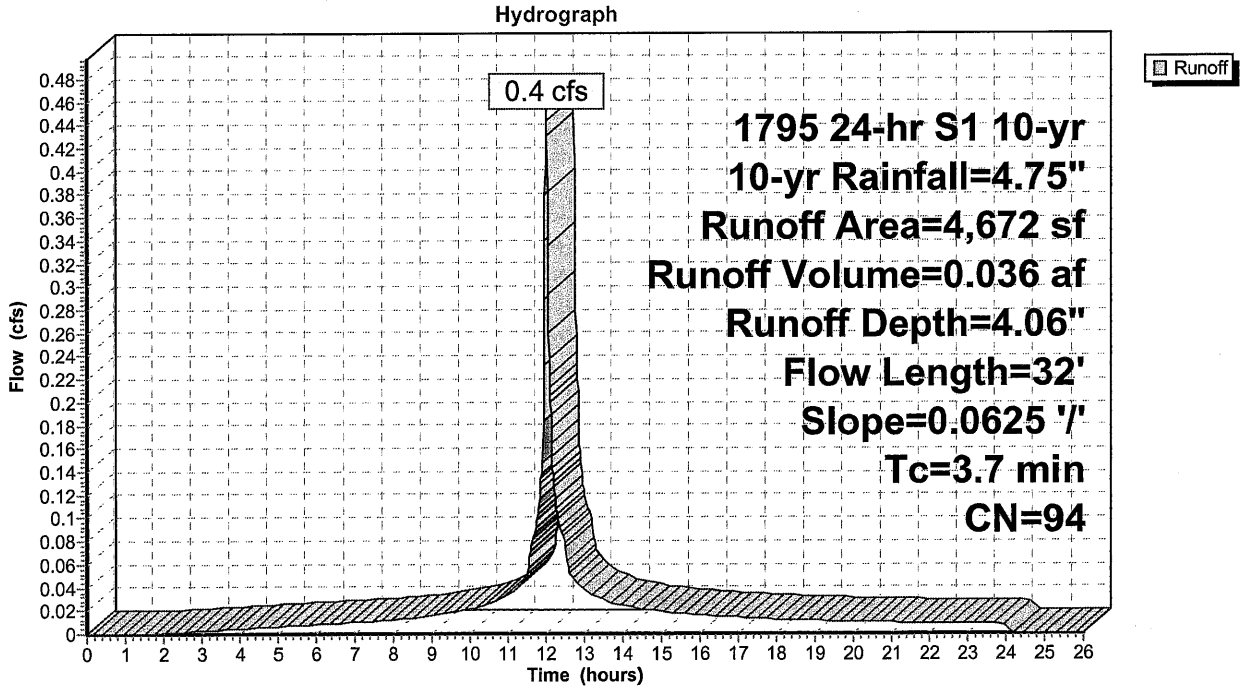
Runoff = 0.4 cfs @ 12.01 hrs, Volume= 0.036 af, Depth= 4.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
740	74	>75% Grass cover, Good, HSG C
3,932	98	Paved parking, HSG C
4,672	94	Weighted Average
740		15.84% Pervious Area
3,932		84.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	32	0.0625	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"

Subcatchment A11: A11



Summary for Subcatchment A12: A12

[49] Hint: Tc<2dt may require smaller dt

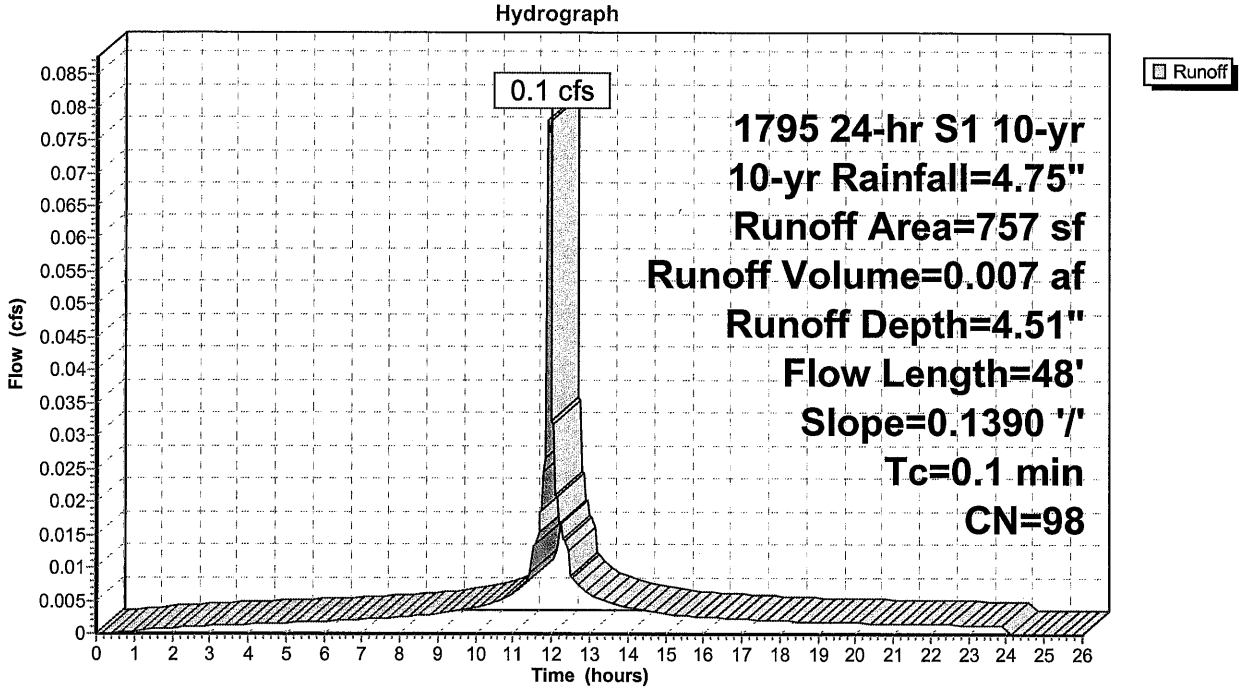
Runoff = 0.1 cfs @ 11.99 hrs, Volume= 0.007 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
757	98	Paved parking, HSG C
757		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	48	0.1390	7.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps

Subcatchment A12: A12



Summary for Subcatchment A13: A13

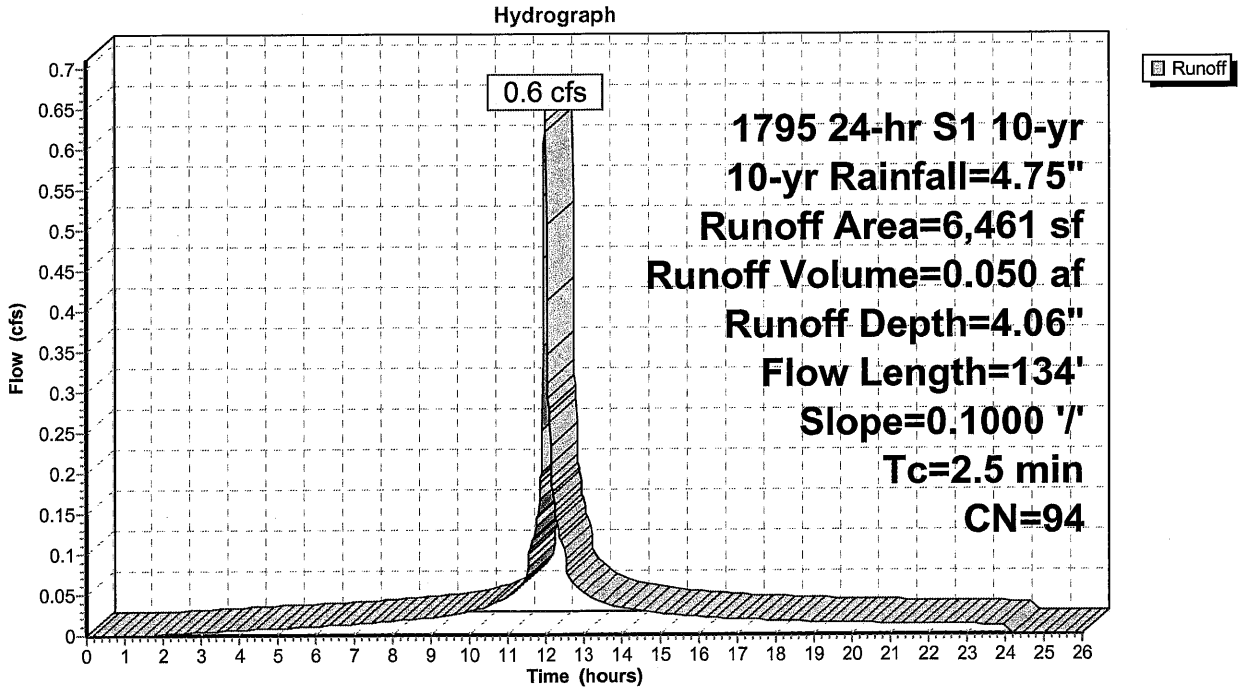
Runoff = 0.6 cfs @ 12.00 hrs, Volume= 0.050 af, Depth= 4.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
1,156	74	>75% Grass cover, Good, HSG C
5,305	98	Paved parking, HSG C
6,461	94	Weighted Average
1,156		17.89% Pervious Area
5,305		82.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	21	0.1000	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
0.3	113	0.1000	6.42		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.5	134	Total			

Subcatchment A13: A13



Summary for Subcatchment A14: A14

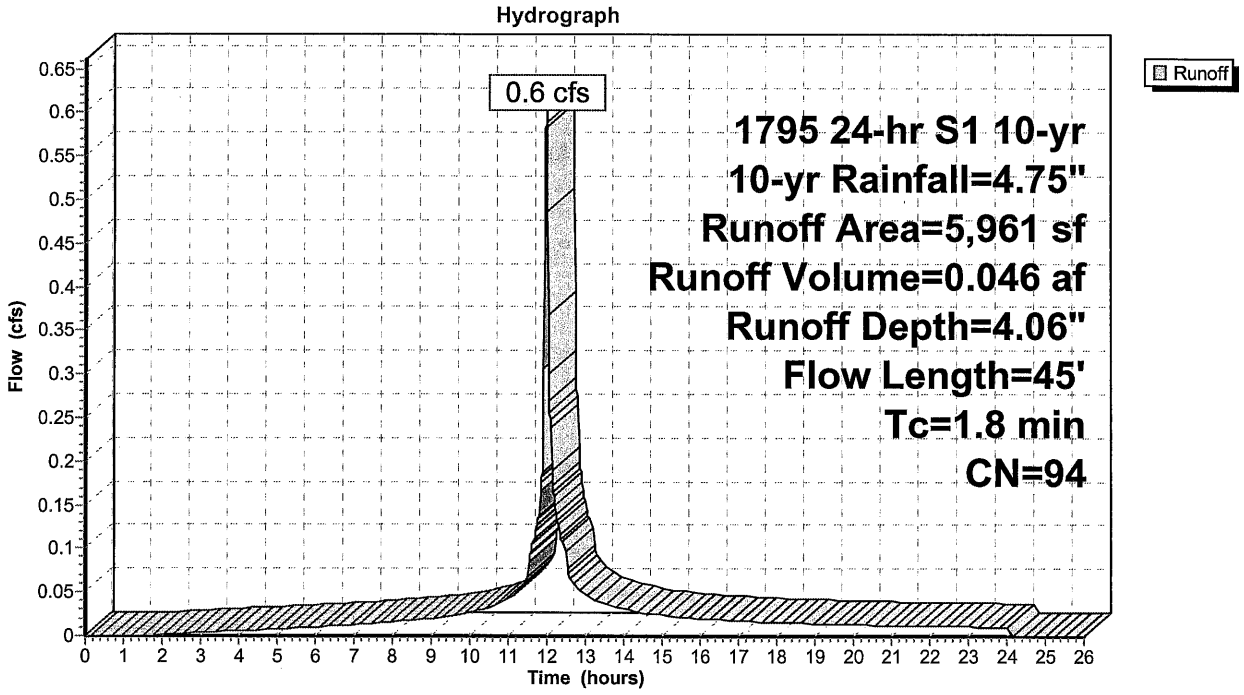
Runoff = 0.6 cfs @ 12.00 hrs, Volume= 0.046 af, Depth= 4.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
985	74	>75% Grass cover, Good, HSG C
4,976	98	Paved parking, HSG C
5,961	94	Weighted Average
985		16.52% Pervious Area
4,976		83.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	5	0.0100	0.05		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
0.1	40	0.0500	4.54		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.8	45	Total			

Subcatchment A14: A14



Summary for Subcatchment A15: A15

[49] Hint: Tc<2dt may require smaller dt

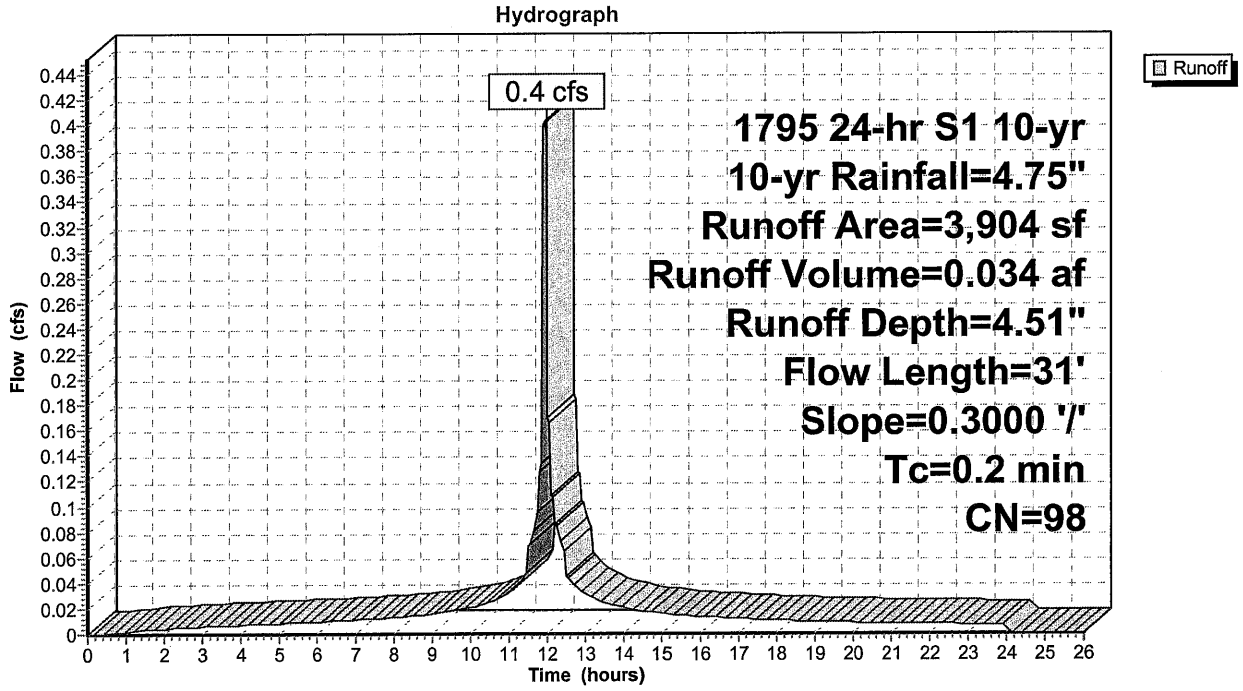
Runoff = 0.4 cfs @ 11.99 hrs, Volume= 0.034 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
3,904	98	Roofs, HSG C
3,904		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	31	0.3000	3.19		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.15"

Subcatchment A15: A15



Summary for Subcatchment A16: A16

[49] Hint: Tc<2dt may require smaller dt

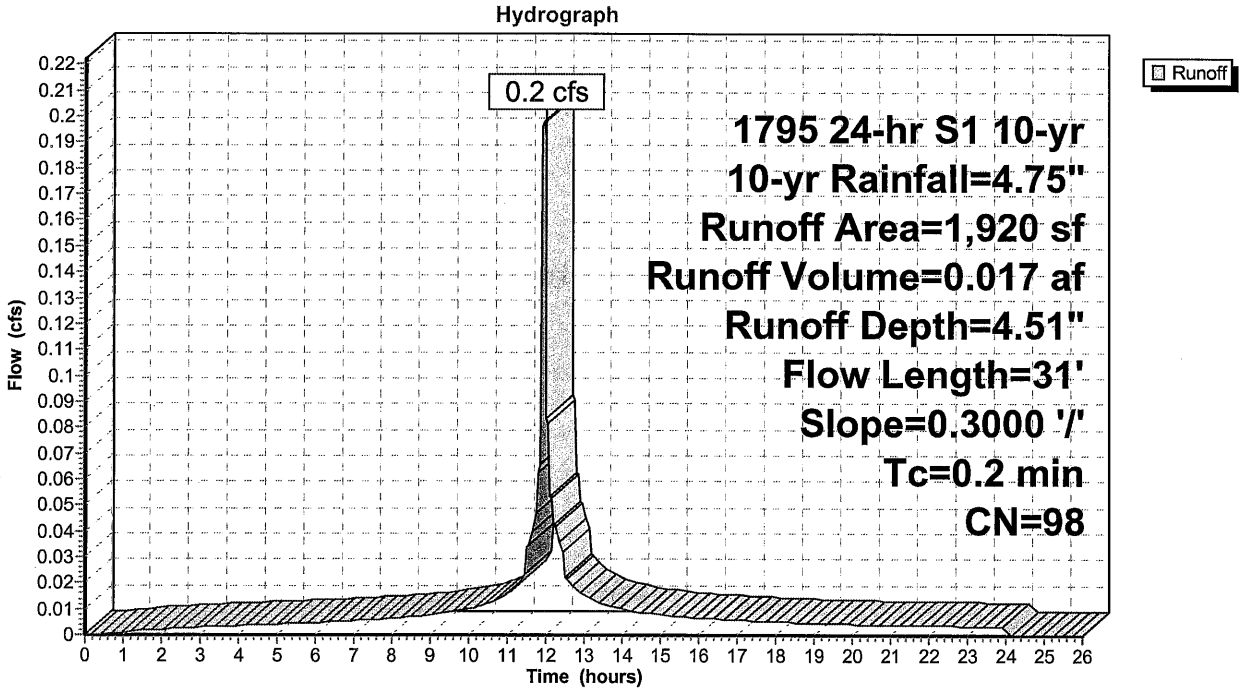
Runoff = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
1,920	98	Roofs, HSG C
1,920		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	31	0.3000	3.19		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.15"

Subcatchment A16: A16



Summary for Subcatchment A17: A17

[49] Hint: Tc<2dt may require smaller dt

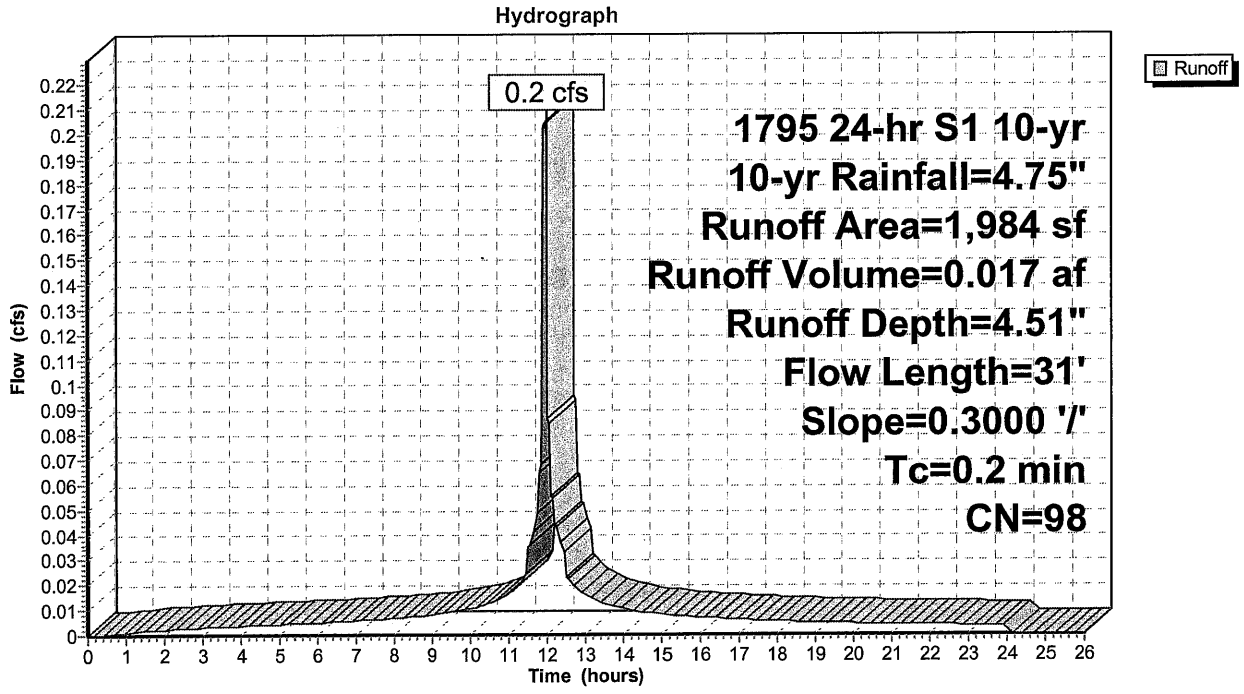
Runoff = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
1,984	98	Roofs, HSG C
1,984		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	31	0.3000	3.19		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.15"

Subcatchment A17: A17



Summary for Subcatchment A18: A18

[49] Hint: Tc<2dt may require smaller dt

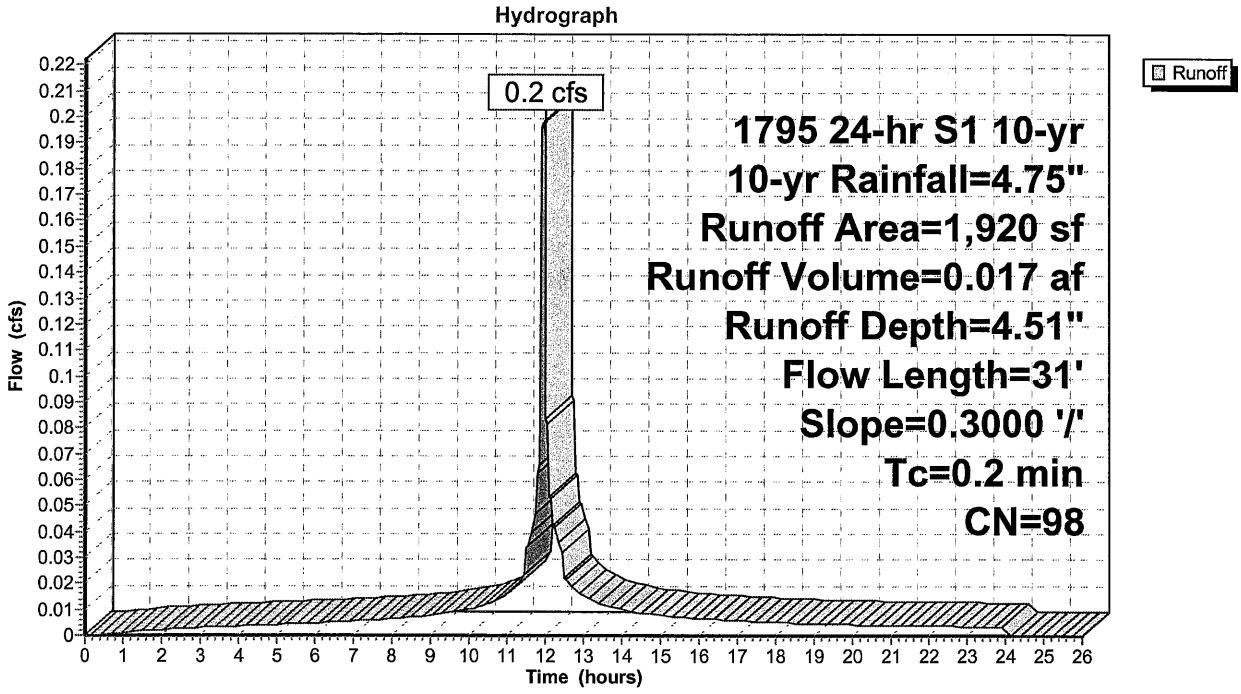
Runoff = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
1,920	98	Roofs, HSG C
1,920		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	31	0.3000	3.19		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.15"

Subcatchment A18: A18



Summary for Subcatchment A19: A19

[49] Hint: Tc<2dt may require smaller dt

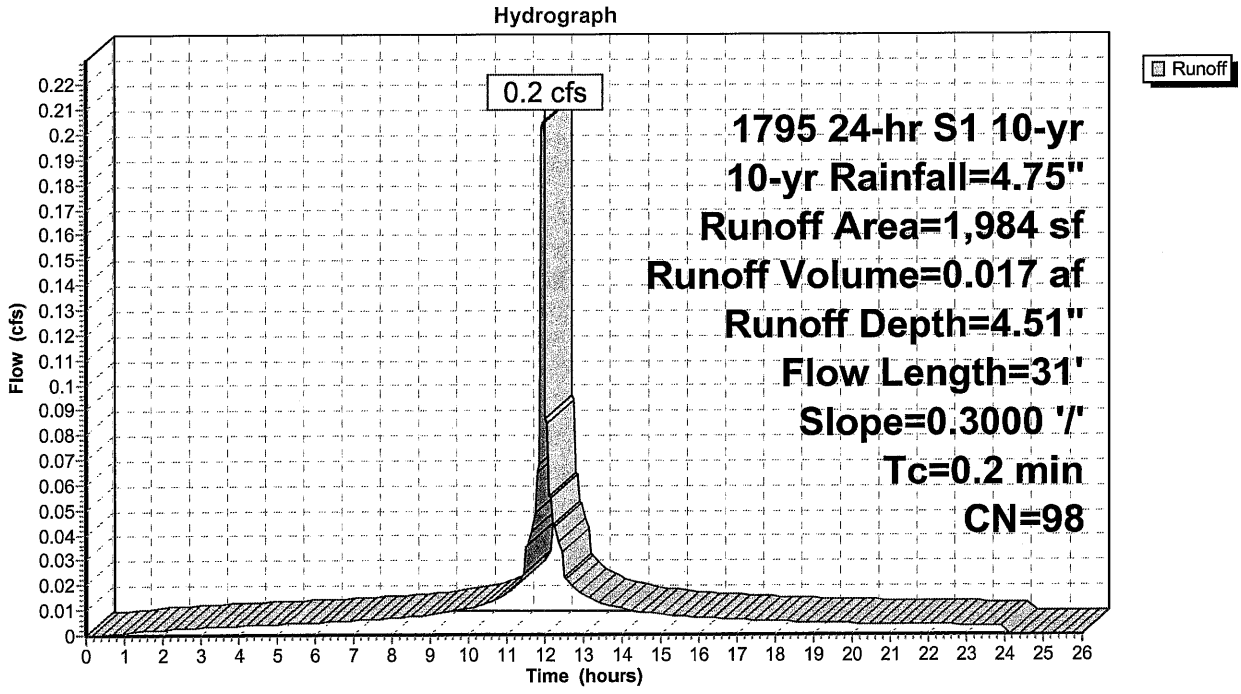
Runoff = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
1,984	98	Roofs, HSG C
1,984		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	31	0.3000	3.19		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.15"

Subcatchment A19: A19



Summary for Subcatchment A2: A2

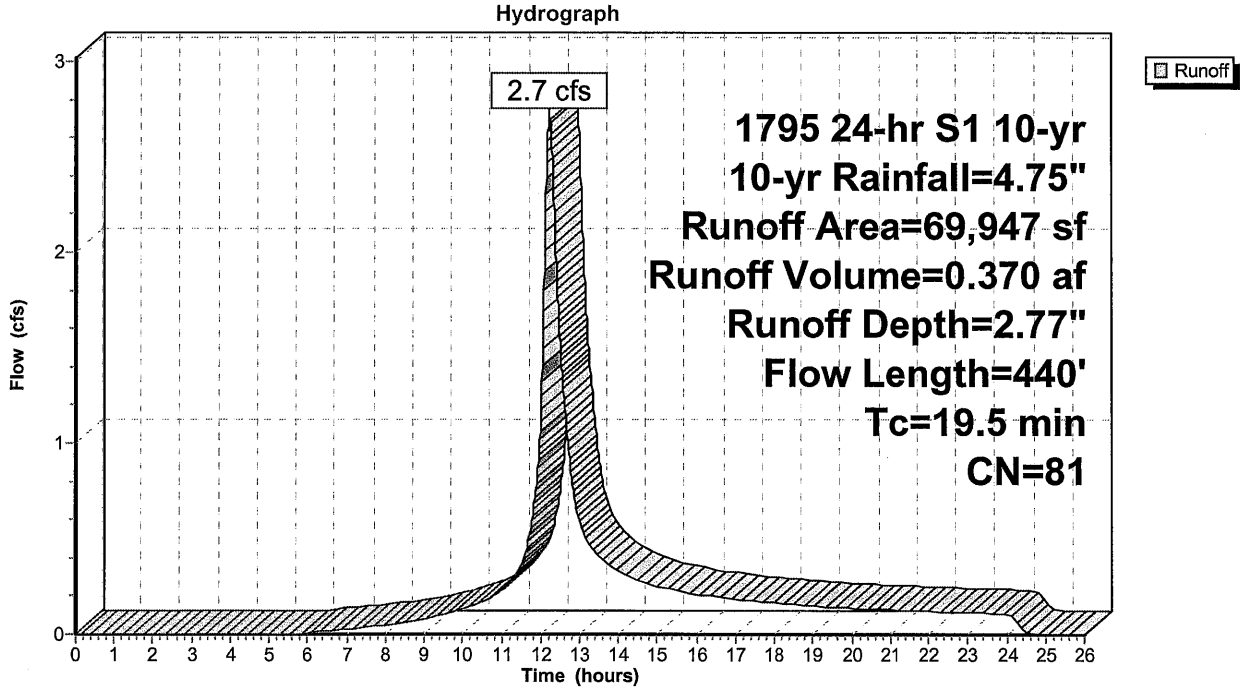
Runoff = 2.7 cfs @ 12.22 hrs, Volume= 0.370 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
48,923	79	1 acre lots, 20% imp, HSG C
10,353	83	1/4 acre lots, 38% imp, HSG C
10,671	90	1/8 acre lots, 65% imp, HSG C
69,947	81	Weighted Average
49,292		70.47% Pervious Area
20,655		29.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	100	0.0150	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
3.4	340	0.1100	1.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
19.5	440	Total			

Subcatchment A2: A2



Summary for Subcatchment A20: A20

[49] Hint: Tc<2dt may require smaller dt

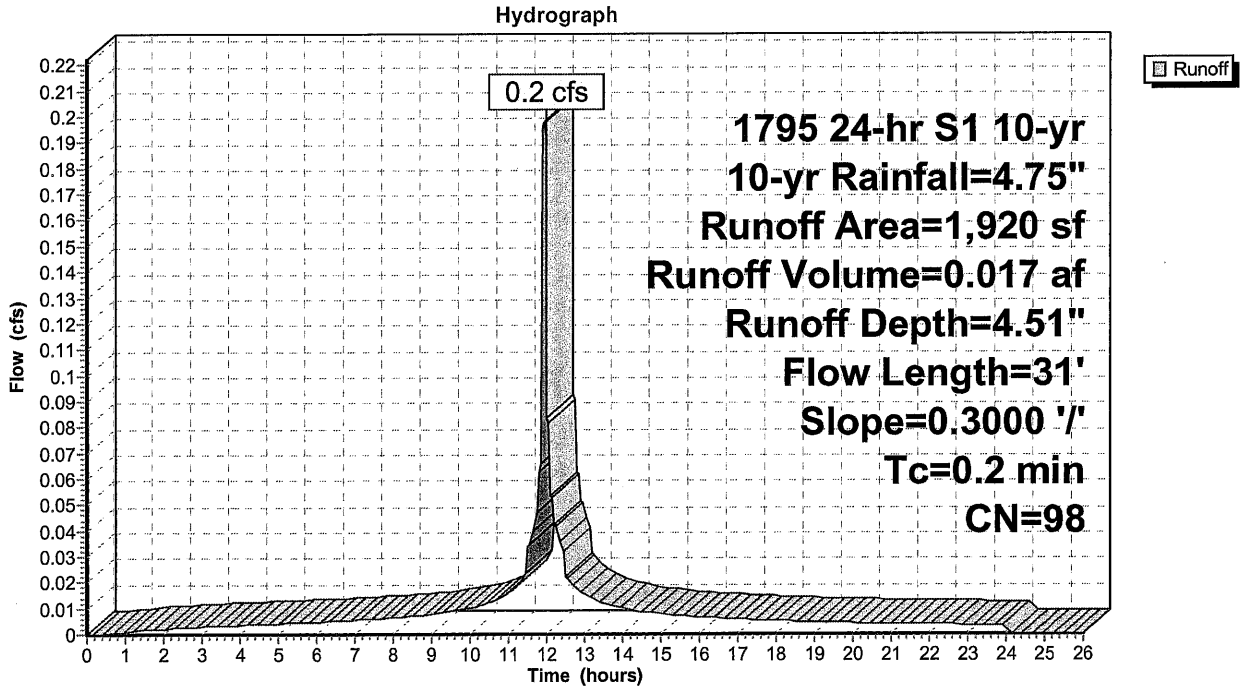
Runoff = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
1,920	98	Roofs, HSG C
1,920		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	31	0.3000	3.19		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.15"

Subcatchment A20: A20



Summary for Subcatchment A21: A21

[49] Hint: Tc<2dt may require smaller dt

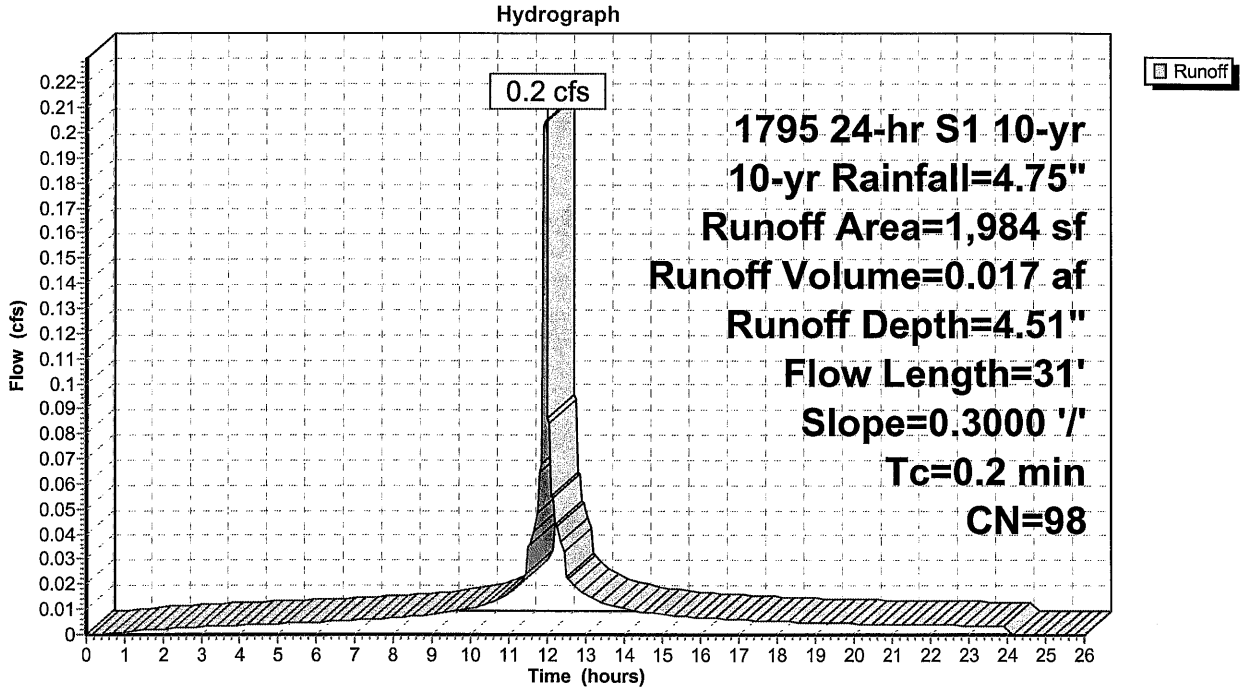
Runoff = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
1,984	98	Roofs, HSG C
1,984		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	31	0.3000	3.19		**Sheet Flow, Roof** Smooth surfaces n= 0.011 P2= 3.15"

Subcatchment A21: A21



Summary for Subcatchment A3: A3

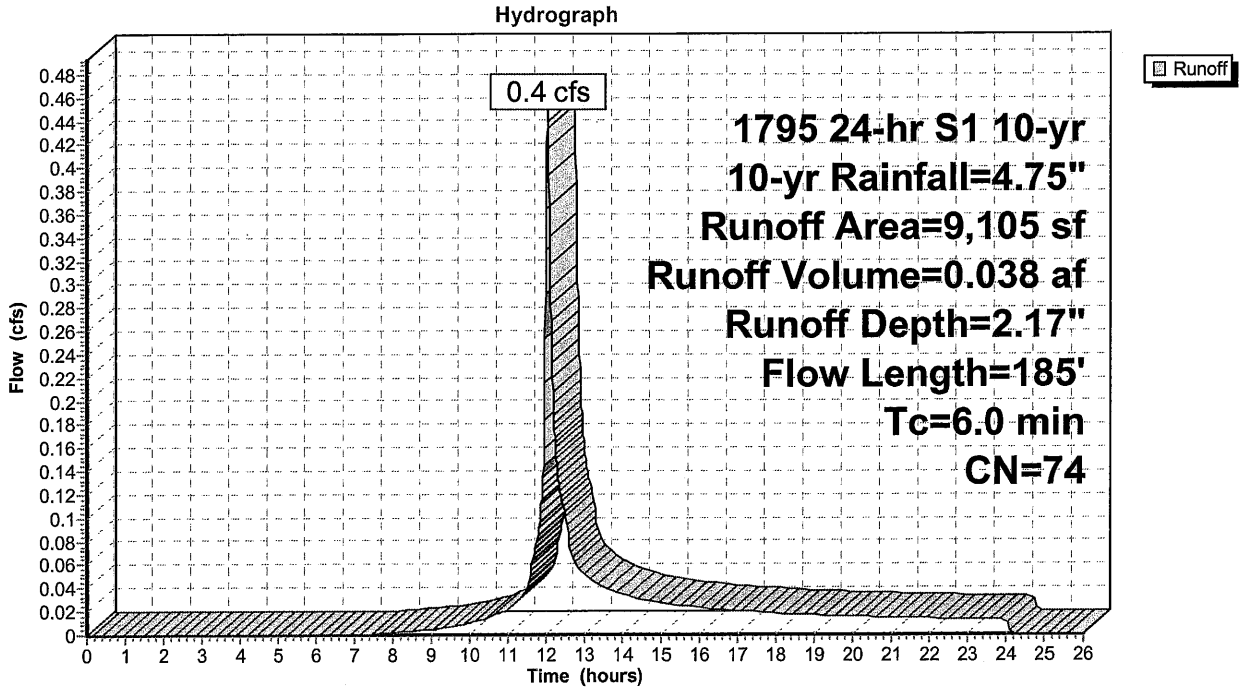
Runoff = 0.4 cfs @ 12.04 hrs, Volume= 0.038 af, Depth= 2.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
5,174	70	Woods, Good, HSG C
2,863	77	Woods, Good, HSG D
537	80	>75% Grass cover, Good, HSG D
531	98	Unconnected pavement, HSG C
9,105	74	Weighted Average
8,574		94.17% Pervious Area
531		5.83% Impervious Area
531		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	61	0.2050	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.15"
0.3	124	0.1010	7.78	15.57	**Parabolic Channel,** W=3.00' D=1.00' Area=2.0 sf Perim=3.7' n= 0.040 Winding stream, pools & shoals
6.0	185	Total			

Subcatchment A3: A3



Summary for Subcatchment A4: A4

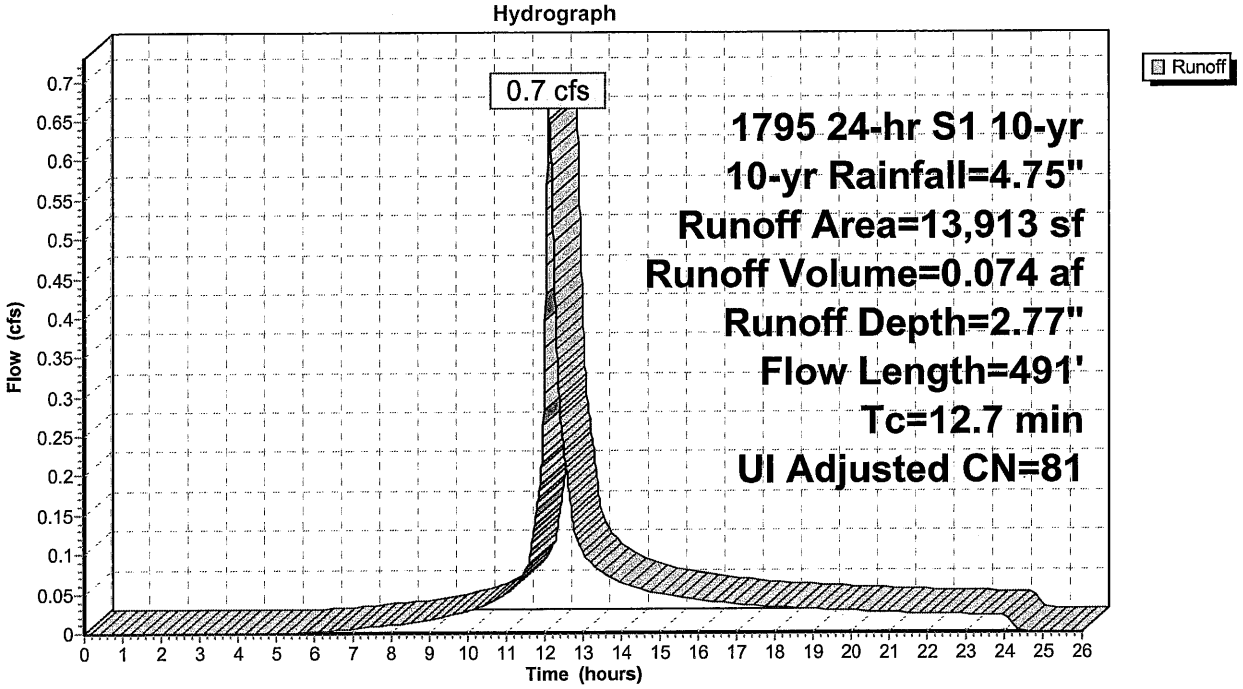
Runoff = 0.7 cfs @ 12.12 hrs, Volume= 0.074 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
7,236	74	>75% Grass cover, Good, HSG C
5,444	90	1/8 acre lots, 65% imp, HSG C
671	80	>75% Grass cover, Good, HSG D
562	98	Unconnected pavement, HSG C
13,913	82	Weighted Average, UI Adjusted CN = 81
9,812		70.53% Pervious Area
4,101		29.47% Impervious Area
562		13.71% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	75	0.0270	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
2.4	325	0.1050	2.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	91	0.1040	7.90	15.80	**Parabolic Channel,** W=3.00' D=1.00' Area=2.0 sf Perim=3.7' n= 0.040 Winding stream, pools & shoals
12.7	491	Total			

Subcatchment A4: A4



Summary for Subcatchment A5: A5

[49] Hint: Tc<2dt may require smaller dt

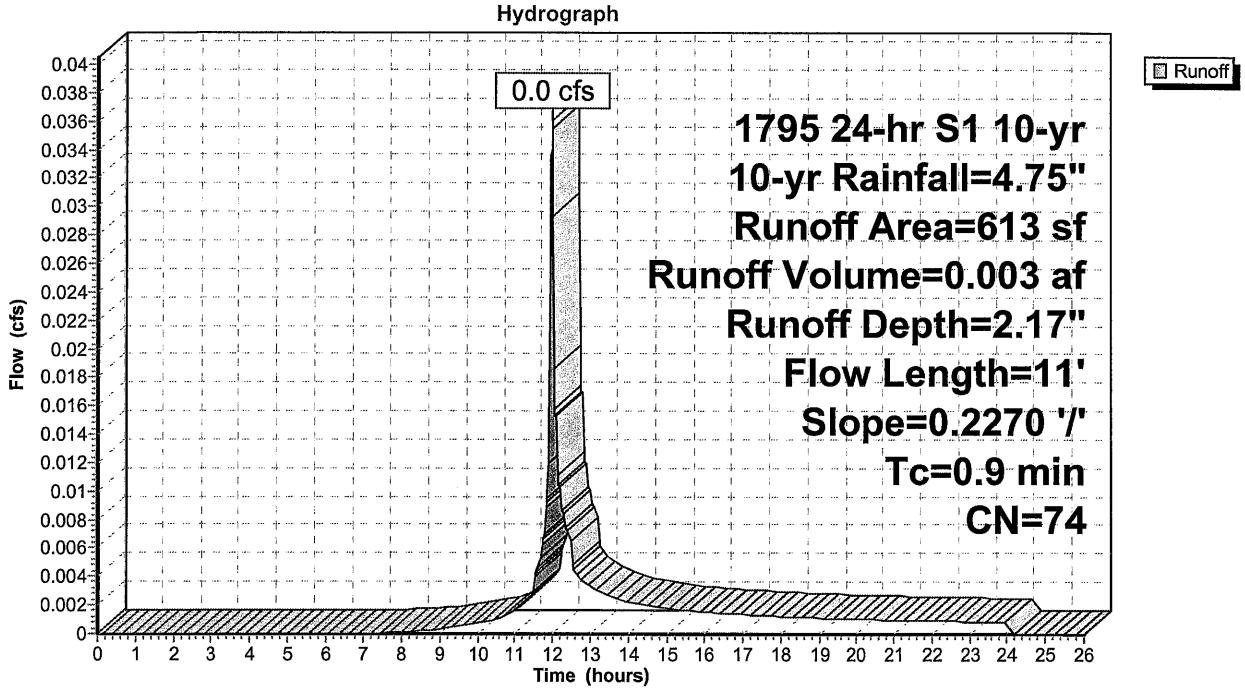
Runoff = 0.0 cfs @ 12.00 hrs, Volume= 0.003 af, Depth= 2.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
613	74	>75% Grass cover, Good, HSG C
613		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	11	0.2270	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"

Subcatchment A5: A5



Summary for Subcatchment A6: A6

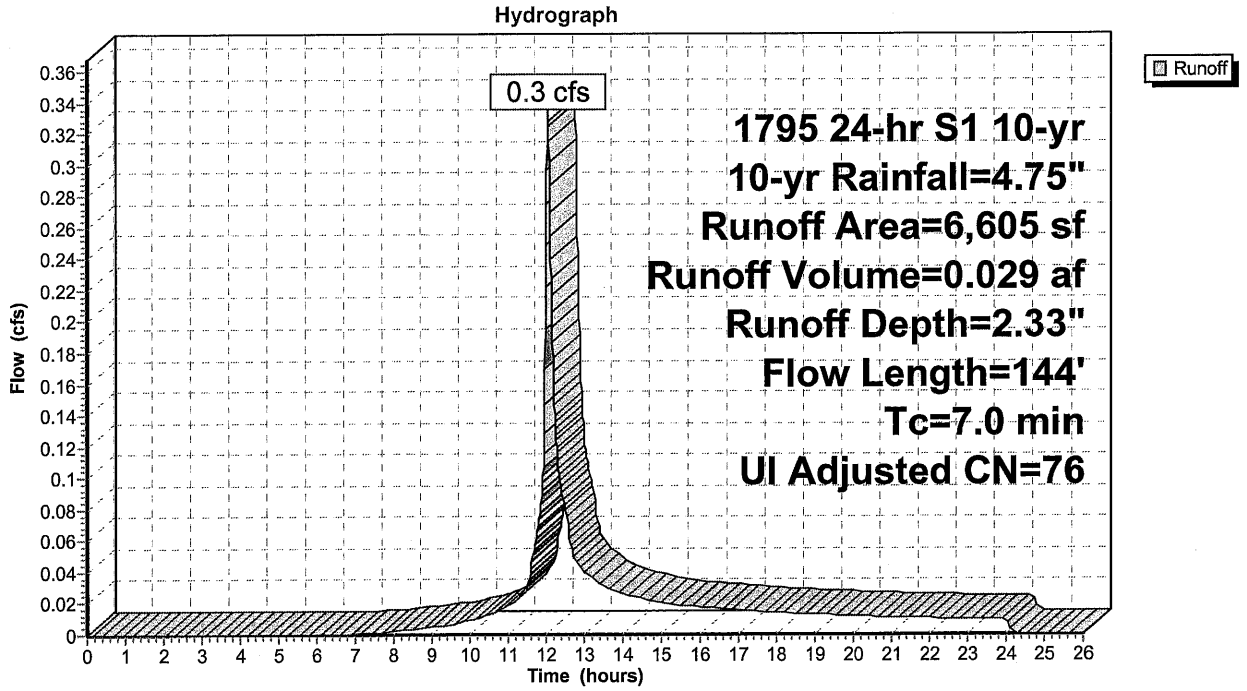
Runoff = 0.3 cfs @ 12.05 hrs, Volume= 0.029 af, Depth= 2.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
5,611	74	>75% Grass cover, Good, HSG C
994	98	Unconnected roofs, HSG C
6,605	78	Weighted Average, UI Adjusted CN = 76
5,611		84.95% Pervious Area
994		15.05% Impervious Area
994		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.1380	0.25		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
0.4	44	0.0570	1.67		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.0	144	Total			

Subcatchment A6: A6



Summary for Subcatchment A7: A7

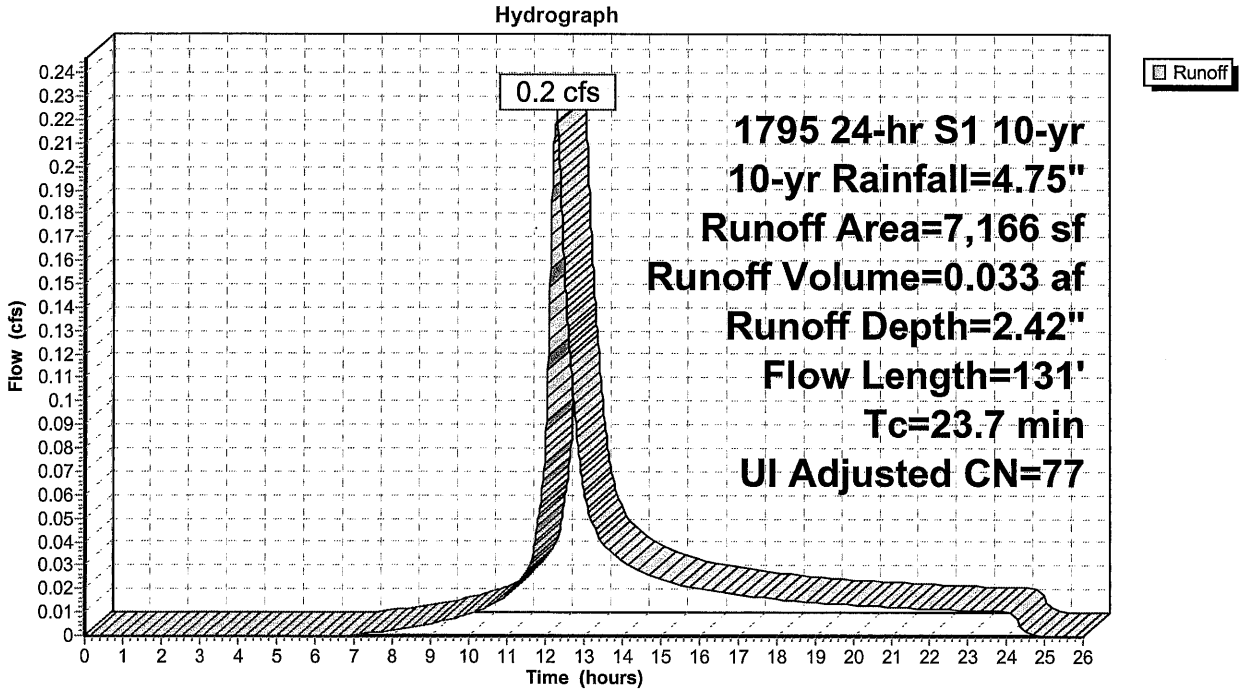
Runoff = 0.2 cfs @ 12.29 hrs, Volume= 0.033 af, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
2,205	70	Woods, Good, HSG C
3,251	74	>75% Grass cover, Good, HSG C
793	98	Unconnected roofs, HSG C
917	98	Paved parking, HSG C
7,166	78	Weighted Average, UI Adjusted CN = 77
5,456		76.14% Pervious Area
1,710		23.86% Impervious Area
793		46.37% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	23	0.0150	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
18.5	80	0.0190	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.15"
0.2	28	0.2140	2.31		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.7	131	Total			

Subcatchment A7: A7



Summary for Subcatchment A8: A8

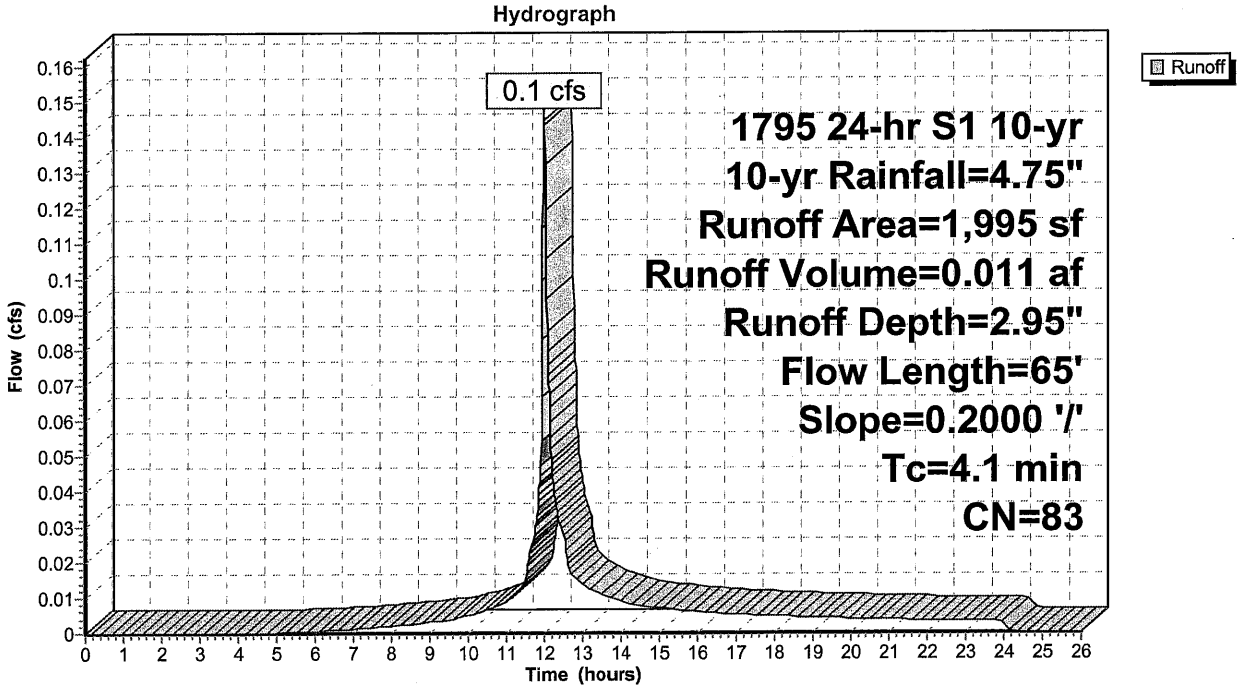
Runoff = 0.1 cfs @ 12.02 hrs, Volume= 0.011 af, Depth= 2.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
1,252	74	>75% Grass cover, Good, HSG C
743	98	Paved parking, HSG C
1,995	83	Weighted Average
1,252		62.76% Pervious Area
743		37.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	65	0.2000	0.27		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"

Subcatchment A8: A8



Summary for Subcatchment A9: A9

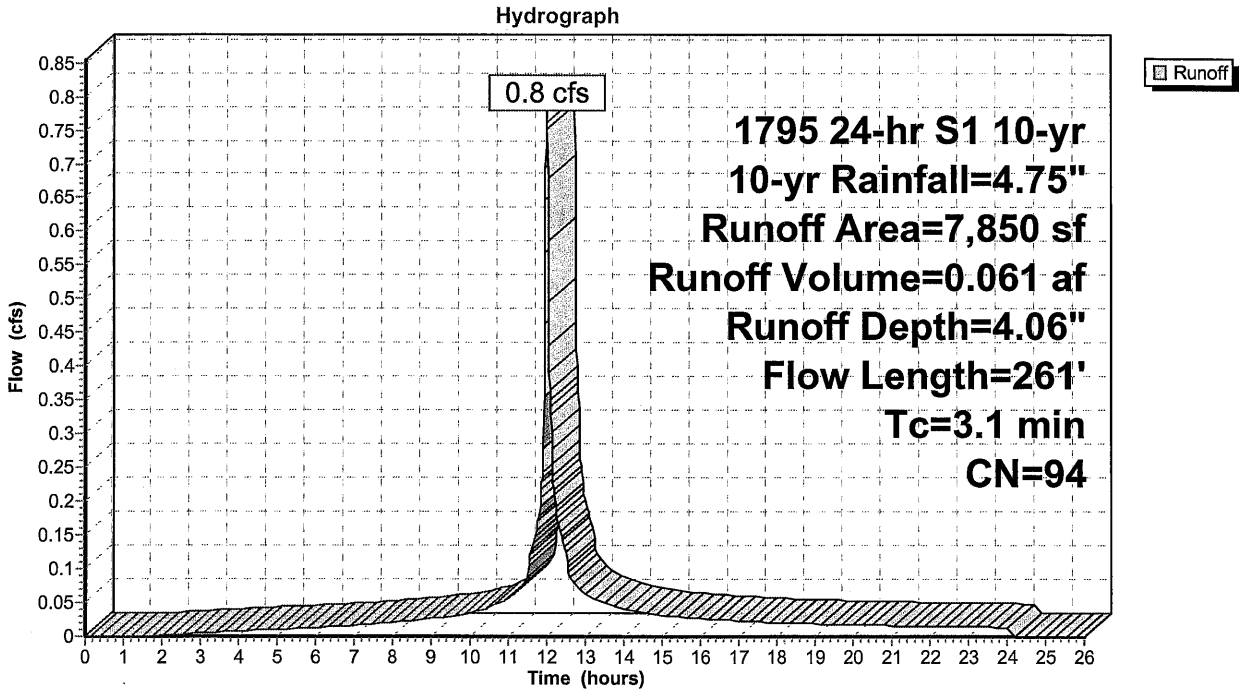
Runoff = 0.8 cfs @ 12.01 hrs, Volume= 0.061 af, Depth= 4.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
1,207	74	>75% Grass cover, Good, HSG C
1,081	98	Unconnected roofs, HSG C
5,562	98	Paved parking, HSG C
7,850	94	Weighted Average
1,207		15.38% Pervious Area
6,643		84.62% Impervious Area
1,081		16.27% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	7	0.0100	0.05		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
0.8	254	0.0620	5.05		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.1	261	Total			

Subcatchment A9: A9



Summary for Subcatchment B: B

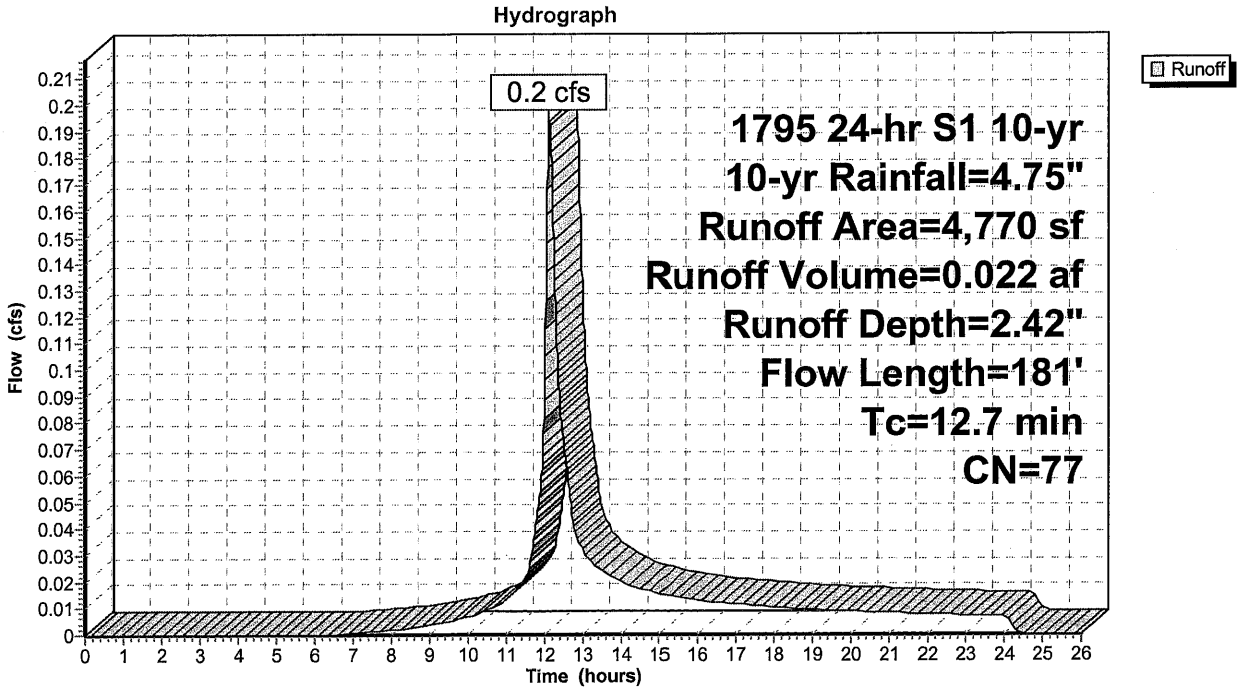
Runoff = 0.2 cfs @ 12.12 hrs, Volume= 0.022 af, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
4,093	74	>75% Grass cover, Good, HSG C
677	98	Paved parking, HSG C
4,770	77	Weighted Average
4,093		85.81% Pervious Area
677		14.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	80	0.0200	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"
0.7	101	0.1190	2.41		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.7	181	Total			

Subcatchment B: B



Summary for Subcatchment C: C

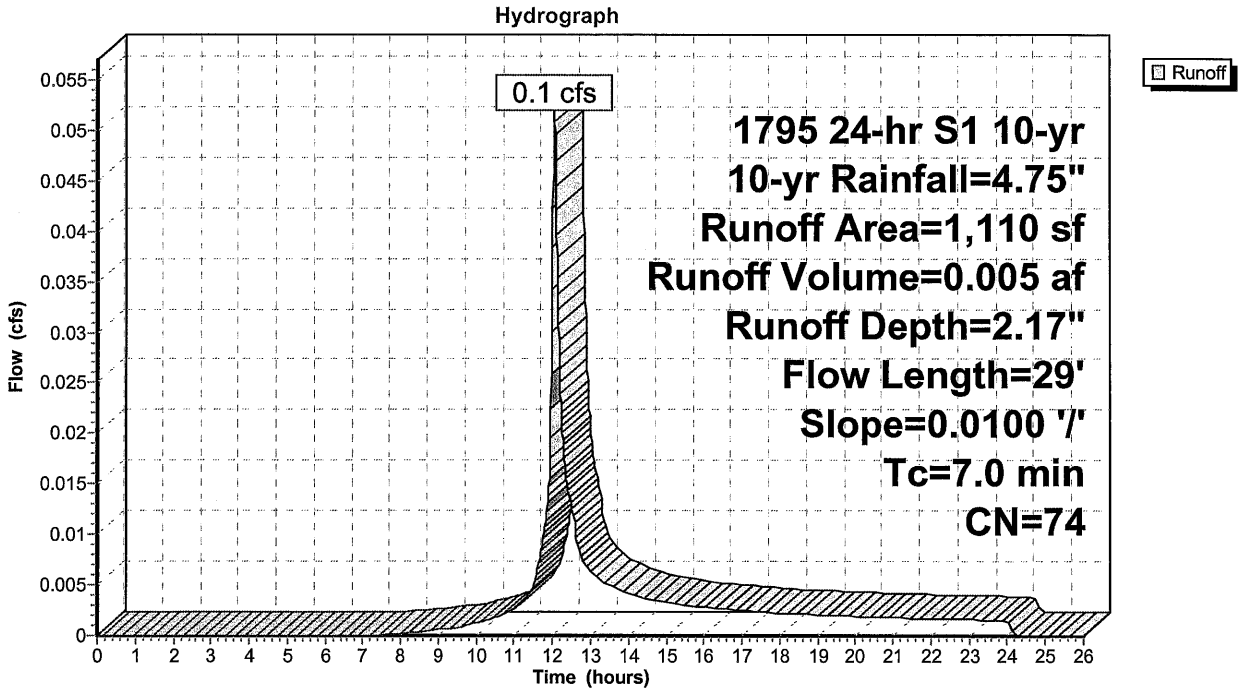
Runoff = 0.1 cfs @ 12.05 hrs, Volume= 0.005 af, Depth= 2.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
1,110	74	>75% Grass cover, Good, HSG C
1,110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	29	0.0100	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"

Subcatchment C: C



Summary for Subcatchment D: D

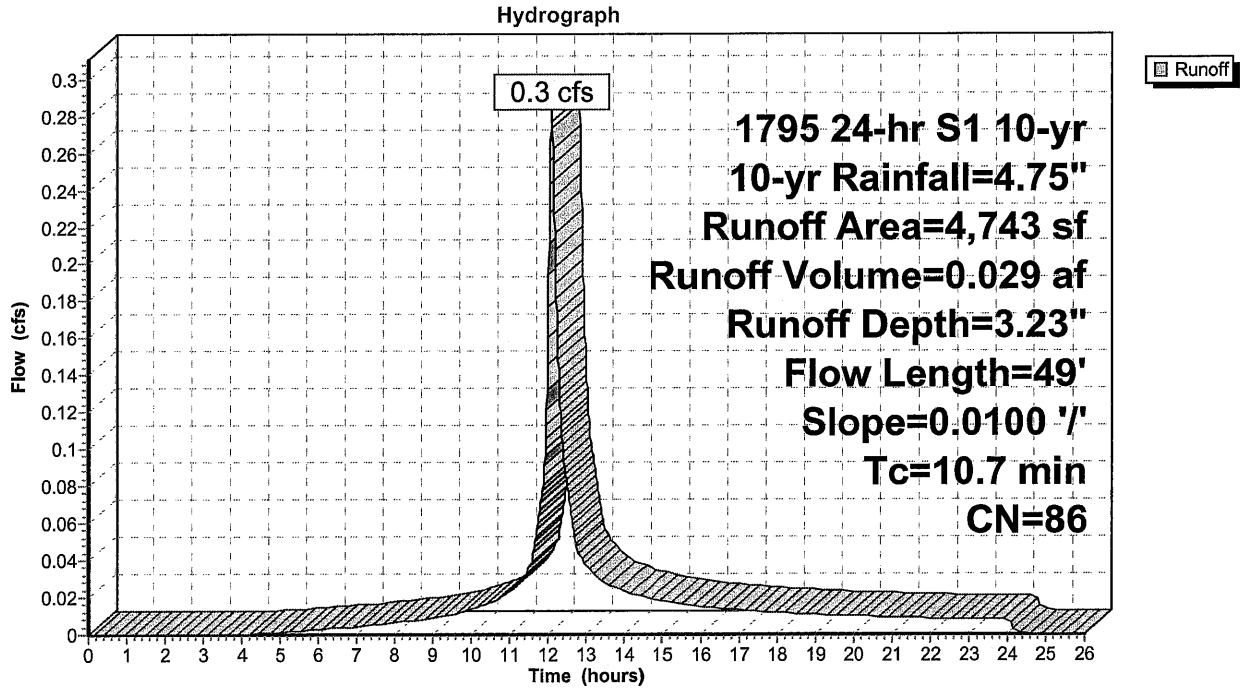
Runoff = 0.3 cfs @ 12.09 hrs, Volume= 0.029 af, Depth= 3.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
1795 24-hr S1 10-yr 10-yr Rainfall=4.75"

Area (sf)	CN	Description
2,457	74	>75% Grass cover, Good, HSG C
782	98	Unconnected roofs, HSG C
1,504	98	Paved parking, HSG C
4,743	86	Weighted Average
2,457		51.80% Pervious Area
2,286		48.20% Impervious Area
782		34.21% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	49	0.0100	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.15"

Subcatchment D: D



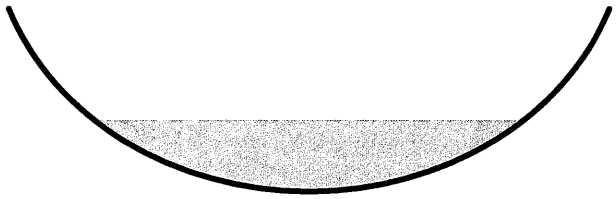
Summary for Reach R1: R1

Inflow Area = 1.606 ac, 29.53% Impervious, Inflow Depth = 2.77" for 10-yr event
Inflow = 2.7 cfs @ 12.22 hrs, Volume= 0.370 af
Outflow = 2.7 cfs @ 12.22 hrs, Volume= 0.370 af, Atten= 0%, Lag= 0.1 min

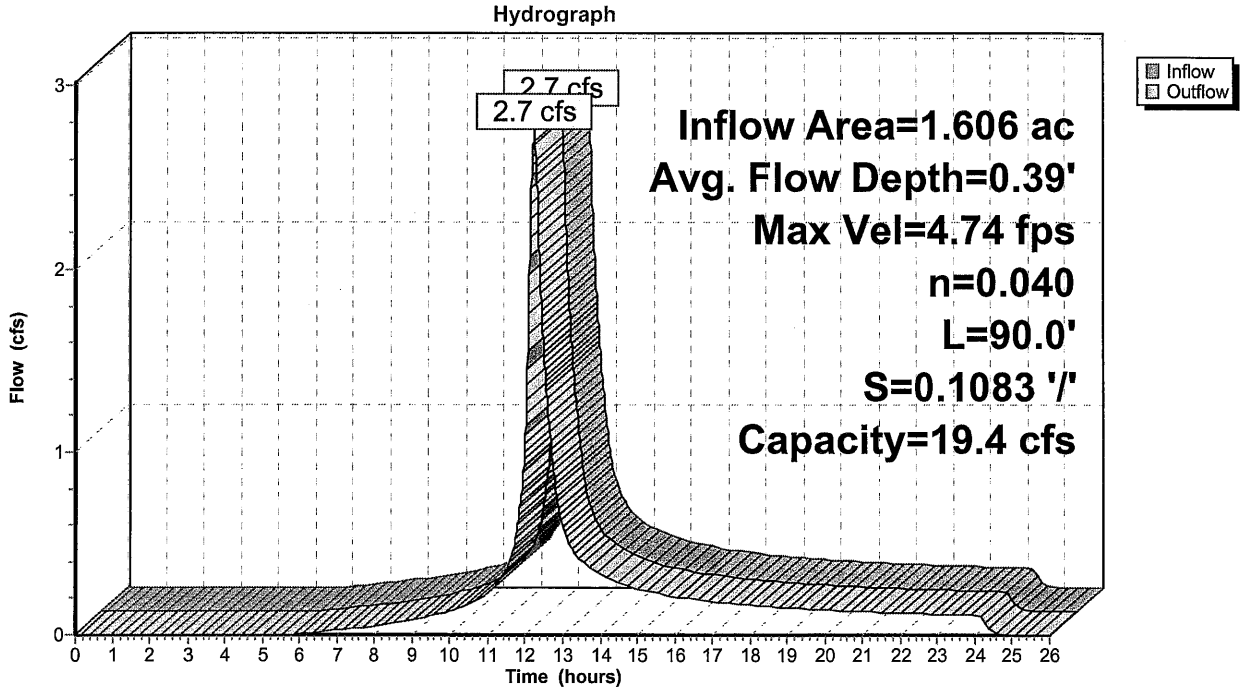
Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.74 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.98 fps, Avg. Travel Time= 0.8 min

Peak Storage= 51 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 1.00' Flow Area= 2.3 sf, Capacity= 19.4 cfs

3.50' x 1.00' deep Parabolic Channel, n= 0.040 Winding stream, pools & shoals
Length= 90.0' Slope= 0.1083 '/'
Inlet Invert= 31.50', Outlet Invert= 21.75'



Reach R1: R1



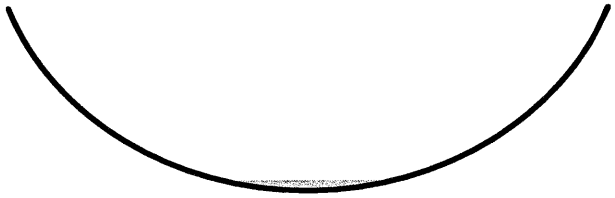
Summary for Reach R2: R2

Inflow Area = 0.014 ac, 0.00% Impervious, Inflow Depth = 2.17" for 10-yr event
Inflow = 0.0 cfs @ 12.00 hrs, Volume= 0.003 af
Outflow = 0.0 cfs @ 12.00 hrs, Volume= 0.003 af, Atten= 7%, Lag= 0.4 min

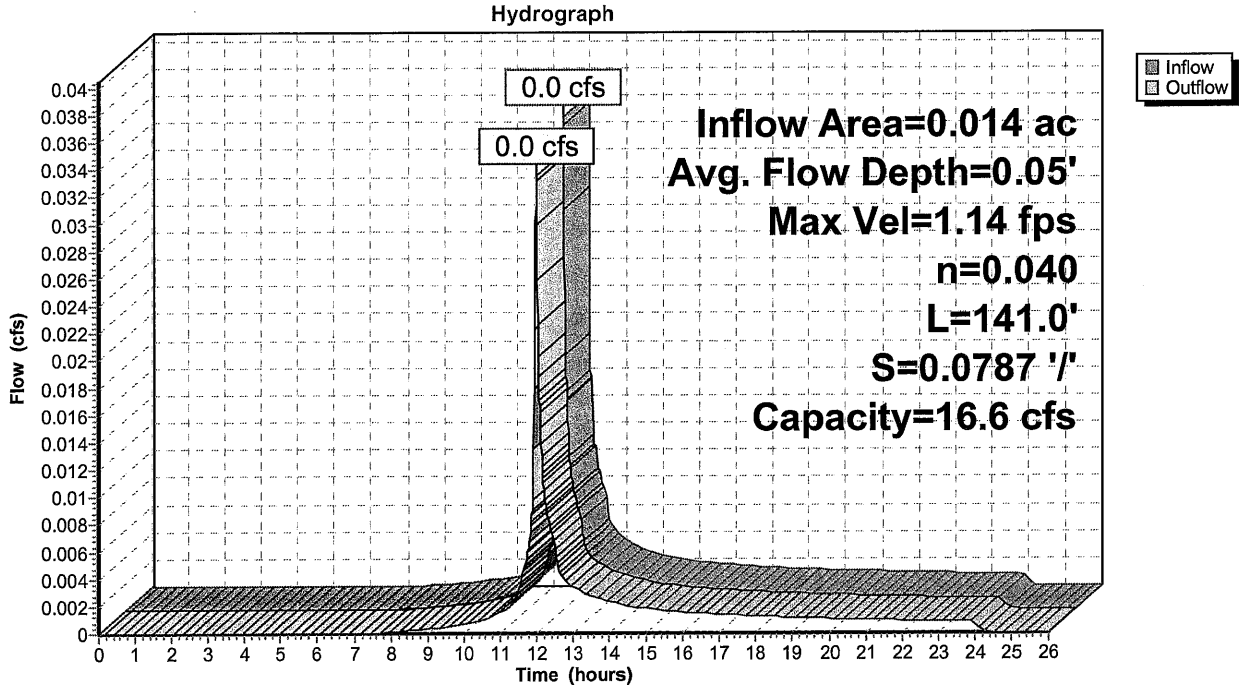
Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.14 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 0.45 fps, Avg. Travel Time= 5.2 min

Peak Storage= 4 cf @ 12.00 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 1.00' Flow Area= 2.3 sf, Capacity= 16.6 cfs

3.50' x 1.00' deep Parabolic Channel, n= 0.040 Winding stream, pools & shoals
Length= 141.0' Slope= 0.0787 '/'
Inlet Invert= 33.00', Outlet Invert= 21.90'



Reach R2: R2



Summary for Reach R3: R3

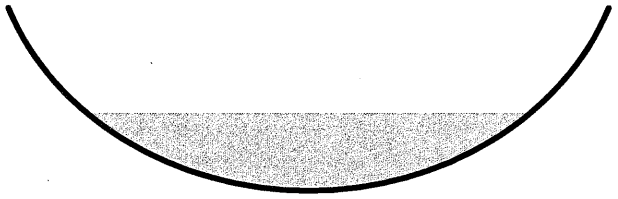
[62] Hint: Exceeded Reach R2 OUTLET depth by 0.39' @ 12.32 hrs
[62] Hint: Exceeded Reach R5 OUTLET depth by 0.17' @ 12.12 hrs

Inflow Area = 1.584 ac, 68.77% Impervious, Inflow Depth > 3.63" for 10-yr event
Inflow = 1.7 cfs @ 12.21 hrs, Volume= 0.479 af
Outflow = 1.7 cfs @ 12.21 hrs, Volume= 0.479 af, Atten= 0%, Lag= 0.0 min

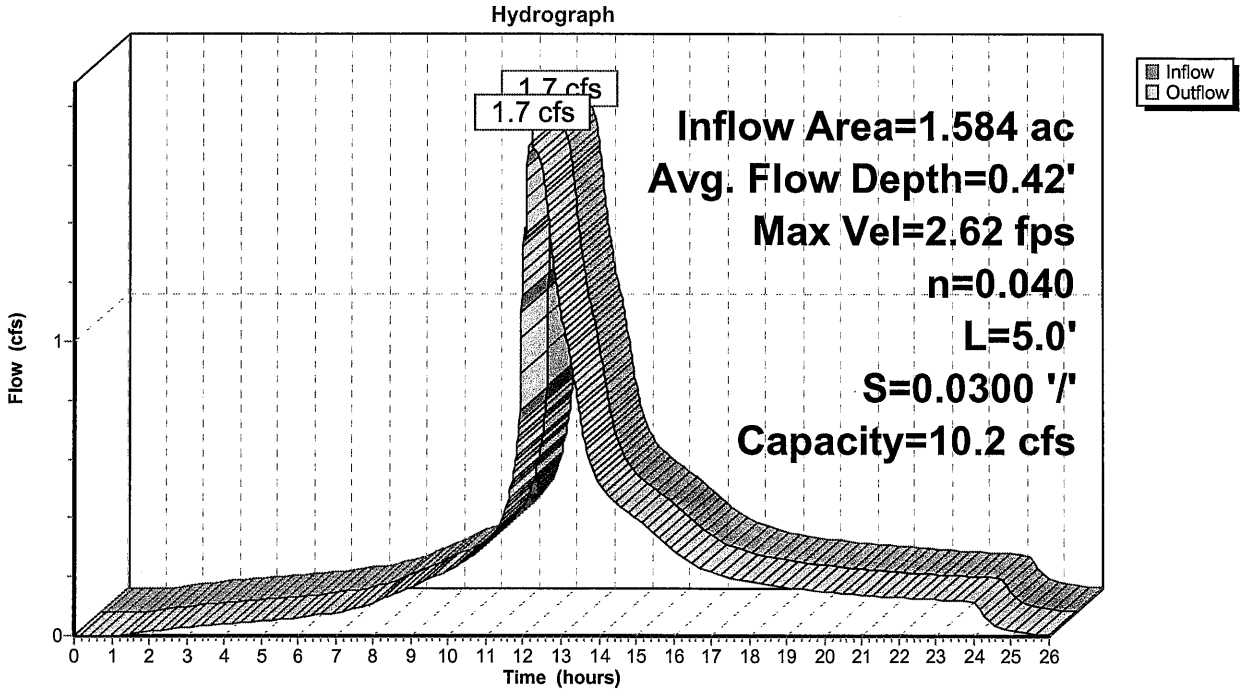
Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.62 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 0.1 min

Peak Storage= 3 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 1.00' Flow Area= 2.3 sf, Capacity= 10.2 cfs

3.50' x 1.00' deep Parabolic Channel, n= 0.040 Winding stream, pools & shoals
Length= 5.0' Slope= 0.0300 '/'
Inlet Invert= 21.90', Outlet Invert= 21.75'



Reach R3: R3



Summary for Reach R4: R4

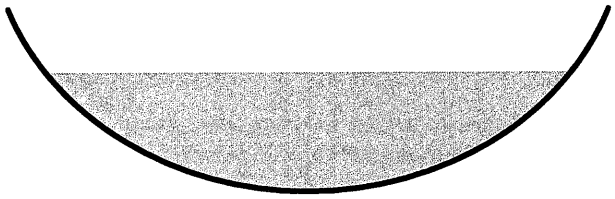
[62] Hint: Exceeded Reach R1 OUTLET depth by 0.27' @ 12.12 hrs
[63] Warning: Exceeded Reach R3 INLET depth by 0.08' @ 12.22 hrs

Inflow Area = 3.342 ac, 47.48% Impervious, Inflow Depth > 3.16" for 10-yr event
Inflow = 4.5 cfs @ 12.21 hrs, Volume= 0.879 af
Outflow = 4.5 cfs @ 12.21 hrs, Volume= 0.879 af, Atten= 0%, Lag= 0.2 min

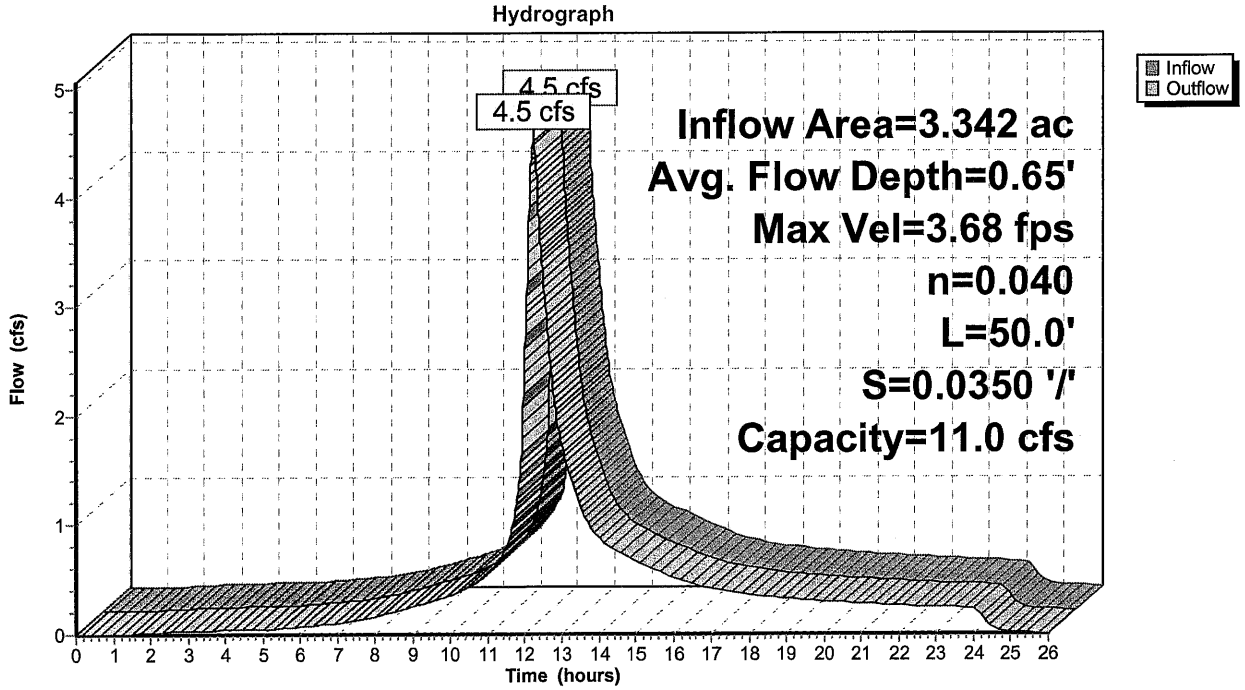
Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.68 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.55 fps, Avg. Travel Time= 0.5 min

Peak Storage= 61 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.65'
Bank-Full Depth= 1.00' Flow Area= 2.3 sf, Capacity= 11.0 cfs

3.50' x 1.00' deep Parabolic Channel, n= 0.040 Winding stream, pools & shoals
Length= 50.0' Slope= 0.0350 '/'
Inlet Invert= 21.75', Outlet Invert= 20.00'



Reach R4: R4



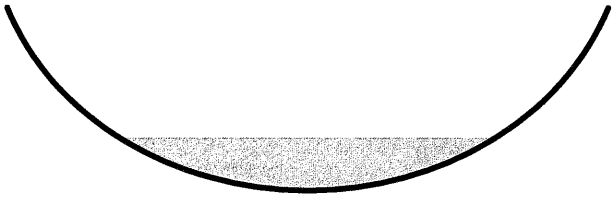
Summary for Reach R5: R5

Inflow Area = 1.251 ac, 79.57% Impervious, Inflow Depth > 3.87" for 10-yr event
Inflow = 1.4 cfs @ 12.49 hrs, Volume= 0.403 af
Outflow = 1.4 cfs @ 12.50 hrs, Volume= 0.403 af, Atten= 0%, Lag= 0.3 min

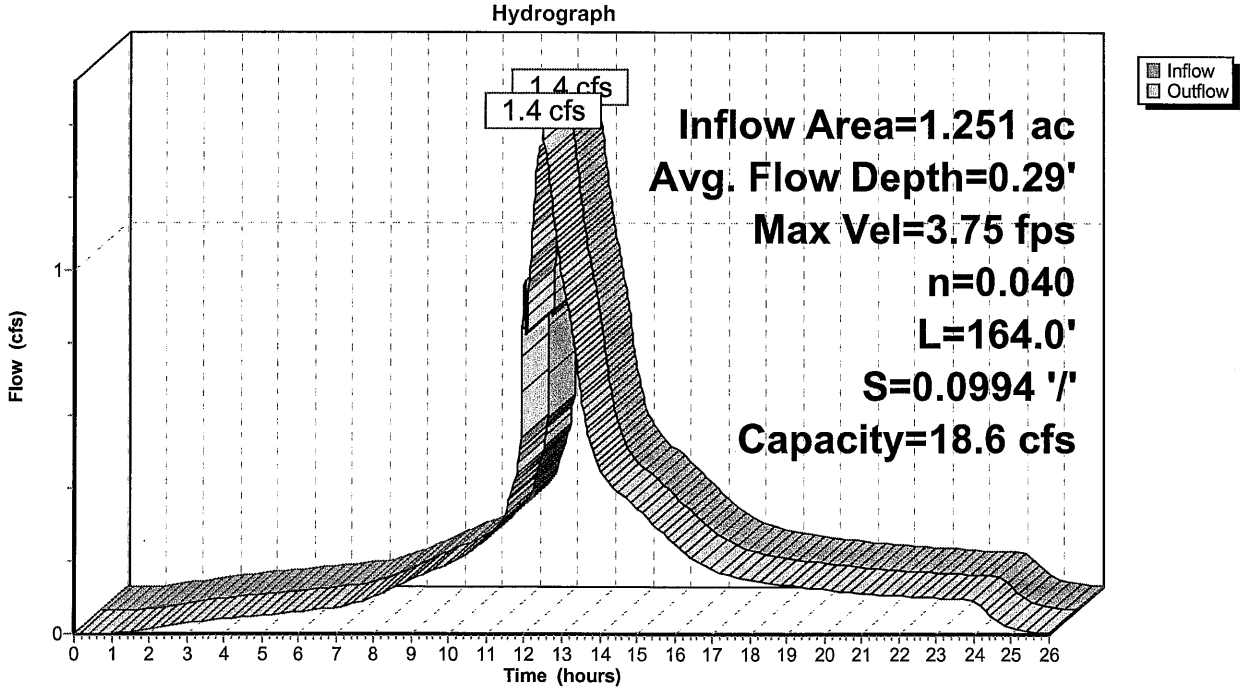
Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.75 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.84 fps, Avg. Travel Time= 1.5 min

Peak Storage= 59 cf @ 12.50 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00' Flow Area= 2.3 sf, Capacity= 18.6 cfs

3.50' x 1.00' deep Parabolic Channel, n= 0.040 Winding stream, pools & shoals
Length= 164.0' Slope= 0.0994 '/'
Inlet Invert= 38.20', Outlet Invert= 21.90'



Reach R5: R5



Summary for Pond DP1: DP1

Inflow Area = 1.114 ac, 79.09% Impervious, Inflow Depth > 3.85" for 10-yr event
Inflow = 3.4 cfs @ 11.99 hrs, Volume= 0.357 af
Outflow = 1.9 cfs @ 12.11 hrs, Volume= 0.357 af, Atten= 42%, Lag= 7.1 min
Primary = 1.9 cfs @ 12.11 hrs, Volume= 0.357 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 43.41' @ 12.11 hrs Surf.Area= 813 sf Storage= 1,904 cf
Flood Elev= 43.75' Surf.Area= 745 sf Storage= 2,174 cf

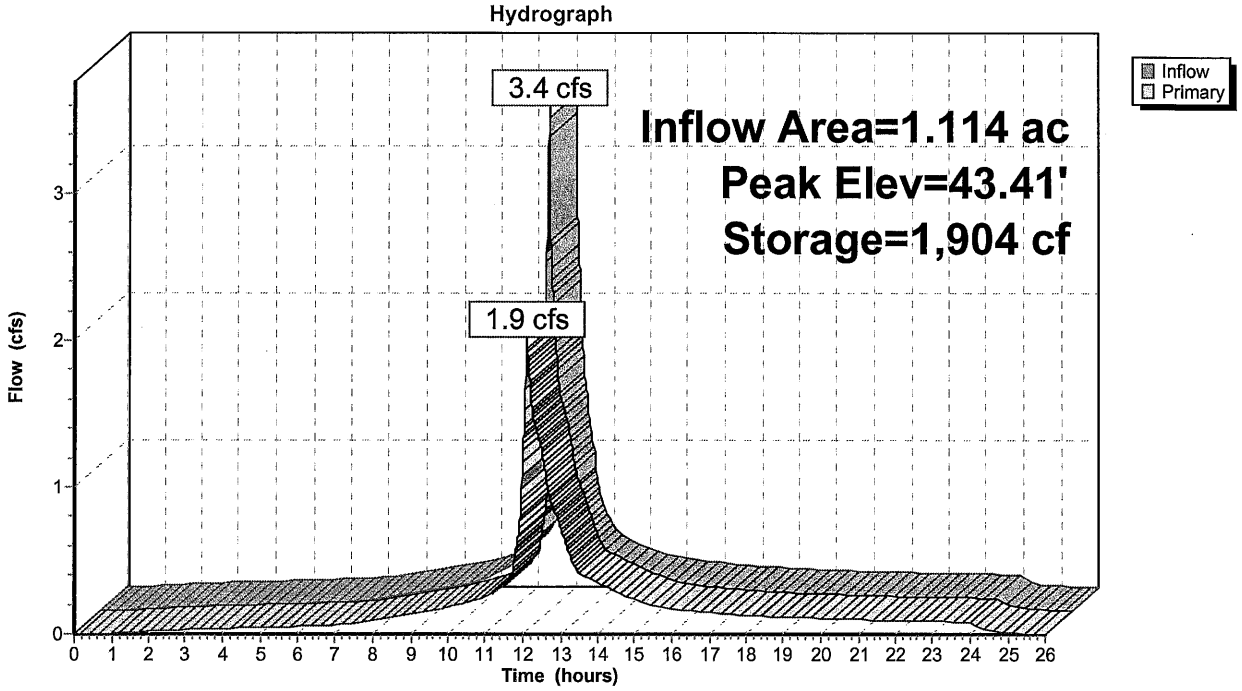
Plug-Flow detention time= 16.1 min calculated for 0.357 af (100% of inflow)
Center-of-Mass det. time= 15.9 min (811.9 - 796.0)

Volume	Invert	Avail.Storage	Storage Description
#1	40.75'	2,702 cf	**48.0" D x 215.0'L Pipe Storage**

Device	Routing	Invert	Outlet Devices
#1	Primary	40.65'	**18.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.65' / 40.65' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	40.75'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	41.80'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	42.65'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	43.30'	**4.0' long x 4.30' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s) 2.5' Crest Height

Primary OutFlow Max=1.9 cfs @ 12.11 hrs HW=43.40' TW=39.84' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.9 cfs of 12.0 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.7 cfs @ 7.60 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 0.5 cfs @ 5.77 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 0.3 cfs @ 3.69 fps)
  └─**5=Sharp-Crested Rectangular Weir** (Weir Controls 0.4 cfs @ 1.06 fps)

Pond DP1: DP1


Hydrograph
3.4 cfs
1.9 cfs
Inflow Area=1.114 ac
Peak Elev=43.41'
Storage=1,904 cf
Inflow
Primary
Flow (cfs)
0
1
2
3
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
Time (hours)

Summary for Pond DP2: DP2

Inflow Area = 1.114 ac, 79.09% Impervious, Inflow Depth > 3.85" for 10-yr event
Inflow = 1.9 cfs @ 12.11 hrs, Volume= 0.357 af
Outflow = 1.3 cfs @ 12.50 hrs, Volume= 0.357 af, Atten= 35%, Lag= 23.3 min
Primary = 1.3 cfs @ 12.50 hrs, Volume= 0.357 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 40.32' @ 12.50 hrs Surf.Area= 1,243 sf Storage= 1,730 cf
Flood Elev= 42.50' Surf.Area= 0 sf Storage= 3,921 cf

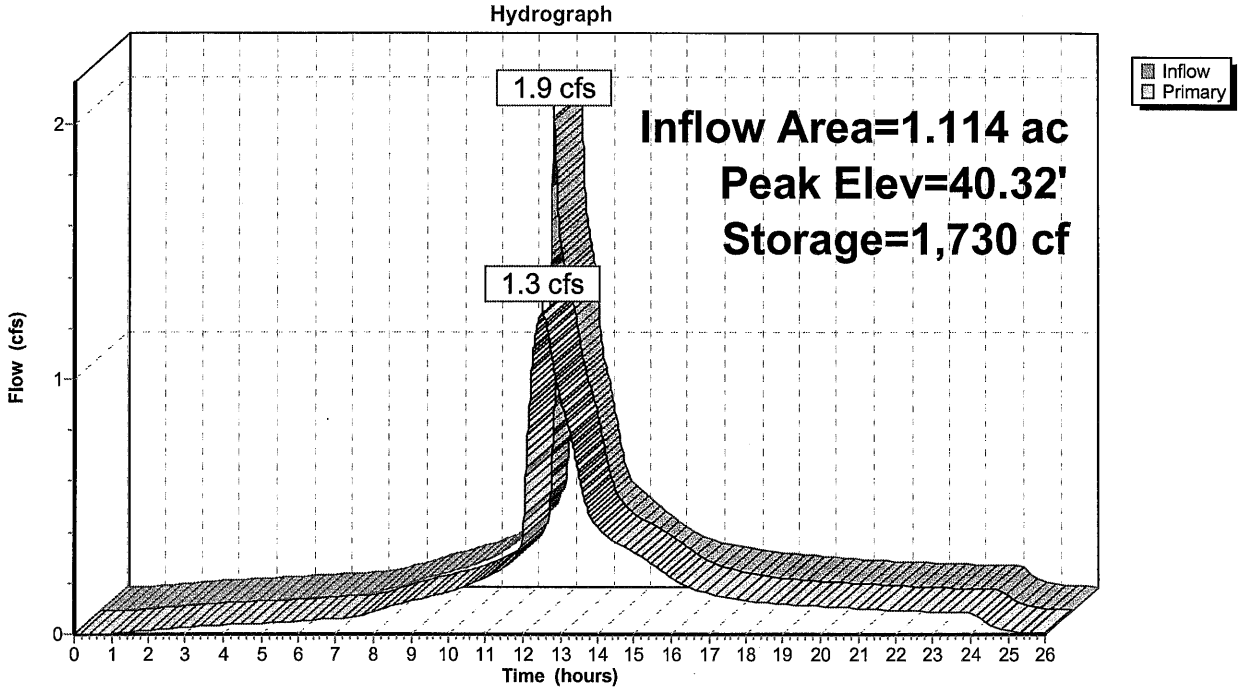
Plug-Flow detention time= 21.3 min calculated for 0.357 af (100% of inflow)
Center-of-Mass det. time= 20.9 min (832.9 - 811.9)

Volume	Invert	Avail.Storage	Storage Description
#1	38.50'	3,921 cf	**48.0" D x 312.0'L Pipe Storage**

Device	Routing	Invert	Outlet Devices
#1	Primary	38.40'	**15.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 38.40' / 38.35' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	38.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	39.40'	**5.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	40.00'	**5.0" Vert. Orifice/Grate** C= 0.600
#5	Device 1	40.90'	**5.0" Vert. Orifice/Grate** C= 0.600
#6	Device 1	41.75'	**4.0' long x 3.25' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s) 3.2' Crest Height

Primary OutFlow Max=1.3 cfs @ 12.50 hrs HW=40.32' TW=38.92' (Dynamic Tailwater)
↑**1=Culvert** (Passes 1.3 cfs of 6.6 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 0.5 cfs @ 5.69 fps)
—**3=Orifice/Grate** (Orifice Controls 0.6 cfs @ 4.05 fps)
—**4=Orifice/Grate** (Orifice Controls 0.2 cfs @ 1.91 fps)
—**5=Orifice/Grate** (Controls 0.0 cfs)
—**6=Sharp-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond DP2: DP2


Hydrograph
1.9 cfs
1.3 cfs
Inflow Area=1.114 ac
Peak Elev=40.32'
Storage=1,730 cf
Inflow
Primary
Flow (cfs)
0
1
2
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
Time (hours)

Summary for Pond Ex. Pipe A: Ex. Pipe A

Inflow Area = 3.681 ac, 43.46% Impervious, Inflow Depth > 3.06" for 10-yr event
Inflow = 4.8 cfs @ 12.21 hrs, Volume= 0.938 af
Outflow = 4.7 cfs @ 12.25 hrs, Volume= 0.938 af, Atten= 2%, Lag= 2.5 min
Primary = 4.7 cfs @ 12.25 hrs, Volume= 0.938 af
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 19.99' @ 12.25 hrs Surf.Area= 284 sf Storage= 242 cf
Flood Elev= 20.50' Surf.Area= 1,070 sf Storage= 564 cf

Plug-Flow detention time= 0.3 min calculated for 0.938 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (849.8 - 849.5)

Volume	Invert	Avail.Storage	Storage Description
#1	17.90'	564 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

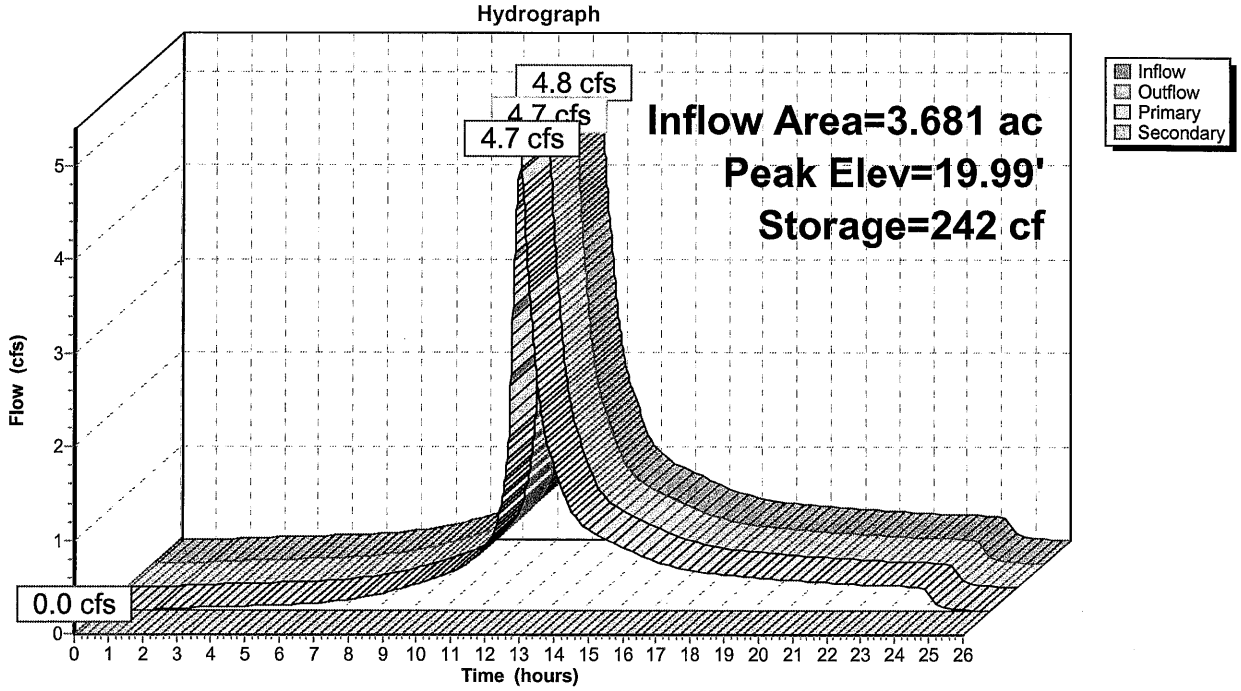
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
17.90	10	12.0	0	0	10
20.00	287	144.7	245	245	1,673
20.50	1,070	215.9	319	564	3,718

Device	Routing	Invert	Outlet Devices
#1	Primary	17.92'	**12.0" Round Culvert** L= 4.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 17.92' / 17.50' S= 0.1050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Secondary	20.10'	**10.0' long x 5.0' 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 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=4.7 cfs @ 12.25 hrs HW=19.99' (Free Discharge)
1=Culvert (Inlet Controls 4.7 cfs @ 6.03 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=17.90' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.0 cfs)

Pond Ex. Pipe A: Ex. Pipe A



Summary for Pond PCB1: PCB1

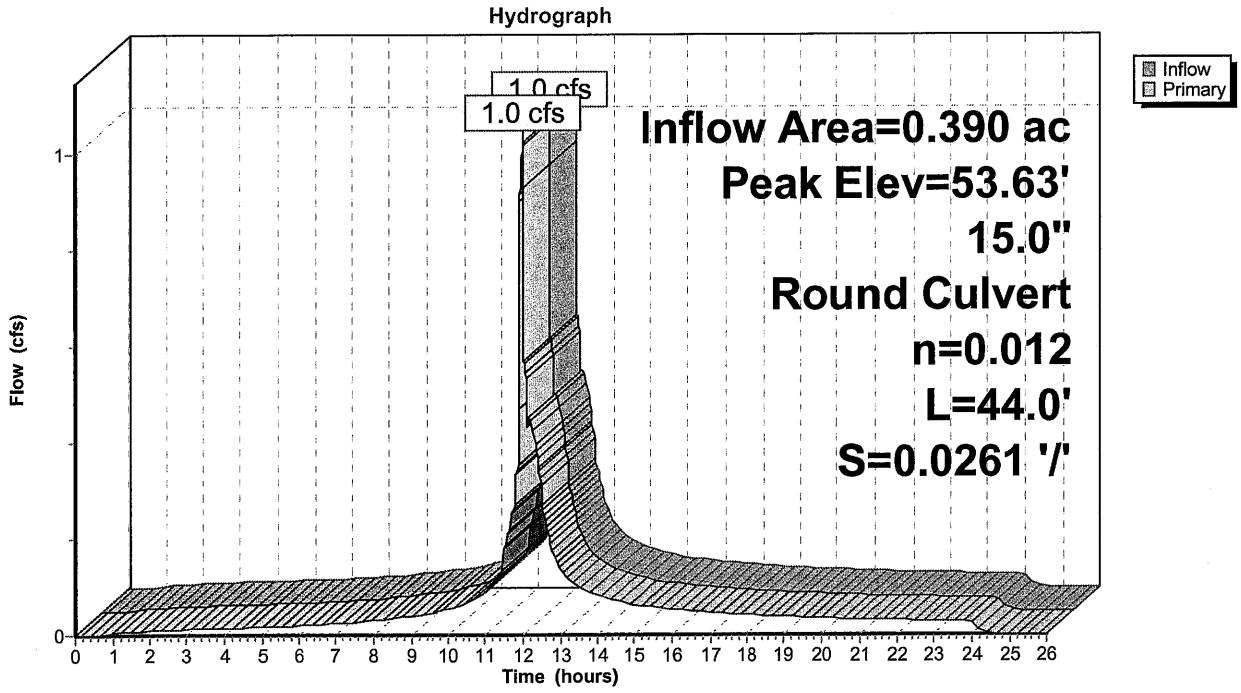
Inflow Area = 0.390 ac, 60.47% Impervious, Inflow Depth = 3.44" for 10-yr event
Inflow = 1.0 cfs @ 11.99 hrs, Volume= 0.112 af
Outflow = 1.0 cfs @ 11.99 hrs, Volume= 0.112 af, Atten= 0%, Lag= 0.0 min
Primary = 1.0 cfs @ 11.99 hrs, Volume= 0.112 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 53.63' @ 11.99 hrs
Flood Elev= 57.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	53.15'	**15.0" Round Culvert** L= 44.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 53.15' / 52.00' S= 0.0261 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.0 cfs @ 11.99 hrs HW=53.63' TW=52.75' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.0 cfs @ 2.35 fps)

Pond PCB1: PCB1



Summary for Pond PCB2: PCB2

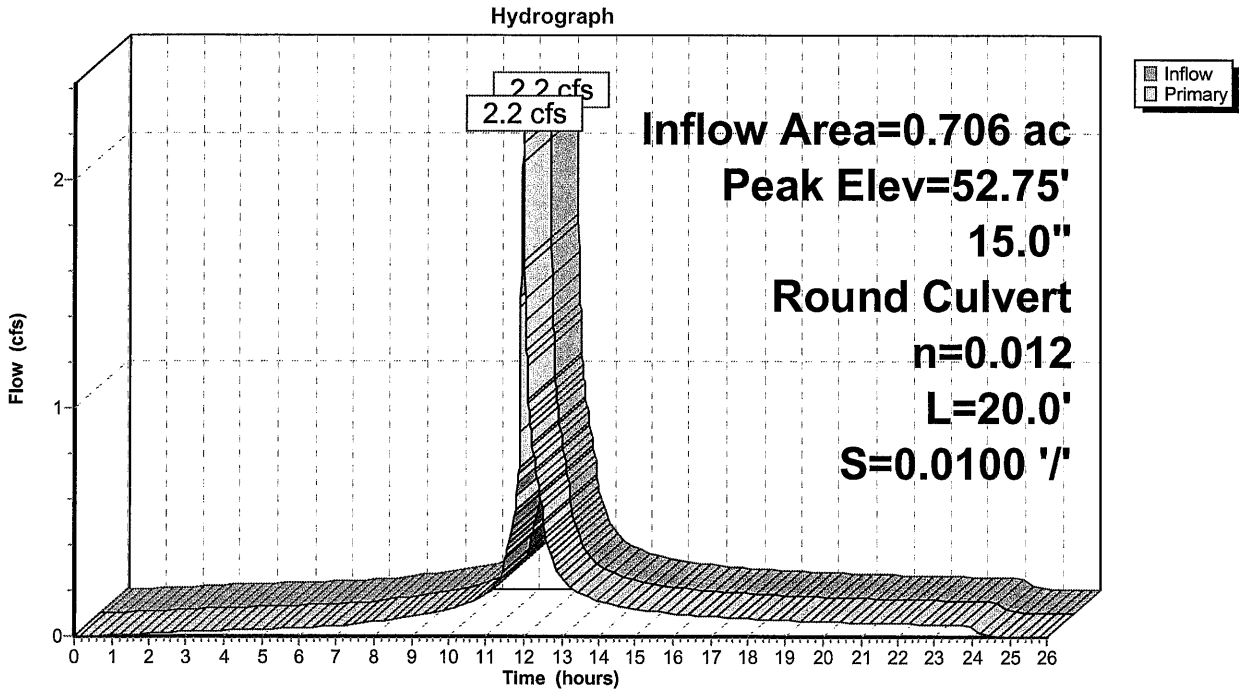
Inflow Area = 0.706 ac, 73.17% Impervious, Inflow Depth > 3.73" for 10-yr event
Inflow = 2.2 cfs @ 11.99 hrs, Volume= 0.219 af
Outflow = 2.2 cfs @ 11.99 hrs, Volume= 0.219 af, Atten= 0%, Lag= 0.0 min
Primary = 2.2 cfs @ 11.99 hrs, Volume= 0.219 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 52.75' @ 11.99 hrs
Flood Elev= 56.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.90'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.90' / 51.70' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.1 cfs @ 11.99 hrs HW=52.75' TW=52.42' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 2.1 cfs @ 3.36 fps)

Pond PCB2: PCB2



Summary for Pond PCB3: PCB3

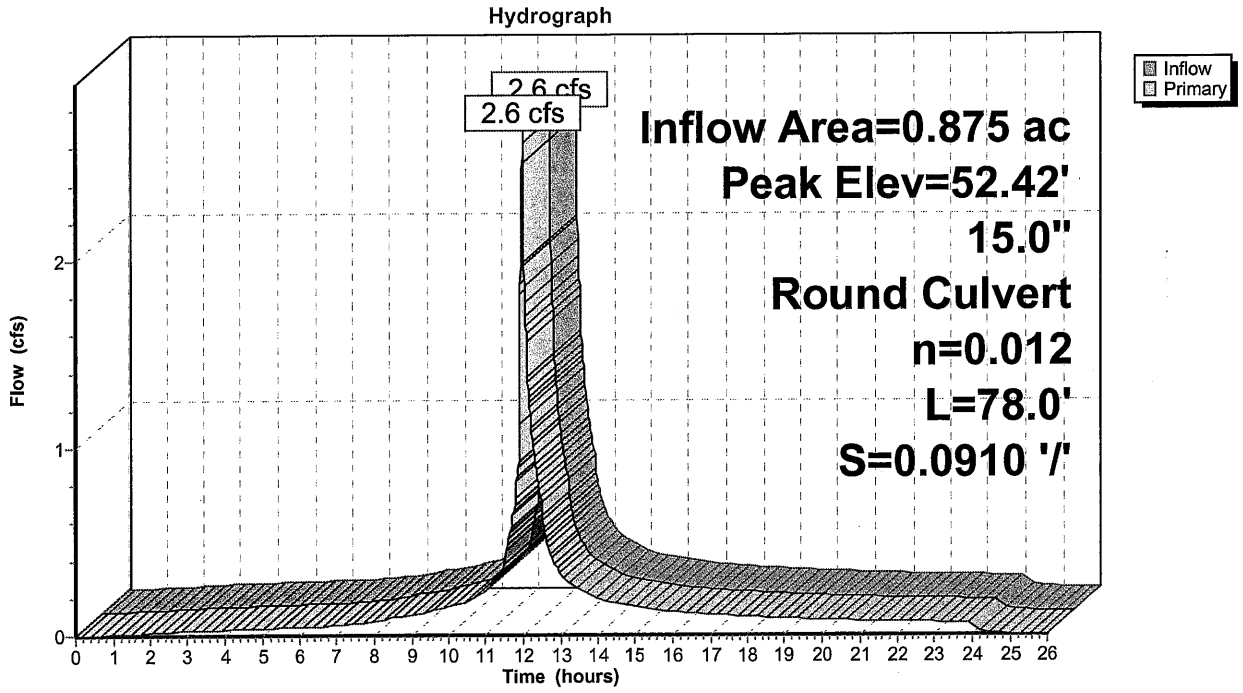
Inflow Area = 0.875 ac, 76.40% Impervious, Inflow Depth > 3.78" for 10-yr event
Inflow = 2.6 cfs @ 11.99 hrs, Volume= 0.276 af
Outflow = 2.6 cfs @ 11.99 hrs, Volume= 0.276 af, Atten= 0%, Lag= 0.0 min
Primary = 2.6 cfs @ 11.99 hrs, Volume= 0.276 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 52.42' @ 11.99 hrs
Flood Elev= 56.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.60'	**15.0" Round Culvert** L= 78.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.60' / 44.50' S= 0.0910 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.6 cfs @ 11.99 hrs HW=52.42' TW=43.64' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 2.6 cfs @ 3.08 fps)

Pond PCB3: PCB3



Summary for Pond PCB4: PCB4

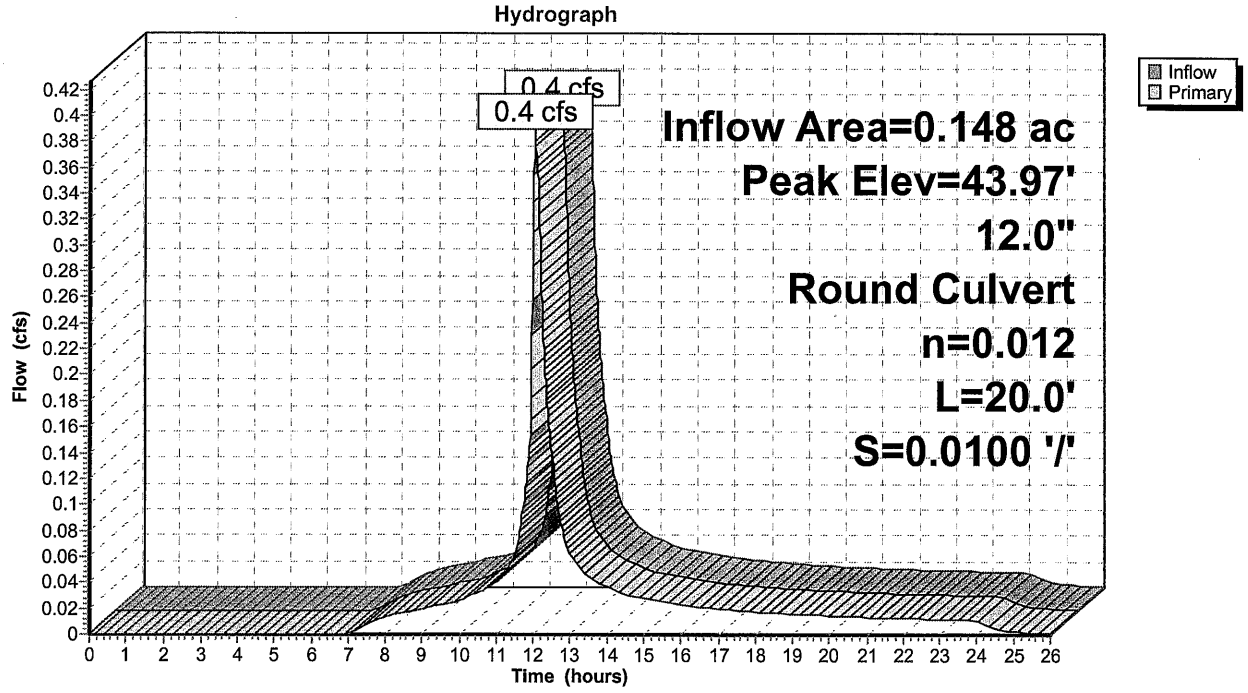
Inflow Area = 0.148 ac, 82.11% Impervious, Inflow Depth > 3.81" for 10-yr event
Inflow = 0.4 cfs @ 12.04 hrs, Volume= 0.047 af
Outflow = 0.4 cfs @ 12.04 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min
Primary = 0.4 cfs @ 12.04 hrs, Volume= 0.047 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 43.97' @ 12.04 hrs
Flood Elev= 46.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	43.65'	**12.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.65' / 43.45' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.4 cfs @ 12.04 hrs HW=43.97' TW=43.28' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.4 cfs @ 2.61 fps)

Pond PCB4: PCB4



Summary for Pond PCB5: PCB5

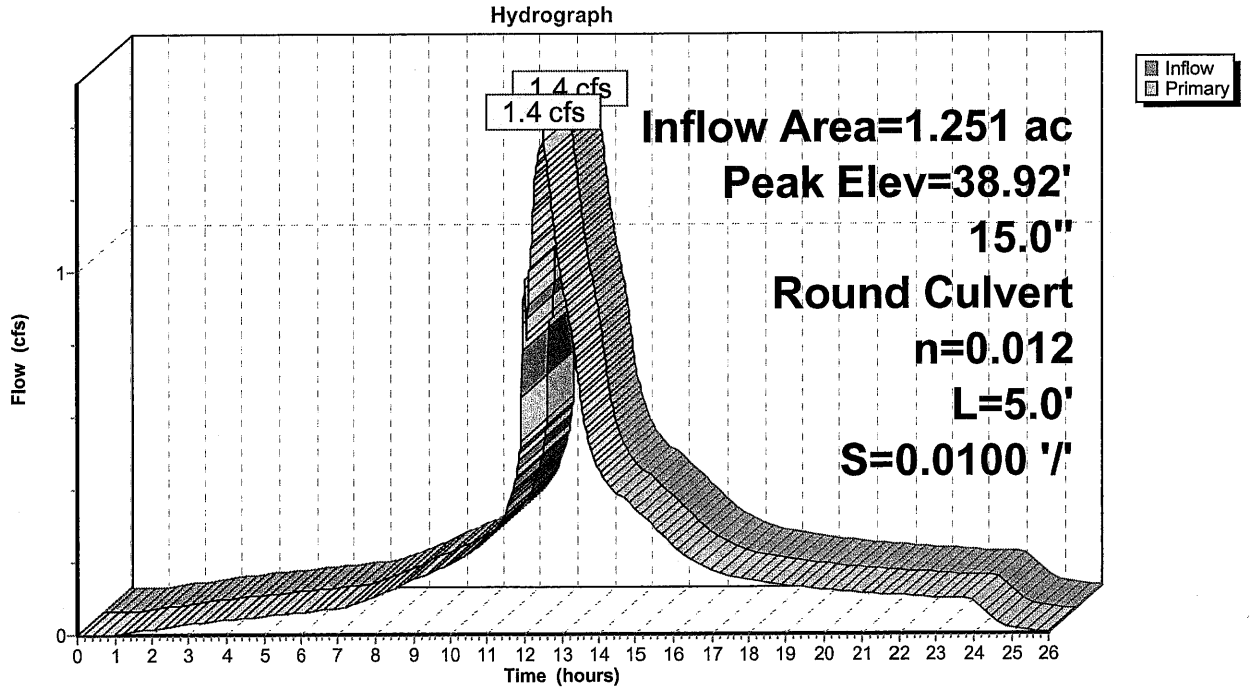
Inflow Area = 1.251 ac, 79.57% Impervious, Inflow Depth > 3.87" for 10-yr event
Inflow = 1.4 cfs @ 12.49 hrs, Volume= 0.403 af
Outflow = 1.4 cfs @ 12.49 hrs, Volume= 0.403 af, Atten= 0%, Lag= 0.0 min
Primary = 1.4 cfs @ 12.49 hrs, Volume= 0.403 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 38.92' @ 12.49 hrs
Flood Elev= 44.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	38.25'	**15.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 38.25' / 38.20' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.4 cfs @ 12.49 hrs HW=38.92' TW=38.49' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.4 cfs @ 2.94 fps)

Pond PCB5: PCB5



Summary for Pond PDMH1: PDMH1

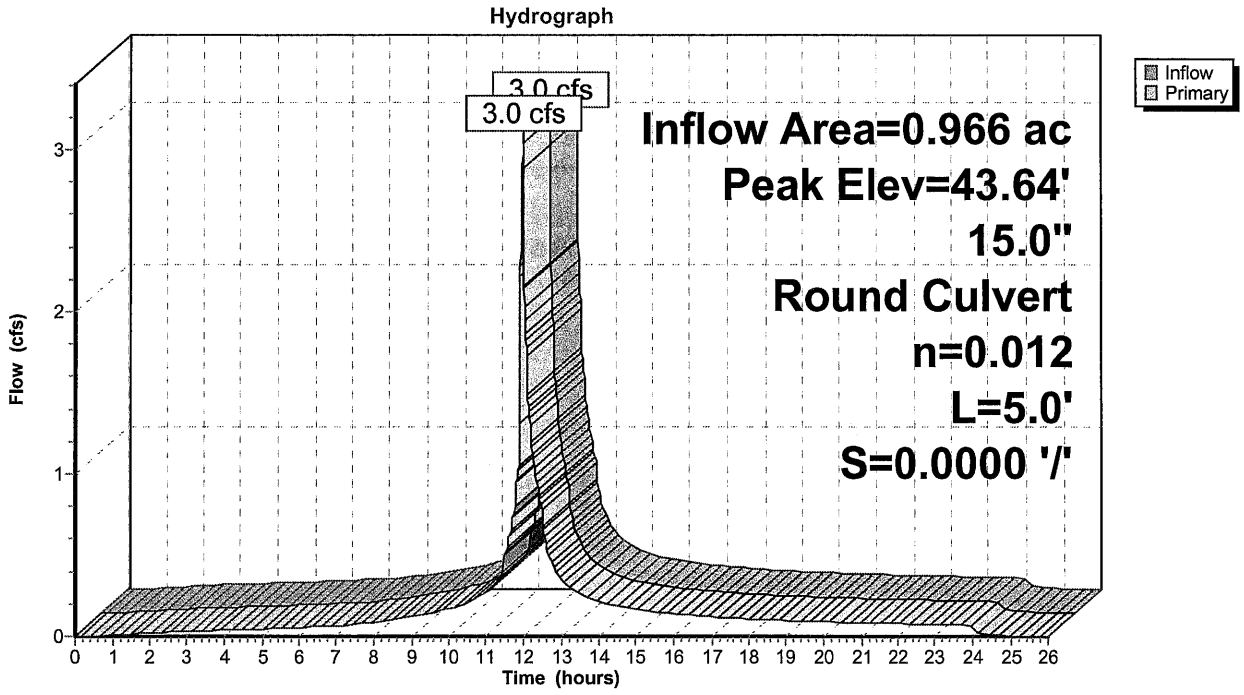
Inflow Area = 0.966 ac, 78.63% Impervious, Inflow Depth > 3.85" for 10-yr event
Inflow = 3.0 cfs @ 11.99 hrs, Volume= 0.310 af
Outflow = 3.0 cfs @ 11.99 hrs, Volume= 0.310 af, Atten= 0%, Lag= 0.0 min
Primary = 3.0 cfs @ 11.99 hrs, Volume= 0.310 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 43.64' @ 11.99 hrs
Flood Elev= 48.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	42.50'	**15.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.50' / 42.50' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.0 cfs @ 11.99 hrs HW=43.63' TW=42.94' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.0 cfs @ 3.40 fps)

Pond PDMH1: PDMH1



Summary for Pond PP1: Porous Pave 1

Inflow Area = 0.107 ac, 84.16% Impervious, Inflow Depth = 4.06" for 10-yr event
Inflow = 0.4 cfs @ 12.01 hrs, Volume= 0.036 af
Outflow = 0.3 cfs @ 12.06 hrs, Volume= 0.033 af, Atten= 36%, Lag= 3.1 min
Primary = 0.3 cfs @ 12.06 hrs, Volume= 0.033 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 59.95' @ 12.06 hrs Surf.Area= 0 sf Storage= 297 cf
Flood Elev= 60.53' Surf.Area= 0 sf Storage= 532 cf

Plug-Flow detention time= 106.3 min calculated for 0.033 af (92% of inflow)
Center-of-Mass det. time= 60.6 min (843.3 - 782.7)

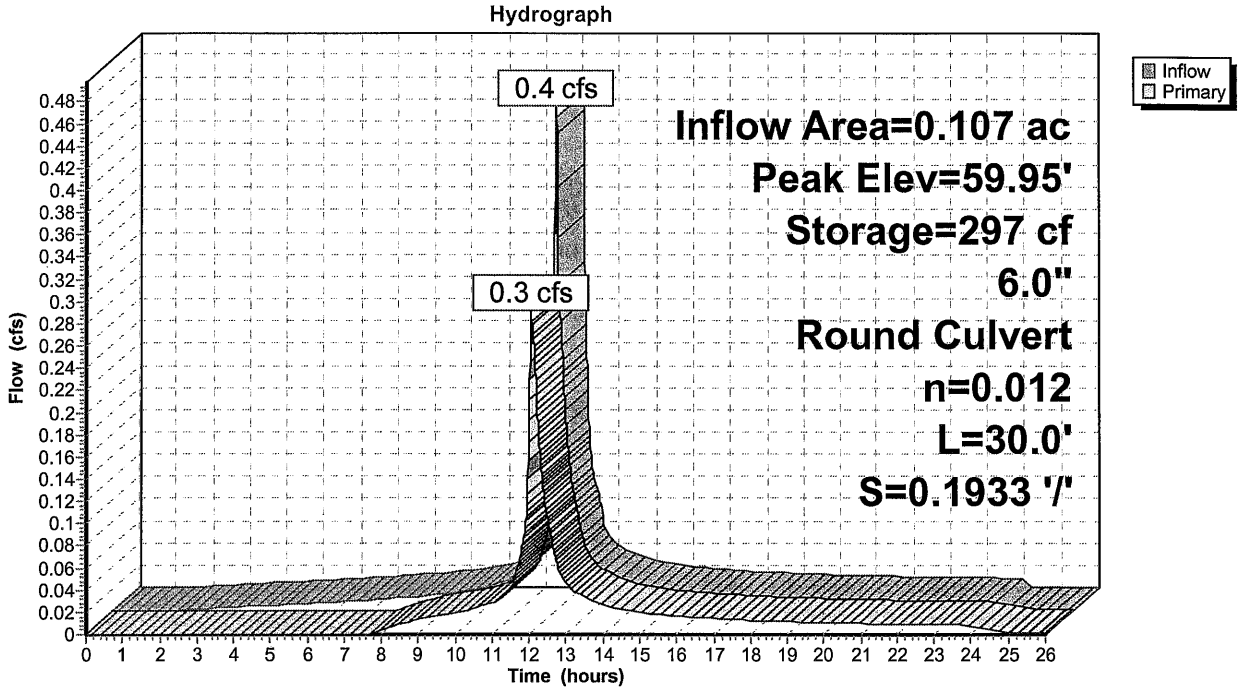
Volume	Invert	Avail.Storage	Storage Description
#1	59.30'	1,010 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) -Impervious

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
59.30	1,244	174.2	0.0	0	0	1,244
60.30	1,244	174.2	37.0	460	460	1,418
60.53	1,244	174.2	25.0	72	532	1,458
61.53	1,244	174.2	20.0	249	781	1,632
61.87	1,244	174.2	25.0	106	886	1,692
62.20	1,244	174.2	30.0	123	1,010	1,749

Device	Routing	Invert	Outlet Devices
#1	Primary	59.55'	**6.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 59.55' / 53.75' S= 0.1933 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.3 cfs @ 12.06 hrs HW=59.95' TW=52.23' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.3 cfs @ 1.69 fps)

Pond PP1: Porous Pave 1



Summary for Pond PP2: Porous Pave 2

Inflow Area = 0.092 ac, 91.63% Impervious, Inflow Depth = 4.28" for 10-yr event
Inflow = 0.4 cfs @ 12.00 hrs, Volume= 0.033 af
Outflow = 0.3 cfs @ 12.04 hrs, Volume= 0.030 af, Atten= 38%, Lag= 2.5 min
Primary = 0.3 cfs @ 12.04 hrs, Volume= 0.030 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 53.42' @ 12.04 hrs Surf.Area= 1,296 sf Storage= 295 cf
Flood Elev= 54.03' Surf.Area= 1,296 sf Storage= 554 cf

Plug-Flow detention time= 122.9 min calculated for 0.030 af (91% of inflow)
Center-of-Mass det. time= 70.3 min (836.5 - 766.2)

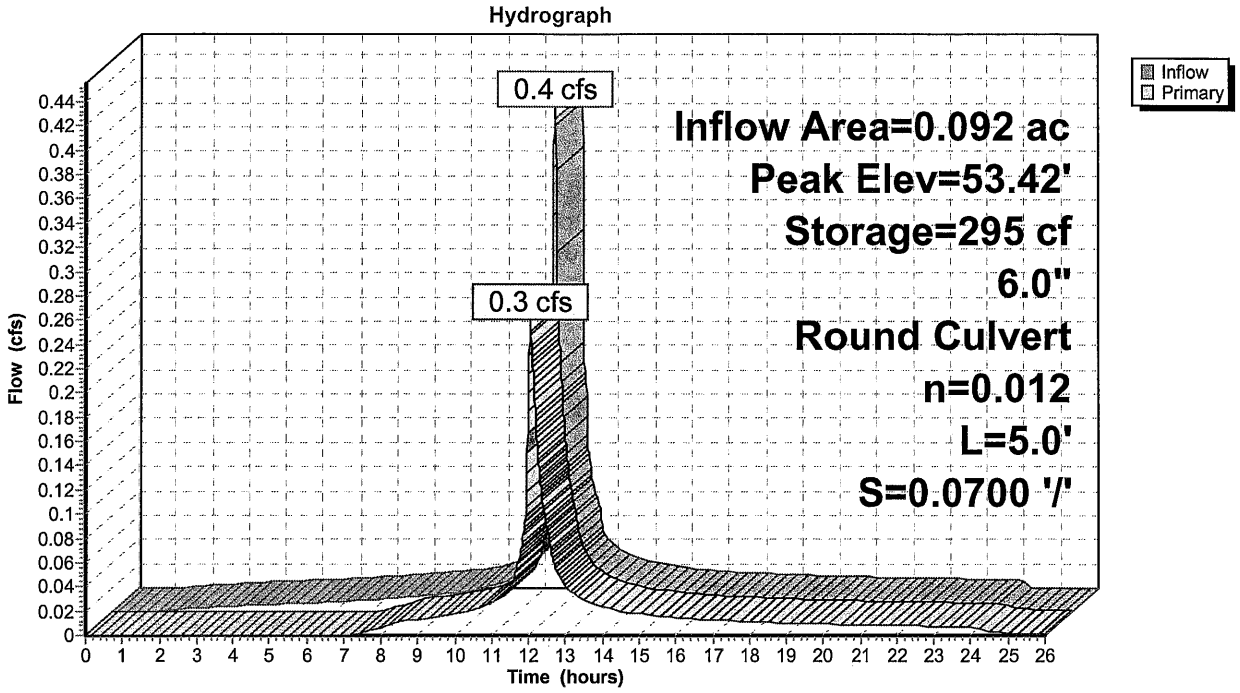
Volume	Invert	Avail.Storage	Storage Description
#1	52.80'	1,052 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.80	1,296	180.0	0.0	0	0	1,296
53.80	1,296	180.0	37.0	480	480	1,476
54.03	1,296	180.0	25.0	75	554	1,517
55.03	1,296	180.0	20.0	259	813	1,697
55.37	1,296	180.0	25.0	110	923	1,759
55.70	1,296	180.0	30.0	128	1,052	1,818

Device	Routing	Invert	Outlet Devices
#1	Primary	53.05'	**6.0" Round Culvert** L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 53.05' / 52.70' S= 0.0700 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.3 cfs @ 12.04 hrs HW=53.42' TW=52.59' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.3 cfs @ 1.63 fps)

Pond PP2: Porous Pave 2



Summary for Pond PP3: Porous Pave 3

Inflow Area = 0.148 ac, 82.11% Impervious, Inflow Depth = 4.06" for 10-yr event
Inflow = 0.6 cfs @ 12.00 hrs, Volume= 0.050 af
Outflow = 0.4 cfs @ 12.04 hrs, Volume= 0.047 af, Atten= 40%, Lag= 2.6 min
Primary = 0.4 cfs @ 12.04 hrs, Volume= 0.047 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 44.36' @ 12.04 hrs Surf.Area= 1,333 sf Storage= 375 cf
Flood Elev= 44.88' Surf.Area= 1,333 sf Storage= 587 cf

Plug-Flow detention time= 89.1 min calculated for 0.047 af (94% of inflow)
Center-of-Mass det. time= 52.5 min (834.1 - 781.6)

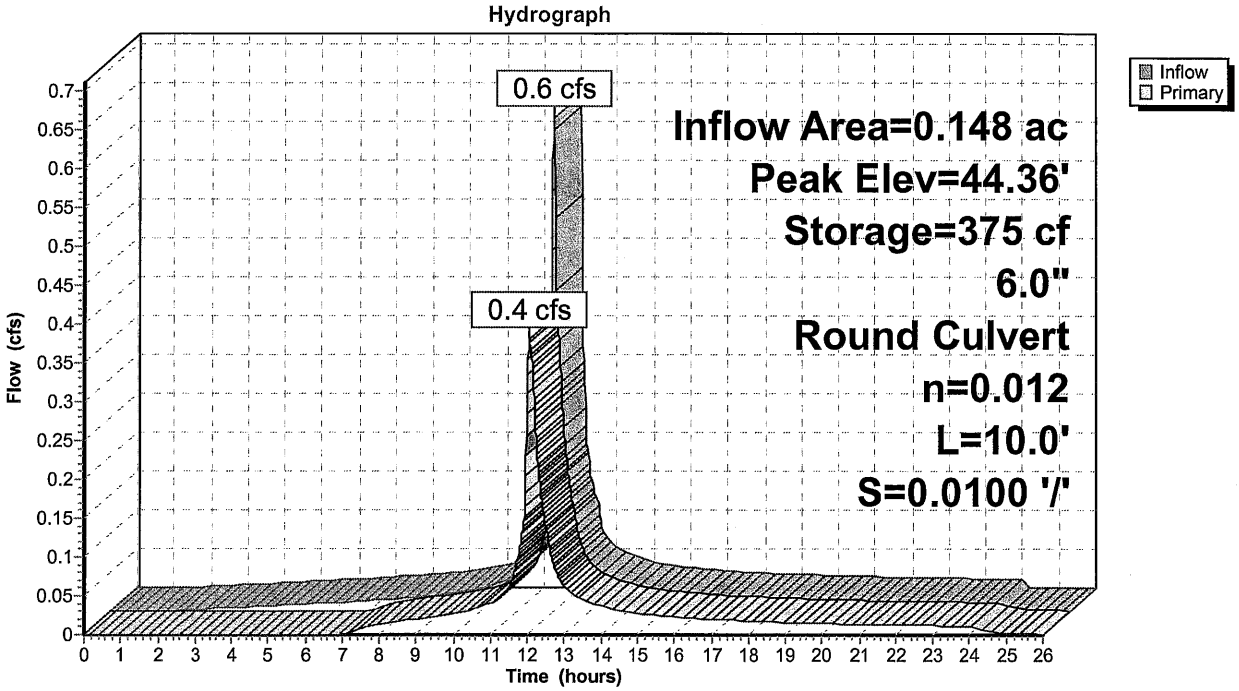
Volume	Invert	Avail.Storage	Storage Description
#1	43.60'	1,098 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
43.60	1,333	184.1	0.0	0	0	1,333
44.60	1,333	184.1	37.0	493	493	1,517
44.88	1,333	184.1	25.0	93	587	1,569
45.88	1,333	184.1	20.0	267	853	1,753
46.22	1,333	184.1	25.0	113	966	1,815
46.55	1,333	184.1	30.0	132	1,098	1,876

Device	Routing	Invert	Outlet Devices
#1	Primary	43.85'	**6.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 43.85' / 43.75' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.4 cfs @ 12.04 hrs HW=44.36' TW=43.97' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.4 cfs @ 1.93 fps)

Pond PP3: Porous Pave 3



Summary for Pond RD1: RD1

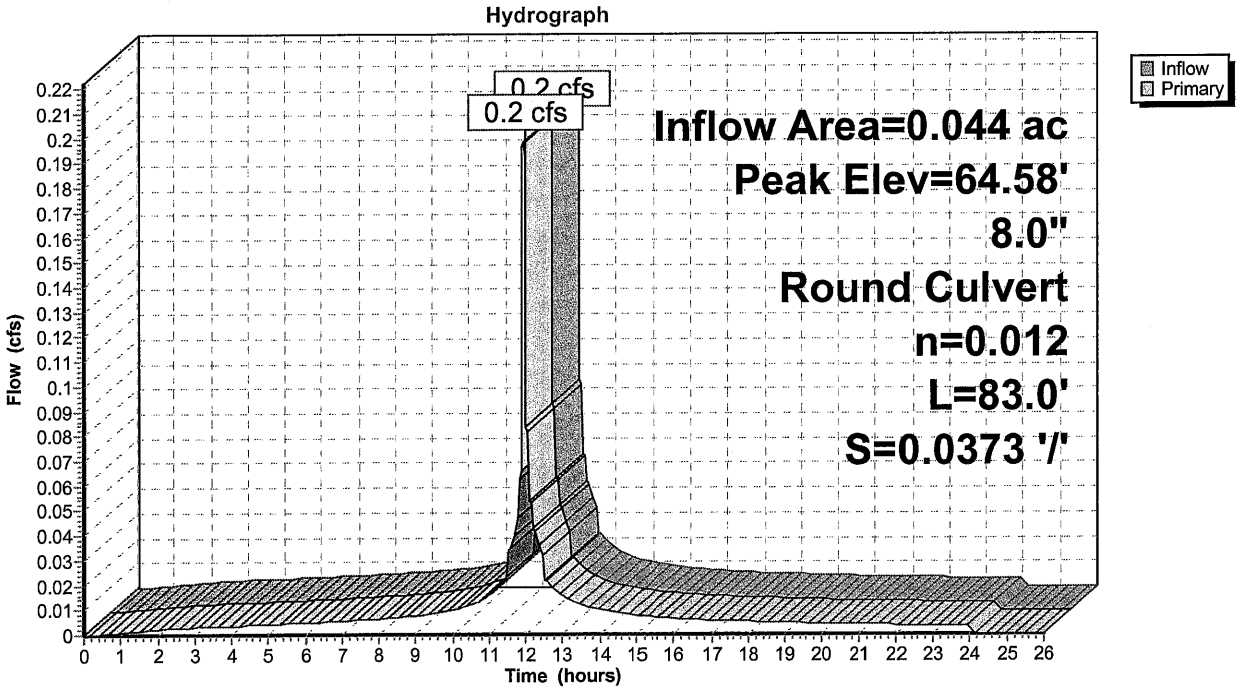
Inflow Area = 0.044 ac,100.00% Impervious, Inflow Depth = 4.51" for 10-yr event
Inflow = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af
Outflow = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
Primary = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 64.58' @ 11.99 hrs
Flood Elev= 65.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	64.30'	**8.0" Round Culvert** L= 83.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 64.30' / 61.20' S= 0.0373 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.2 cfs @ 11.99 hrs HW=64.58' TW=63.90' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.2 cfs @ 1.42 fps)

Pond RD1: RD1



Summary for Pond RD2: RD2

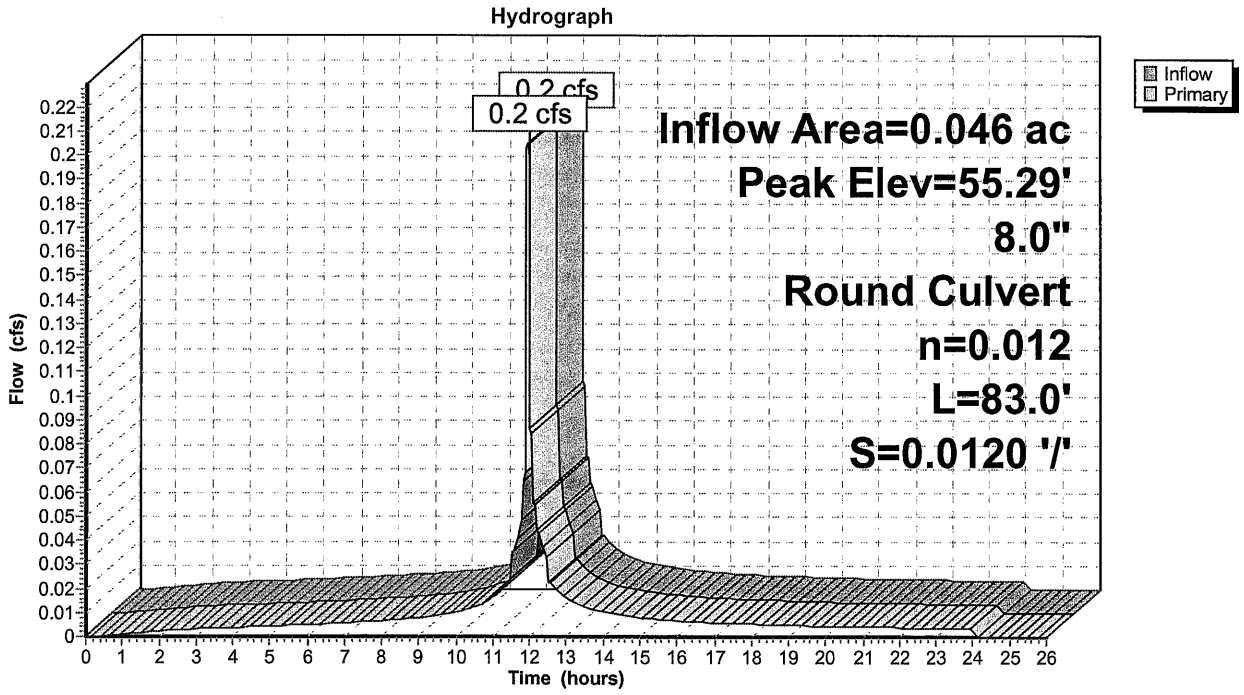
Inflow Area = 0.046 ac,100.00% Impervious, Inflow Depth = 4.51" for 10-yr event
Inflow = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af
Outflow = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
Primary = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 55.29' @ 11.99 hrs
Flood Elev= 56.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	55.00'	**8.0" Round Culvert** L= 83.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 55.00' / 54.00' S= 0.0120 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.2 cfs @ 11.99 hrs HW=55.29' TW=53.63' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.2 cfs @ 1.44 fps)

Pond RD2: RD2



Summary for Pond RD3: RD3

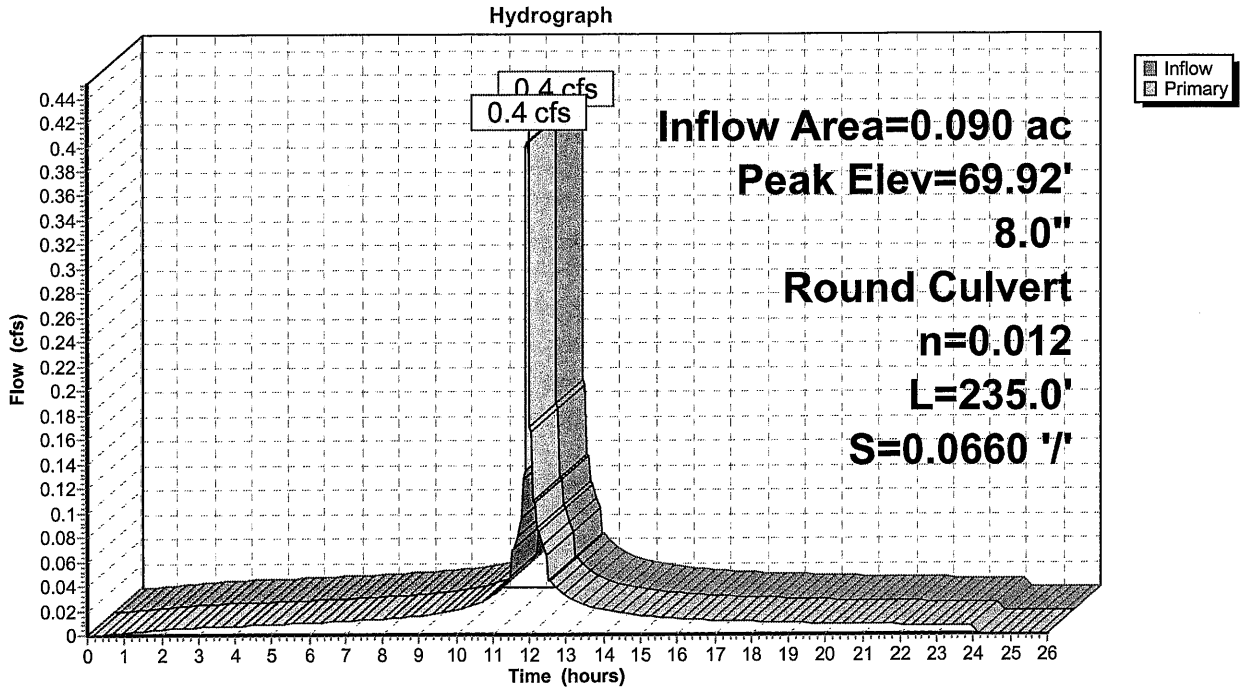
Inflow Area = 0.090 ac,100.00% Impervious, Inflow Depth = 4.51" for 10-yr event
Inflow = 0.4 cfs @ 11.99 hrs, Volume= 0.034 af
Outflow = 0.4 cfs @ 11.99 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min
Primary = 0.4 cfs @ 11.99 hrs, Volume= 0.034 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 69.92' @ 11.99 hrs
Flood Elev= 71.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	69.50'	**8.0" Round Culvert** L= 235.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 69.50' / 54.00' S= 0.0660 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.4 cfs @ 11.99 hrs HW=69.92' TW=53.63' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.4 cfs @ 1.74 fps)

Pond RD3: RD3



Summary for Pond RD4: RD4

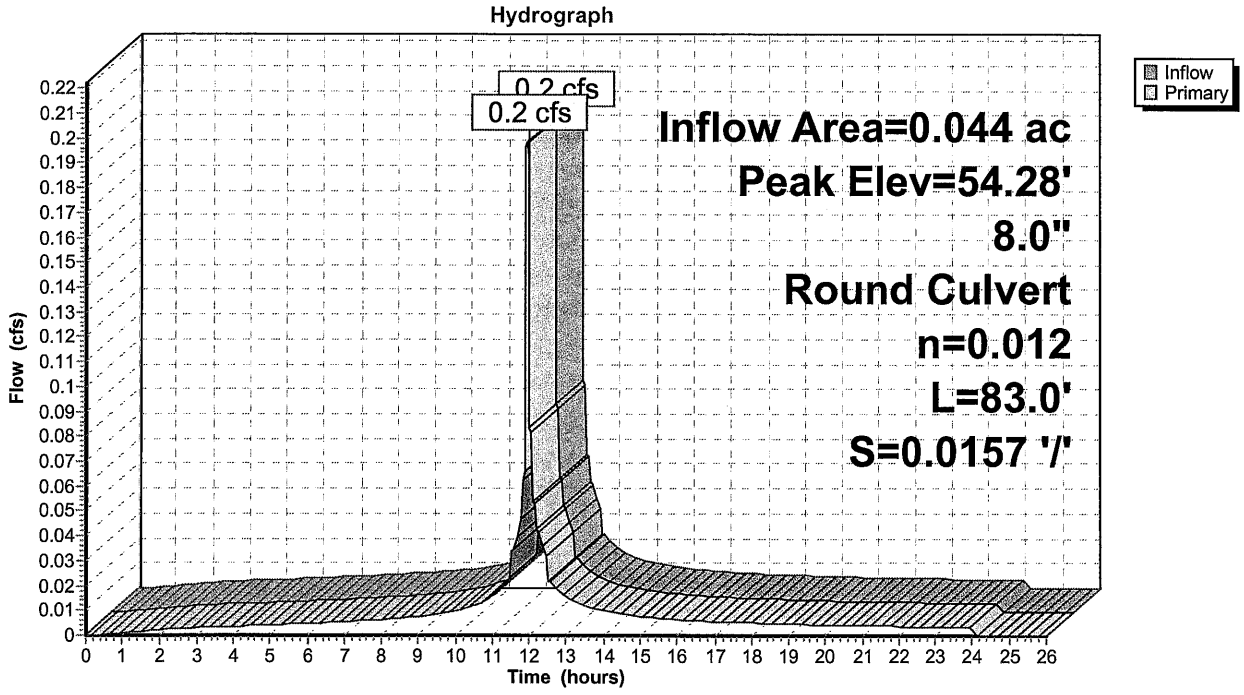
Inflow Area = 0.044 ac,100.00% Impervious, Inflow Depth = 4.51" for 10-yr event
Inflow = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af
Outflow = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
Primary = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 54.28' @ 11.99 hrs
Flood Elev= 56.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	54.00'	**8.0" Round Culvert** L= 83.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 54.00' / 52.70' S= 0.0157 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.2 cfs @ 11.99 hrs HW=54.28' TW=52.75' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.2 cfs @ 1.42 fps)

Pond RD4: RD4



Summary for Pond RD5: RD5

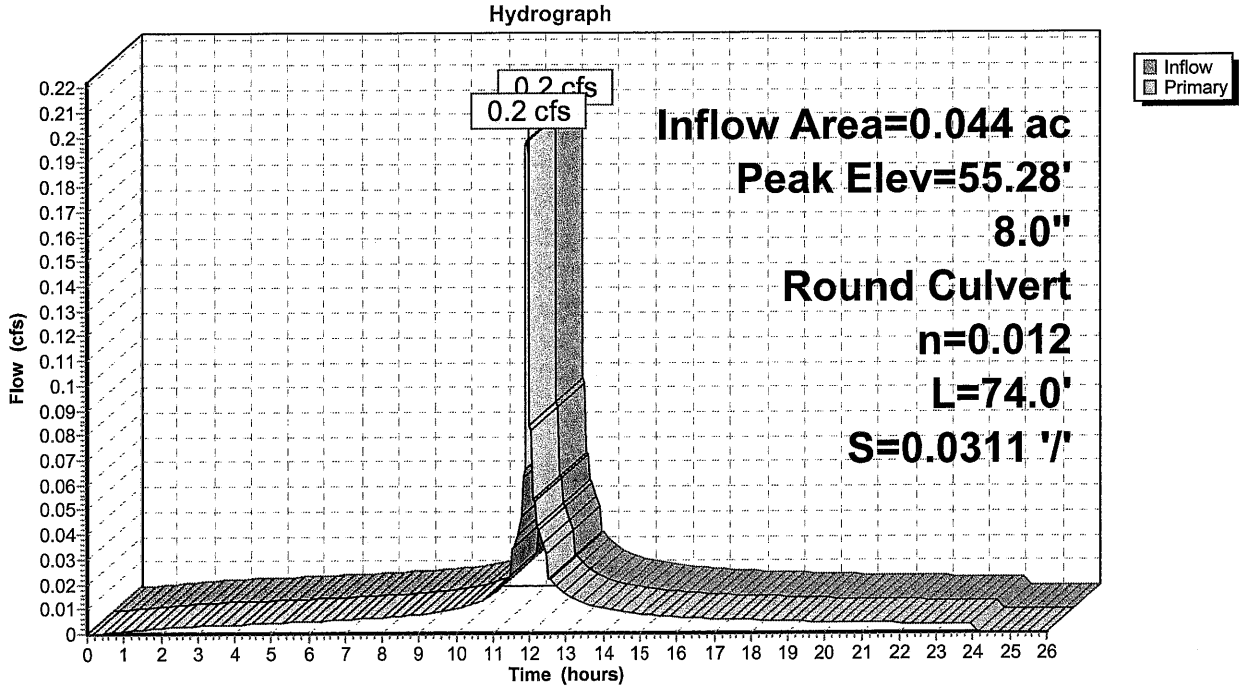
Inflow Area = 0.044 ac,100.00% Impervious, Inflow Depth = 4.51" for 10-yr event
Inflow = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af
Outflow = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
Primary = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 55.28' @ 11.99 hrs
Flood Elev= 56.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	55.00'	**8.0" Round Culvert** L= 74.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 55.00' / 52.70' S= 0.0311 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.2 cfs @ 11.99 hrs HW=55.28' TW=52.42' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.2 cfs @ 1.42 fps)

Pond RD5: RD5



Summary for Pond RD6: RD6

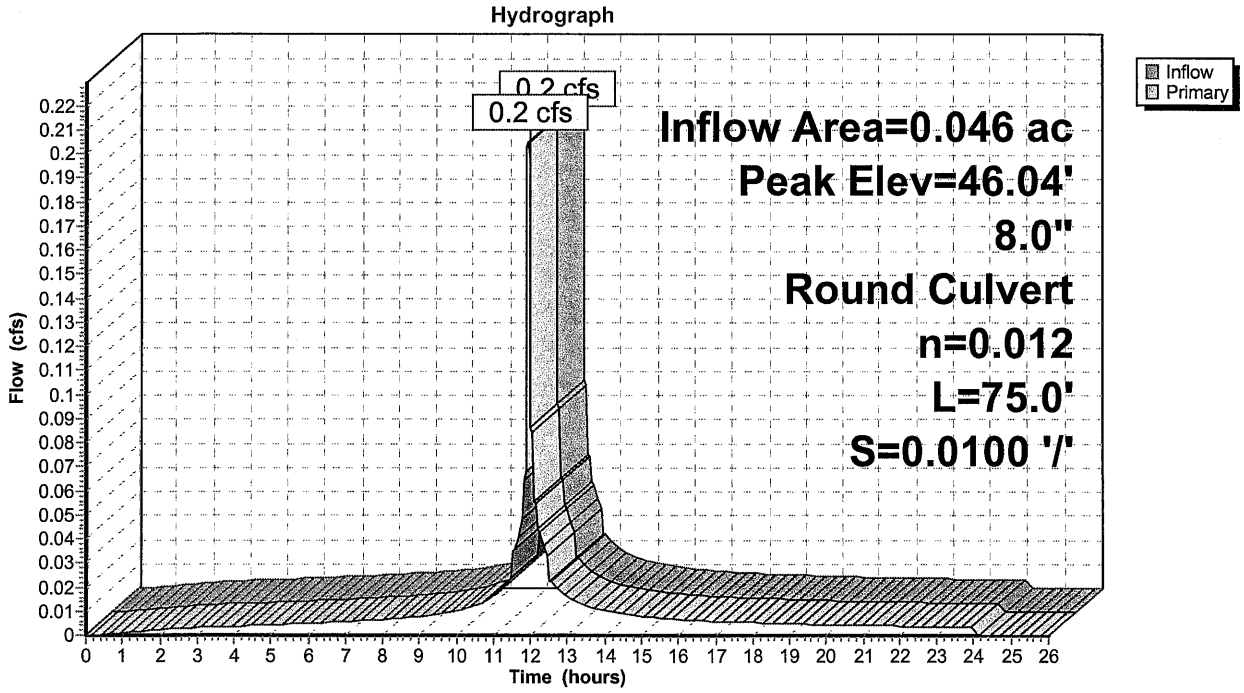
Inflow Area = 0.046 ac,100.00% Impervious, Inflow Depth = 4.51" for 10-yr event
Inflow = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af
Outflow = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
Primary = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 46.04' @ 11.99 hrs
Flood Elev= 48.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.75'	**8.0" Round Culvert** L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 45.75' / 45.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.2 cfs @ 11.99 hrs HW=46.04' TW=43.64' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.2 cfs @ 1.44 fps)

Pond RD6: RD6



Summary for Pond RD7: RD7

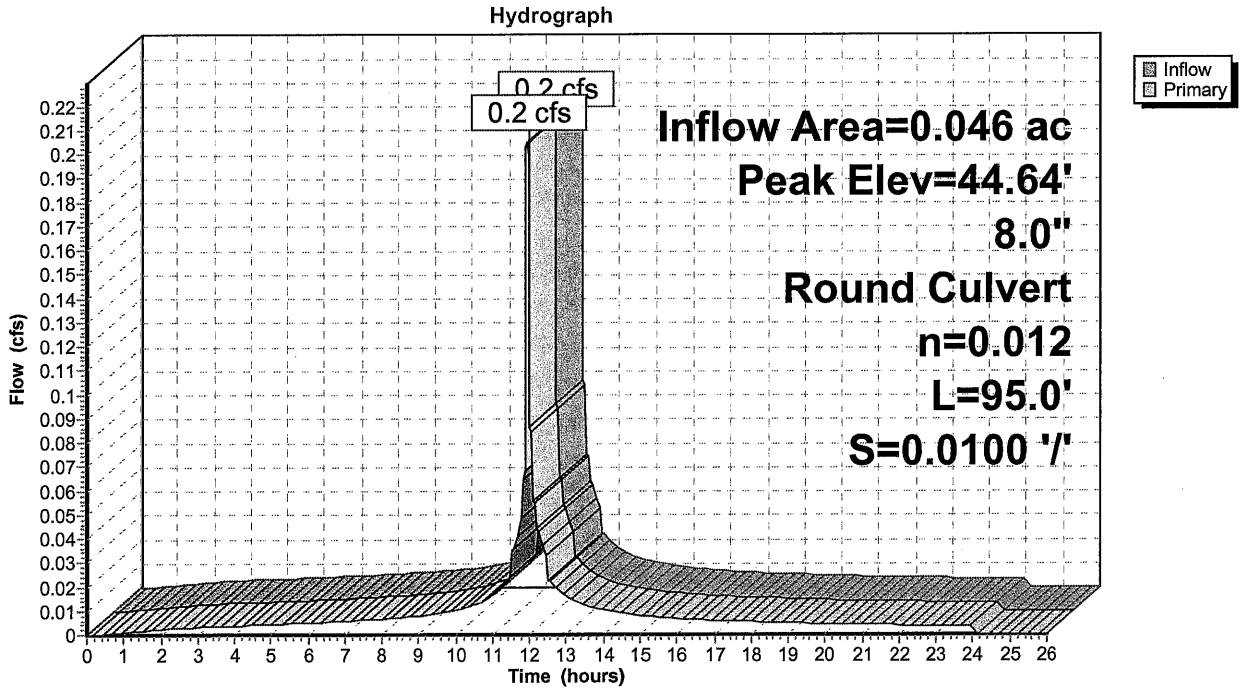
Inflow Area = 0.046 ac,100.00% Impervious, Inflow Depth = 4.51" for 10-yr event
Inflow = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af
Outflow = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
Primary = 0.2 cfs @ 11.99 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 44.64' @ 11.99 hrs
Flood Elev= 45.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	44.35'	**8.0" Round Culvert** L= 95.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 44.35' / 43.40' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.2 cfs @ 11.99 hrs HW=44.64' TW=43.64' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.2 cfs @ 1.44 fps)

Pond RD7: RD7



Summary for Pond YD1: YD1

Inflow Area = 0.209 ac, 39.95% Impervious, Inflow Depth = 2.86" for 10-yr event
Inflow = 0.3 cfs @ 11.99 hrs, Volume= 0.050 af
Outflow = 0.3 cfs @ 11.99 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.0 min
Primary = 0.3 cfs @ 11.99 hrs, Volume= 0.050 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-26.00 hrs, dt= 0.01 hrs
Peak Elev= 63.90' @ 0.00 hrs Surf.Area= 1 sf Storage= 0 cf
Flood Elev= 65.75' Surf.Area= 190 sf Storage= 141 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (836.9 - 836.9)

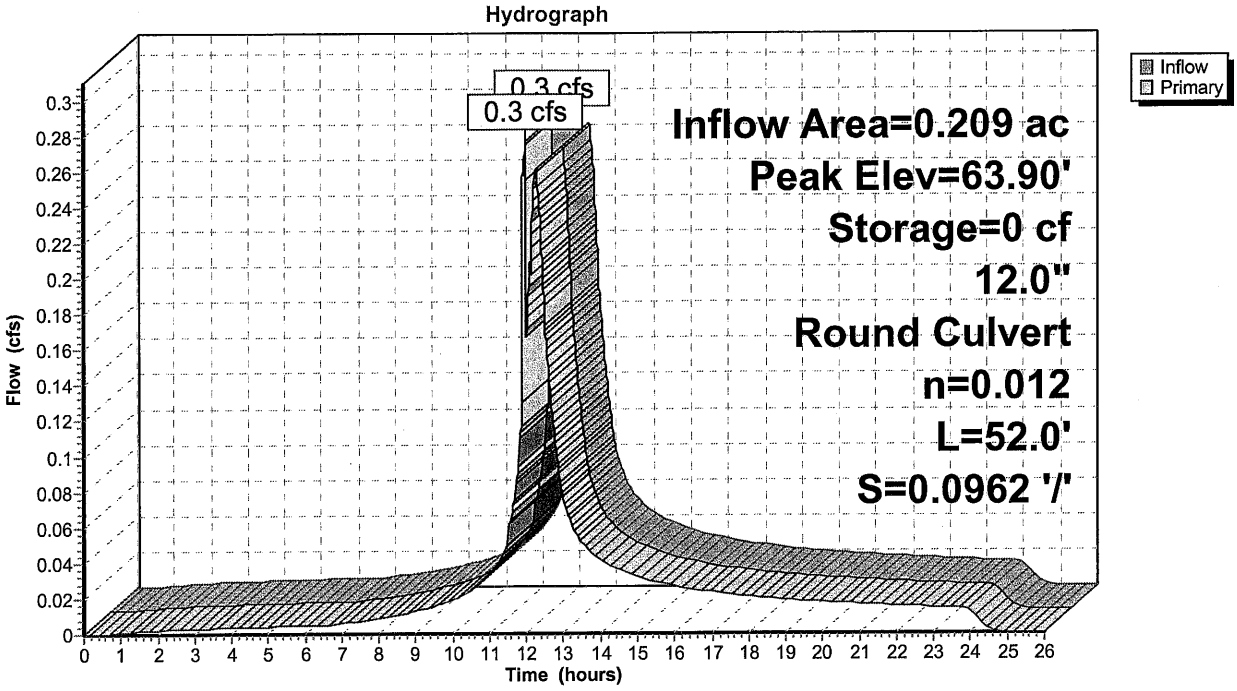
Volume	Invert	Avail.Storage	Storage Description
#1	63.90'	141 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

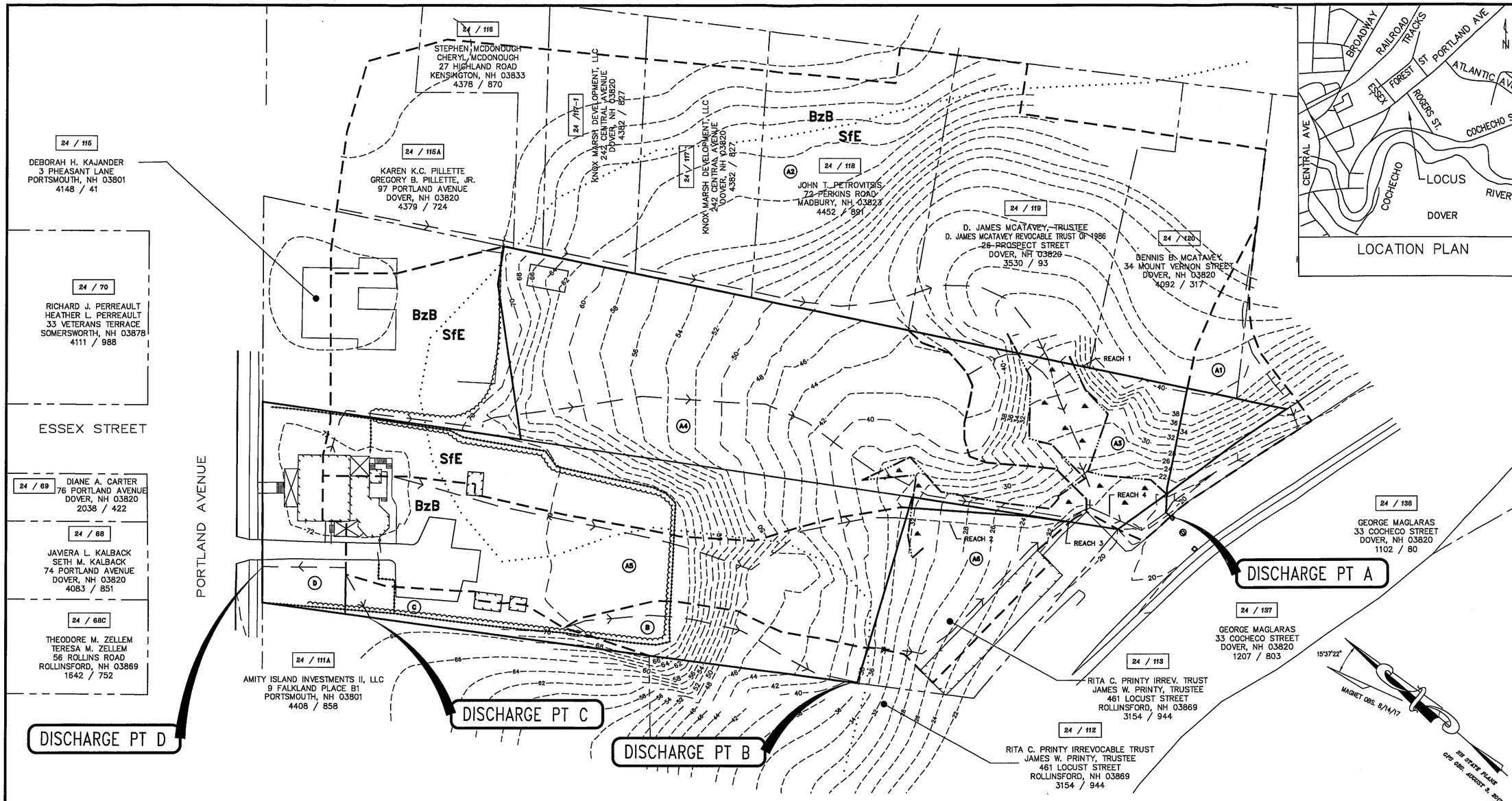
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
63.90	1	3.1	0	0	1
64.00	9	11.2	0	0	10
65.75	190	51.5	140	141	219

Device	Routing	Invert	Outlet Devices
#1	Primary	58.50'	**12.0" Round Culvert** L= 52.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 58.50' / 53.50' S= 0.0962 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.0 cfs @ 11.99 hrs HW=63.90' TW=53.63' (Dynamic Tailwater)
1=Culvert (Passes 0.0 cfs of 8.4 cfs potential flow)

Pond YD1: YD1


Hydrograph
Inflow
Primary
0.3 cfs
0.3 cfs
Inflow Area=0.209 ac
Peak Elev=63.90'
Storage=0 cf
12.0"
Round Culvert
n=0.012
L=52.0'
S=0.0962 '/'
Flow (cfs)
0 0.02 0.04 0.06 0.08 0.1 0.12 0.14 0.16 0.18 0.2 0.22 0.24 0.26 0.28 0.3
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
Time (hours)



POST-DEVELOPMENT WATERSHED CHARACTERISTICS:

SUBCATCHMENT DESIGNATION	AREA (SF)	LONGEST FLOW PATH (FEET)	Tc (MIN)
A1	5,685	219	7.8
A2	69,947	440	19.5
A3	9,221	185	6.0
A4	49,460	474	28.2
A5	18,276	313	15.7
A6	5,605	144	7.0
B	4,269	179	8.9
C	2,698	29	7.0
D	4,820	49	10.7

SOILS DATA:

SOIL GROUP	NRCS SYMBOL & NAME
C/D	BzB – BUXTON SILT LOAM
C	SfE – SUFFIELD SILT LOAM

NOTES:

1. SOILS INFORMATION TAKEN FROM NATIONAL COOPERATIVE SOIL SURVEY (NRCS) FOR STRAFFORD COUNTY, NH.
2. TOPOGRAPHIC INFORMATION TAKEN FROM "TOPOGRAPHIC PLAN OF LAND FOR MICHAEL SPINELLI JR. TAX MAP 24, LOT NO. 114, 67 PORTLAND AVENUE AND DEAN STREET HOLDINGS, INC. TAX MAP 24, LOT NO. 1158, COCHECO STREET, CITY OF DOVER, COUNTY OF STRAFFORD, STATE OF NEW HAMPSHIRE, DATED DECEMBER 28, 2017 PREPARED BE MCENEANEY SURVEY ASSOCIATES, INC." AND OTHER PUBLICLY AVAILABLE SOURCES.

LEGEND:

- EX 2' CONTOUR
- EX 10' CONTOUR
- 42 PROPOSED CONTOUR
- EX TREELINE
- NRCS BOUNDARY
- BzB NRCS SYMBOL
- PROPERTY LINE
- SUBCATCHMENT BOUNDARY
- LONGEST FLOW PATH WITH DIRECTION OF FLOW
- (A2) SUBCATCHMENT DESIGNATION
- REACH
- WETLANDS

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

NO.	REVISION	APP'D	DATE

DATE: 6-22-18
SCALE: 1"=30'
DRAWN BY: MMR
DESIGN BY: MMR
APPROVED BY:SJH
PROJECT NO:1795
FILE:1795-DRN1

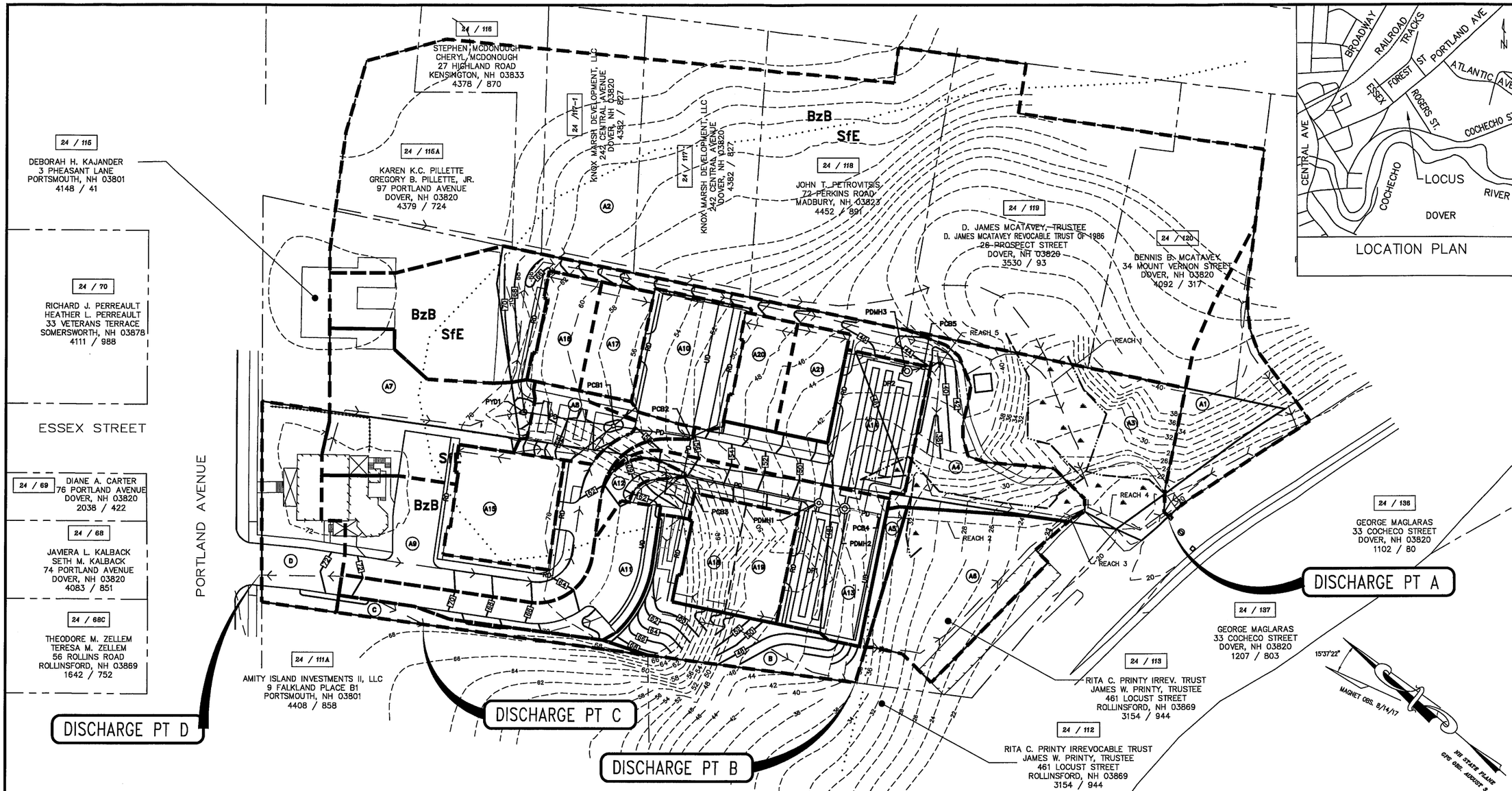
CIVILWORKS NEW ENGLAND
CIVIL ENGINEERING
181 Watson Road, P.O. Box 1186
Dover, New Hampshire 03820
(603) 749-0443

PRE-DEVELOPMENT DRAINAGE PLAN

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH

COCHECO LANDING
PORTLAND AVE &
COCHECO ST.
DOVER, NH

SW-1



POST-DEVELOPMENT WATERSHED CHARACTERISTICS:

SUBCATCHMENT DESIGNATION	AREA (SF)	LONGEST FLOW PATH (FEET)	Tc (MIN)
A1	5,685	219	7.8
A2	69,947	440	19.5
A3	9,105	185	8.0
A4	13,913	491	12.7
A5	613	11	0.9
A6	6,605	144	7.0
A7	7,186	131	23.7
A8	1,995	65	4.1
A9	7,850	281	3.1
A10	4,014	29	2.2
A11	4,672	32	3.7
A12	757	48	0.1
A13	5,461	134	2.5
A14	5,961	45	1.8
A15	3,904	31	0.2
A16	1,920	31	0.2
A17	1,984	31	0.2
A18	1,920	31	0.2
A19	1,984	31	0.2
A20	1,920	31	0.2
A21	1,984	31	0.2
B	4,770	181	12.7
C	1,110	29	7.0
D	4,743	49	10.7

SOILS DATA:

SOIL GROUP	NRCS SYMBOL & NAME
C/D	BzB – BUXTON SILT LOAM
C	SfE – SUFFIELD SILT LOAM

NOTES:

1. SOILS INFORMATION TAKEN FROM NATIONAL COOPERATIVE SOIL SURVEY (NRCS) FOR STRAFFORD COUNTY, NH.
2. TOPOGRAPHIC INFORMATION TAKEN FROM "TOPOGRAPHIC PLAN OF LAND FOR MICHAEL SPINELLI JR. TAX MAP 24, LOT NO. 114, 87 PORTLAND AVENUE AND DEAN STREET HOLDINGS, INC. TAX MAP 24, LOT NO. 115B, COCHECO STREET, CITY OF DOVER, COUNTY OF STRAFFORD, STATE OF NEW HAMPSHIRE, DATED DECEMBER 28, 2017 PREPARED BE MCENEANEY SURVEY ASSOCIATES, INC.," AND OTHER PUBLICLY AVAILABLE SOURCES.

LEGEND:

- EX 2' CONTOUR
- EX 10' CONTOUR
- 42 PROPOSED CONTOUR
- EX TREELINE
- NRCS BOUNDARY
- BzB NRCS SYMBOL
- PROPERTY LINE
- SUBCATCHMENT BOUNDARY
- LONGEST FLOW PATH WITH DIRECTION OF FLOW
- A2 SUBCATCHMENT DESIGNATION
- REACH
- WETLANDS

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

NO.	REVISION	APP'D	DATE

DATE: 6-22-18
SCALE: 1"=30'
DRAWN BY: MMR
DESIGN BY: MMR
APPROVED BY:SJH
PROJECT NO.:1795
FILE:1795-DRN1

CIVILWORKS NEW ENGLAND
CIVIL ENGINEERING
181 Watson Road, P.O. Box 1166
Dover, New Hampshire 03820
(603) 749-0443

POST-DEVELOPMENT DRAINAGE PLAN

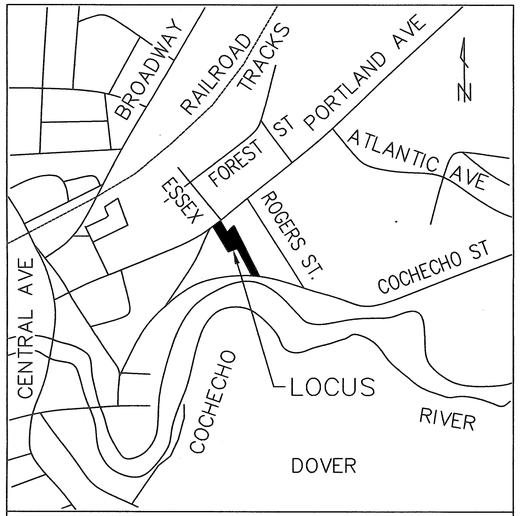
MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH

COCHECO LANDING
PORTLAND AVE &
COCHECO ST.
DOVER, NH

SW-2

SITE PLAN
COCHECO LANDING
A RESIDENTIAL APARTMENT DEVELOPMENT

TAX MAP 24, LOT 114 &
TAX MAP 24, LOT 115B
COCHECO STREET
PORTLAND AVE
DOVER, NH
JULY 18, 2018



LOCATION PLAN
(NO SCALE)

GENERAL NOTES:

1. THE INTENT OF THIS PLAN IS TO SHOW SITE IMPROVEMENTS ASSOCIATED WITH THE CONSTRUCTION OF 4 – 5 STORY APARTMENT BUILDINGS. EACH BUILDING WILL HAVE A PARKING GARAGE BENEATH AND FOUR FLOORS OF APARTMENTS ABOVE, SURFACE PARKING FOR EACH BUILDING AND A WALKING PATH TO COCHECO STREET.
2. THE FOLLOWING LOCAL, STATE AND/OR FEDERAL PERMITS HAVE BEEN ISSUED FOR THIS PROJECT:
   CITY OF DOVER: SITE PLAN APPROVAL: PENDING
   CITY OF DOVER: CONDITIONAL USE PERMIT: PENDING
   NHDES WETLAND IMPACT PERMIT: PENDING
3. VARIANCE/SPECIAL EXCEPTIONS GRANTED BY THE CITY OF DOVER ZONING BOARD OF ADJUSTMENT: NONE REQUIRED
4. A LETTER OF CREDIT FOR THE COST OF REVEGETATING ALL DISTURBED AREAS ON THE SITE SHALL BE SUBMITTED PRIOR TO ANY EARTH DISTURBING ACTIVITY OCCURS.
5. A PRE–CONSTRUCTION CONFERENCE WITH THE DEVELOPER, THE DESIGN ENGINEER, THE EARTHWORK CONTRACTOR AND THE CITY ENGINEER SHALL OCCUR PRIOR TO ANY EARTH DISTURBING ACTIVITY.
6. A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IS REQUIRED FOR THIS PROJECT. THE SWPPP MUST INCLUDE THE APPROPRIATE BEST MANAGEMENT PRACTICES (BMP'S) TO MINIMIZE THE DISCHARGE OF POLLUTANTS FROM THE SITE. PARTIES RESPONSIBLE FOR DEVELOPING THE SWPPP SHOULD REFER TO THE EPA NPDES CONSTRUCTION GENERAL PERMITS NOTICE OF INTENT FOR A COMPLETE OUTLINE OR REQUIRED ELEMENTS. THESE PLANS AND THE STORMWATER MANAGEMENT SYSTEM INSPECTION & MAINTENANCE PLAN PREPARED FOR THIS PROJECT MAY BE UTILIZED IN FULFILLING THE REQUIREMENTS.
7. UPON COMPLETION OF CONSTRUCTION, THE OWNER SHALL BE RESPONSIBLE FOR COMPLIANCE WITH THE STORMWATER MANAGEMENT SYSTEM INSPECTION & MAINTENANCE PLAN AND THE REPORTING REQUIREMENTS CONTAINED THEREIN.
8. PURSUANT TO CITY OF DOVER ORDINANCE AND APPROVALS ASSOCIATED WITH THIS WORK, CONSTRUCTION HOURS SHALL BE LIMITED TO MONDAY – FRIDAY 7AM – 6PM, SATURDAY 8AM – 5PM, WITH NO SUNDAY HOURS. HOURS OF CONSTRUCTION SHALL BE DOCUMENTED ON A SITE CONSTRUCTION SIGN ALONG WITH THE CONTACT INFORMATION FOR GENERAL CONTRACTOR. SAID SIGNAGE SHALL BE LOCATED AND APPROVED BY THE CITY ENGINEER OR DIRECTOR OF PLANNING AND COMMUNITY DEVELOPMENT.
9. AS–BUILT PLANS OF THE SITE SHALL BE SUBMITTED ON REPRODUCIBLE MYLAR MEDIUM AND IN A DIGITAL DXF FORMAT ON DISK TO THE CITY ENGINEER'S OFFICE UPON COMPLETION OF THE PROJECT. AS–BUILT PLANS SHALL BE PREPARED AND CERTIFIED CORRECT BY A P.E. OR AN L.L.S.

OWNER
MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

SITE CIVIL ENGINEER
CIVILWORKS NEW ENGLAND
CIVIL ENGINEERING
181 Watson Road, P.O. Box 1166
Dover, New Hampshire 03820
(603) 749-0443

LAND SURVEYOR
MCENEANEY SURVEY ASSOCIATES, INC.
P.O. BOX 681
24 CHESTNUT STREET
DOVER, NH 03820

WETLAND SCIENTIST
MICHAEL CUOMO
6 YORK POND ROAD
YORK, ME 03909

GOVE ENVIRONMENTAL SERVICES, INC.
8 CONTINENTAL DRIVE, BLDG 2 UNIT H
EXETER, NH 03833

LANDSCAPE ARCHITECT
WOODBURN & COMPANY
LANDSCAPE ARCHITECTURE, LLC
130 KENT PLACE
NEWMARKET, NH 03857

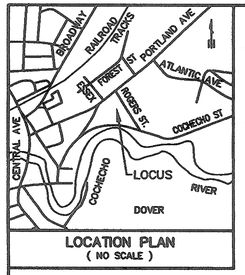
ARCHITECT
CJ ARCHITECTS
233 VAUGHAN ST.
PORTSMOUTH, NH 03801

MARKER 44 HOLDINGS, LLC _____ DATE

SHEET INDEX

	SHEET
COVER SHEET	-
TOGRAPHIC PLAN OF LAND (By McEneaney Survey Associates)	-
LOT LINE ADJUSTMENT PLAN (By McEneaney Survey Associates)	-
DEMOLITION PLAN	4
SITE PLAN	5
GRADING, DRAINAGE & EROSION CONTROL PLAN	6
UTILITY PLAN	7
WETLAND & BUFFER IMPACT PLAN	8
EROSION CONTROL NOTES	9
EROSION CONTROL DETAILS	10
DETAILS	11
LIGHTING PLAN	12
LIGHTING DETAILS	13
LANDSCAPE PLAN (By Woodburn & Company)	-
ELEVATIONS	-

PLANNING FILE NO.: P__-__



LOCATION PLAN
(NO SCALE)

No.	Bearing	Distance
L1	S31°39'37"E	47.78'
L2	N59°12'58"E	22.00'
L3	N73°16'23"W	35.25'

REFERENCE PLANS:

1.) SUBDIVISION OF LAND DOVER, NEW HAMPSHIRE – THOMAS DUMONT, SANFORD, MAINE. SCALE: 1" = 30'; DATED: NOVEMBER 26, 1984; BY: JOHN W. DURGIN ASSOCIATES, INC. RECORDED S.C.R.D. PLAN 24A–159.

2.) PLAN OF LAND OF JOHN PRINTY – COCHECO STREET, DOVER, NEW HAMPSHIRE. SCALE: 1" = 30'; DATED: APRIL 6, 1988; BY: CIVIL CONSULTANTS. RECORDED S.C.R.D. PLAN 33A–86.

3.) LOT RESTORATION PLAN FOR KNOX MARSH DEVELOPMENT, LLC. 28 ROGERS STREET, DOVER, NH TAX MAP 24, LOT 117. SCALE: 1" = 10'; DATED: AUGUST 22, 2016; BY: BERRY SURVEYING AND ENGINEERING. RECORDED S.C.R.D. PLAN 113–53.

4.) SUBDIVISION OF LAND DOVER, N.H. FOR TIMOTHY G. PEARSON. SCALE: 1" = 30'; DATED: SEPTEMBER 10, 1979; BY: JOHN W. DURGIN ASSOCIATES, INC. RECORDED S.C.R.D. PLAN 20D–29.

5.) COCHECO STREET LAYOUT FOR THE CITY OF DOVER, N.H. SCALE: 1" = 50'; DATED: AUGUST 1, 1990, REVISED THROUGH AUGUST 22, 1990; BY: BRUCE L. POHOPEK. RECORDED S.C.R.D. PLAN 40–82.

15°37'22" MAGNET OBS. 8/14/17

NH STATE PLANE GPS OBS. AUGUST 8, 2017

24 / 116 STEPHEN MCDONOUGH, CHERYL MCDONOUGH, 27 HIGHLAND ROAD, KENSINGTON, NH 03833, 4378 / 870

24 / 117-1 KNOX MARSH DEVELOPMENT, LLC, 242 CENTRAL AVENUE, DOVER, NH 03820, 4382 / 827

24 / 115A KAREN K.C. PILLETTE, GREGORY B. PILLETTE, JR., 97 PORTLAND AVENUE, DOVER, NH 03820, 4379 / 724

24 / 117 KNOX MARSH DEVELOPMENT, LLC, 242 CENTRAL AVENUE, DOVER, NH 03820, 4382 / 827

24 / 118 JOHN T. PETROVITSIS, 72 PERKINS ROAD, MADBURY, NH 03823, 4452 / 891

24 / 119 D. JAMES MCATAVEY, TRUSTEE, D. JAMES MCATAVEY REVOCABLE TRUST OF 1986, 26 PROSPECT STREET, DOVER, NH 03820, 3530 / 93

24 / 120 DENNIS B. MCATAVEY, 34 MOUNT VERNON STREET, DOVER, NH 03820, 4092 / 317

24 / 121 BARBARA A. ZIELFELDER, RICHARD ZIELFELDER, JR., 10 ROGERS STREET, DOVER, NH 03820, 3963 / 625

24 / 135A GEORGE MAGLARAS, 33 COCHECO STREET, DOVER, NH 03820, 2612 / 358

24 / 70 RICHARD J. PERREAULT, HEATHER L. PERREAULT, 33 VETERANS TERRACE, SOMERSWORTH, NH 03878, 4111 / 988

ESSEX STREET

24 / 69 DIANE A. CARTER, 76 PORTLAND AVENUE, DOVER, NH 03820, 2038 / 422

24 / 68 JAVIERA L. KALBACK, SETH M. KALBACK, 74 PORTLAND AVENUE, DOVER, NH 03820, 4083 / 851

24 / 68C THEODORE M. ZELLEM, TERESA M. ZELLEM, 56 ROLLINS ROAD, ROLLINSFORD, NH 03869, 1642 / 752

24 / 115 D. KAJANDER & G. MAHANNA, TRUSTEES, THE MAHANNA KAJANDER REVOCABLE TRUST, 3 PHEASANT LANE, PORTSMOUTH, NH 03801, 4550 / 303

24 / 115B MARKER 44 HOLDINGS, LLC, 130 CENTRAL AVENUE, DOVER, NH 03820, 4563 / 175

24 / 114 MARKER 44 HOLDINGS, LLC, 130 CENTRAL AVENUE, DOVER, NH 03820, 4562 / 656

24 / 111A AMITY ISLAND INVESTMENTS II, LLC, 9 FALKLAND PLACE B1, PORTSMOUTH, NH 03801, 4408 / 858

24 / 112 RITA C. PRINTY IRREVOCABLE TRUST, JAMES W. PRINTY, TRUSTEE, 461 LOCUST STREET, ROLLINSFORD, NH 03869, 3154 / 944

24 / 113 RITA C. PRINTY IRREV. TRUST, JAMES W. PRINTY, TRUSTEE, 461 LOCUST STREET, ROLLINSFORD, NH 03869, 3154 / 944

24 / 137 GEORGE MAGLARAS, 33 COCHECO STREET, DOVER, NH 03820, 1207 / 803

24 / 136 GEORGE MAGLARAS, 33 COCHECO STREET, DOVER, NH 03820, 1102 / 80

24 / 138 GEORGE MAGLARAS, 33 COCHECO STREET, DOVER, NH 03820, 1208 / 46

TBM MAG HUB AT SIDEWALK ELEV. 71.66

FINISH FLOOR ELEV. 75.0

STEEL STAKE FOUND DAVIS CAP, DOWN 4" N – 255,992.923 E – 1,197,097.365 (SEE NOTE 7)

MON (TBS)

IRON PIPE FOUND 1"ø, UP 18"

IRON PIPE FOUND 1 3/4"ø, UP 15"

CONCRETE BOUND FOUND WITH 1"ø IRON PIPE WITNESS

IRON PIPE FOUND 3"ø, UP 6"

STEEL STAKE FOUND N26°22'29"W, 8.55' TO LOT CORNER

IRON ROD FOUND, CIVIL CONSULTANTS CAP, UP 14"

IRON ROD FOUND, FLUSH

IRON PIPE FOUND 1"ø, UP 12"

TBM MAG NAIL IN SIDEWALK ELEV. 20.88

IRON PIPE FOUND 2"ø, DOWN 2" N – 255,918.486 E – 1,197,008.818 (SEE NOTE 7)

IRON PIPE FOUND 1 1/2"ø, UP 6"

IRON ROD FOUND, CIVIL CONSULTANTS CAP, UP 6"

PAVED PARKING (SEE NOTE 11)

PAVED DRIVE

WOOD STOCKADE FENCE

DILAPIDATED SHED

SPRING OR SEEP

WETLAND FLAG WF1 – WF15

50' DOVER WETLAND BUFFER

PARCEL AREA 39,463 S.F. 0.91 Ac.

PARCEL AREA 41,164 S.F. 0.94 Ac.

HOUSE #87

SHED

PORTLAND AVENUE

COCHECHO STREET

COCHECHO RIVER TIDAL FLOW EBB

ZONE – CBD DG

ZONE – RMU

ZONE – CWD

LINE – CBD DG

LINE – RMU

LINE – CWD

N49°56'52"E 115.68'

N41°25'29"E 90.38'

S31°58'37"E 103.74'

S31°39'37"E 229.67'

S28°22'47"E 239.92'

S28°14'01"E 224.34'

N31°01'01"W 120.36'

N75°46'23"W 85.14'

S56°50'40"W 111.68'

N32°17'14"W 226.12'

N32°32'56"W 121.68'

NOTES:

1.) OWNER OF RECORD:

24 / 114 MARKER 44 HOLDINGS, LLC, 130 CENTRAL AVENUE, DOVER, NEW HAMPSHIRE 03820, S.C.R.D. VOLUME 4563, PAGE 175

24 / 115B MARKER 44 HOLDINGS, LLC, 130 CENTRAL AVENUE, DOVER, NEW HAMPSHIRE 03820, S.C.R.D. VOLUME 4562, PAGE 656

2.) 24 / 114 – DENOTES TAX MAP AND PARCEL NUMBER.

3.) PARCEL AREAS:

24 / 114 = 41,164 S.F. / 0.94 Ac.

24 / 115B = 39,463 S.F. / 0.91 Ac.

4.) THE INTENT OF THIS PLAN IS TO DEPICT THE PARCELS BOUNDARIES AND EXISTING SITE CONDITIONS AS OF DECEMBER 18, 2017.

5.) ZONING DISTRICTS:

CBD DOWNTOWN GATEWAY SUB–DISTRICT (CBD DG)
DIMENSIONAL REQUIREMENTS:

MINIMUM LOT SIZE	= N/A
MINIMUM LOT COVERAGE	= 50 PERCENT
FRONTAGE BUILD–OUT	= 60 PERCENT MINIMUM
FRONT BUILD TO LINE	= 5 FEET MIN. / 20 FEET MAX.
SIDE SETBACK	= 5 FEET MIN.
REAR SETBACK	= 0 FEET MIN.
MAXIMUM BUILDING HEIGHT	= 2 STORY MIN. / 4 STORY MAX.

COCHECHO WATERFRONT DISTRICT (CWD)
DIMENSIONAL REQUIREMENTS:

MINIMUM LOT SIZE	= N/A
MAXIMUM LOT COVERAGE	= 75 PERCENT
MINIMUM FRONTAGE	= N/A
FRONT SETBACK	= 0 FEET
SIDE SETBACK	= 0 FEET
REAR SETBACK	= 0 FEET
MAXIMUM BUILDING HEIGHT	= 55 FEET

NOTES CONTINUED:

6.) THE SUBJECT PARCELS ARE NOT LOCATED WITHIN THE 0.2 PERCENT ANNUAL CHANCE FLOODPLAIN AS SHOWN ON FLOOD INSURANCE RATE MAP COMMUNITY NUMBER 330145; PANEL 0330; SUFFIX E; MAP NUMBER 33017C0330E; EFFECTIVE DATE SEPT. 30, 2015.

7.) BASIS OF BEARING IS NH STATE PLANE (NAD83) BASED ON GPS OBSERVATION DATED AUGUST 3, 2017. VERTICAL DATUM IS NH STATE PLANE (NAD83) BASED ON GPS OBSERVATION DATED AUGUST 3, 2017.

8.) PROPERTY LINE INFORMATION HAS BEEN OBTAINED FROM A SURVEY PERFORMED BY MCENEANEY SURVEY ASSOCIATES, INC. ON DECEMBER 18, 2017 WITH AN ERROR NOT GREATER THAN 1 IN 10,000.

9.) PARCEL IS SUBJECT TO THE STATE OF NEW HAMPSHIRE SHORELINE WATER QUALITY PROTECTION ACT (SWQPA). THOSE AREAS WITHIN 250 FEET OF THE COCHECHO RIVER REFERENCE LINE.

10.) WETLANDS WERE DELINEATED ON NOVEMBER 30, 2017 BY MICHAEL CUOMO, CERTIFIED WETLANDS SCIENTIST #004 AND FIELD LOCATED BY THIS OFFICE ON DECEMBER 15, 2017.

11.) THE ABUTTERS PAVED PARKING AREA APPEARS TO ENCROACH ONTO PARCEL 24 / 115B (TWO PLACES, TWO ABUTTERS).

LEGEND

MON (TBS) O – BOUNDARY MONUMENT (TO BE SET)
S.C.R.D. – STRAFFORD COUNTY REGISTRY OF DEEDS
S.C.R.P. – STRAFFORD COUNTY REGISTRY OF PROBATE
S.F. – SQUARE FEET
Ac. – ACRE
(TYP.) – TYPICAL
ø – DIAMETER
-o- UP – UTILITY POLE
OHU – OVERHEAD UTILITY LINES
VGC – VERTICAL GRANITE CURB
CB – CATCH BASIN
DMH – DRAIN MANHOLE
SMH – SEWER MANHOLE
WETLANDS
WF2 / A6 – WETLAND FLAG I.D.
48 – CONTOUR LINE (2 FOOT INTERVAL)

NO.	DATE	DESCRIPTION	BY	CHK
2	7/12–18	ADD ADD'L WETLAND, BUFFER, UPDATE ABUTTER	RJM	KMM
1	5/22/18	REVISE OWNERS OF RECORD	RJM	KMM

REVISIONS

17–2168	TOPOGRAPHIC	17–07	63–74
PROJECT NO	TYPE	FIELDBOOK & PAGES	

TOPOGRAPHIC PLAN OF LAND

PREPARED FOR
MARKER 44 HOLDINGS, LLC
TAX MAP 24, LOT No. 114
87 PORTLAND AVENUE
AND
MARKER 44 HOLDINGS, LLC
TAX MAP 24, LOT No. 115B
COCHECHO STREET
CITY of DOVER
COUNTY of STRAFFORD
STATE of NEW HAMPSHIRE

DOVER PLANNING FILE No. P 18–__

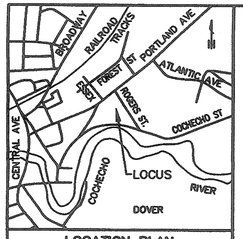
DRAWN BY: RJM | FILE: W10 CP\2168\17–2168–1A
SCALE: 1" = 30' | DATE: DECEMBER 26, 2017

30 15 0 15 30 60 90 120

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 661 KEVIN M. McENEANEY

McEneaney Survey Associates, inc.
P.O. Box 681 – 24 CHESTNUT STREET
DOVER, NH 03820 (603) 742–0911

SURVEYING – PLANNING – CONSULTING



LOCATION PLAN
(NO SCALE)

No.	Bearing	Distance
L1	S31°39'37"E	47.78'
L2	N59°12'58"E	22.00'
L3	N73°16'23"W	35.25'

REFERENCE PLANS:

1.) SUBDIVISION OF LAND DOVER, NEW HAMPSHIRE – THOMAS DUMONT, SANFORD, MAINE. SCALE: 1" = 30'; DATED: NOVEMBER 26, 1984; BY: JOHN W. DURGIN ASSOCIATES, INC. RECORDED S.C.R.D. PLAN 24A–159.

2.) PLAN OF LAND OF JOHN PRINTY – COCHECHO STREET, DOVER, NEW HAMPSHIRE. SCALE: 1" = 30'; DATED: APRIL 6, 1988; BY: CIVIL CONSULTANTS. RECORDED S.C.R.D. PLAN 33A–86.

3.) LOT RESTORATION PLAN FOR KNOX MARSH DEVELOPMENT, LLC. 28 ROGERS STREET, DOVER, NH TAX MAP 24, LOT 117. SCALE: 1" = 10'; DATED: AUGUST 22, 2016; BY: BERRY SURVEYING AND ENGINEERING. RECORDED S.C.R.D. PLAN 113–53.

4.) SUBDIVISION OF LAND DOVER, N.H. FOR TIMOTHY G. PEARSON. SCALE: 1" = 30'; DATED: SEPTEMBER 10, 1979; BY: JOHN W. DURGIN ASSOCIATES, INC. RECORDED S.C.R.D. PLAN 20D–29.

5.) COCHECHO STREET LAYOUT FOR THE CITY OF DOVER, N.H. SCALE: 1" = 50'; DATED: AUGUST 1, 1990, REVISED THROUGH AUGUST 22, 1990; BY: BRUCE L. POHOPEK. RECORDED S.C.R.D. PLAN 40–82.

24 / 116
STEPHEN MCDONOUGH
CHERYL MCDONOUGH
27 HIGHLAND ROAD
KENSINGTON, NH 03833
4378 / 870

24 / 115A
KAREN K.C. PILLETTE
GREGORY B. PILLETTE, JR.
97 PORTLAND AVENUE
DOVER, NH 03820
4379 / 724

24 / 117–1
KNOX MARSH DEVELOPMENT, LLC
242 CENTRAL AVENUE
DOVER, NH 03820
4382 / 827

24 / 117
KNOX MARSH DEVELOPMENT, LLC
242 CENTRAL AVENUE
DOVER, NH 03820
4382 / 827

24 / 118
JOHN T. PETROVITSIS
72 PERKINS ROAD
MADBURY, NH 03823
4452 / 891

24 / 119
D. JAMES MCATAVEY, TRUSTEE
D. JAMES MCATAVEY REVOCABLE TRUST OF 1986
26 PROSPECT STREET
DOVER, NH 03820
3530 / 93

24 / 120
DENNIS B. MCATAVEY
34 MOUNT VERNON STREET
DOVER, NH 03820
4092 / 317

24 / 121
BARBARA A. ZIELFELDER
RICHARD ZIELFELDER, JR.
10 ROGERS STREET
DOVER, NH 03820
3963 / 625

24 / 135A
GEORGE MAGLARAS
33 COCHECHO STREET
DOVER, NH 03820
2612 / 358

24 / 136
GEORGE MAGLARAS
33 COCHECHO STREET
DOVER, NH 03820
1102 / 80

24 / 137
GEORGE MAGLARAS
33 COCHECHO STREET
DOVER, NH 03820
1207 / 803

24 / 138
GEORGE MAGLARAS
33 COCHECHO STREET
DOVER, NH 03820
1208 / 46

24 / 70
RICHARD J. PERREAULT
HEATHER L. PERREAULT
33 VETERANS TERRACE
SOMERSWORTH, NH 03878
4111 / 988

ESSEX STREET

24 / 69
DIANE A. CARTER
76 PORTLAND AVENUE
DOVER, NH 03820
2038 / 422

24 / 68
JAVIERA L. KALBACK
SETH M. KALBACK
74 PORTLAND AVENUE
DOVER, NH 03820
4083 / 851

24 / 68C
THEODORE M. ZELLEM
TERESA M. ZELLEM
56 ROLLINS ROAD
ROLLINSFORD, NH 03869
1642 / 752

24 / 115
D. KAJANDER & G. MAHANNA, TRUSTEES
THE MAHANNA KAJANDER REVOCABLE TRUST
3 PHEASANT LANE
PORTSMOUTH, NH 03801
4550 / 303

24 / 114
MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820
S.C.R.D. VOLUME 4563, PAGE 175

24 / 115B
MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820
S.C.R.D. VOLUME 4562, PAGE 656

24 / 111A
AMITY ISLAND INVESTMENTS II, LLC
9 FALKLAND PLACE B1
PORTSMOUTH, NH 03801
4408 / 858

24 / 112
RITA C. PRINTY IRREVOCABLE TRUST
JAMES W. PRINTY, TRUSTEE
461 LOCUST STREET
ROLLINSFORD, NH 03869
3154 / 944

24 / 113
RITA C. PRINTY IRREV. TRUST
JAMES W. PRINTY, TRUSTEE
461 LOCUST STREET
ROLLINSFORD, NH 03869
3154 / 944

MON (TBS)
IRON PIPE FOUND 1"ø, UP 18"
239.92' S28°22'47"E
IRON PIPE FOUND 1 3/4"ø, UP 15"
CONCRETE BOUND FOUND WITH 1"ø IRON PIPE WITNESS
224.34' S28°14'01"E
IRON PIPE FOUND 3"ø, UP 6"
PAVED PARKING (SEE NOTE 11)
DILAPIDATED SHED
SPRING OR SEEP
ZONE – RMU
ZONE – CWD
ZONE – CBD DG
ZONE – RMU LINE – CWD
NEW PARCEL AREA
70,526 S.F.
1.62 Ac.
22' WIDE R.O.W. (SEE NOTE 12)
STEEL STAKE FOUND DAVIS CAP, DOWN 4" N – 255,992.923 E – 1,197,097.365 (SEE NOTE 7)
88.34' S31°58'37"E
N41°25'26"E 90.38'
L1
L2
L3
L4
L5
L6
[FORMER ZONE LINE LOCATION] S31°39'37"E 229.67'
LOT LINE TO BE ABANDONED
[NEW ZONE LINE LOCATION]
NEW LOT LINE
S49°54'54"W 115.21'
115.68' N49°56'52"E
PORTLAND AVENUE
VGC
SIDEWALK
5' SIDE SETBACK LINE
10' BUILD TO
HOUSE #87
PAVED DRIVE
CB
SHED
WOOD STOCKADE FENCE
N32°17'14"W 88.34'
N32°17'14"W 137.78'
121.68'
N32°32'56"W
IRON PIPE FOUND 2"ø, DOWN 2" N – 255,918.486 E – 1,197,008.818 (SEE NOTE 7)
IRON PIPE FOUND 1 1/2"ø, UP 6"
IRON ROD FOUND, CIVIL CONSULTANTS CAP, UP 6"
A 31,063 S.F. 0.71 Ac.
50' DOVER WETLAND BUFFER
WF1 WF2 WF3 WF4 WF5 WF6 WF7 WF8 WF9 WF10 WF11 WF12 WF13 WF14 WF15
120.36' N31°01'01"W
111.88' S66°50'40"W
IRON ROD FOUND, CIVIL CONSULTANTS CAP, UP 14"
IRON ROD FOUND, FLUSH
PAVED PARKING (SEE NOTE 11)
BUILDING
N75°46'23"W 85.14'
SGC
SIDEWALK
COCHECHO STREET
STEEL STAKE FOUND N26°22'29"W, 8.55' TO LOT CORNER
IRON PIPE FOUND 1"ø, UP 12"
100' LINE FROM COCHECHO RIVER
COCHECHO RIVER
TIDAL FLOW
EBB
MAGNET OBS. 8/14/17
NH STATE PLANE GPS OBS. AUGUST 8, 2017
15°37'22"

NEW PARCEL AREA
10,100 S.F.
0.23 Ac.

LEGEND

MON (TBS) O – BOUNDARY MONUMENT (TO BE SET)
S.C.R.D. – STRAFFORD COUNTY REGISTRY OF DEEDS
S.C.R.P. – STRAFFORD COUNTY REGISTRY OF PROBATE
S.F. – SQUARE FEET
Ac. – ACRE
(TYP.) – TYPICAL
ø – DIAMETER
-o- UP – UTILITY POLE
OHU – OVERHEAD UTILITY LINES
VGC – VERTICAL GRANITE CURB
CB – CATCH BASIN
DMH – DRAIN MANHOLE
SMH – SEWER MANHOLE
– WETLANDS
– EDGE OF WETLAND
WF2 / A6 – WETLAND FLAG I.D.

NOTES:

1.) OWNER OF RECORD:

24 / 114 MARKER 44 HOLDINGS, LLC 130 CENTRAL AVENUE DOVER, NEW HAMPSHIRE 03820 S.C.R.D. VOLUME 4563, PAGE 175 — OWNERS SIGNATURE

24 / 115B MARKER 44 HOLDINGS, LLC 130 CENTRAL AVENUE DOVER, NEW HAMPSHIRE 03820 S.C.R.D. VOLUME 4562, PAGE 656 — OWNERS SIGNATURE

2.) 24 / 114 – DENOTES TAX MAP AND PARCEL NUMBER.

3.) PLAN INTENT: TO ADJUST THE LOT LINES AS SHOWN. TRACT "A" 31,063 S.F. IS TO BE ADDED TO PARCEL 24 / 115B.

4.) PARCEL AREAS:

PARCEL:	24 / 114	24 / 115B
ORIGINAL	41,164 S.F. / 0.94 Ac.	39,463 S.F. / 0.91 Ac.
NEW	10,100 S.F. / 0.23 Ac.	70,526 S.F. / 1.62 Ac.

5.) ZONING DISTRICTS:

CBD DOWNTOWN GATEWAY SUB–DISTRICT (CBD DG)
DIMENSIONAL REQUIREMENTS:

MINIMUM LOT SIZE	= N/A
MINIMUM LOT COVERAGE	= 50 PERCENT
FRONTAGE BUILD–OUT	= 60 PERCENT MINIMUM
FRONT BUILD TO LINE	= 5 FEET MIN. / 20 FEET MAX.
SIDE SETBACK	= 5 FEET MIN.
REAR SETBACK	= 0 FEET MIN.
MAXIMUM BUILDING HEIGHT	= 2 STORY MIN. / 4 STORY MAX.

COCHECHO WATERFRONT DISTRICT (CWD)
DIMENSIONAL REQUIREMENTS:

MINIMUM LOT SIZE	= N/A
MAXIMUM LOT COVERAGE	= 75 PERCENT
MINIMUM FRONTAGE	= N/A
FRONT SETBACK	= 0 FEET
SIDE SETBACK	= 0 FEET
REAR SETBACK	= 0 FEET
MAXIMUM BUILDING HEIGHT	= 55 FEET

NOTES CONTINUED:

6.) THE SUBJECT PARCELS ARE NOT LOCATED WITHIN THE 0.2 PERCENT ANNUAL CHANCE FLOODPLAIN AS SHOWN ON FLOOD INSURANCE RATE MAP COMMUNITY NUMBER 330145; PANEL 0330; SUFFIX E; MAP NUMBER 33017C0330E; EFFECTIVE DATE SEPT. 30, 2015.

7.) BASIS OF BEARING IS NH STATE PLANE (NAD83) BASED ON GPS OBSERVATION DATED AUGUST 3, 2017. VERTICAL DATUM IS NH STATE PLANE (NAD83) BASED ON GPS OBSERVATION DATED AUGUST 3, 2017.

8.) PROPERTY LINE INFORMATION HAS BEEN OBTAINED FROM A SURVEY PERFORMED BY MCENEANEY SURVEY ASSOCIATES, INC. ON DECEMBER 18, 2017 WITH AN ERROR NOT GREATER THAN 1 IN 10,000.

9.) PARCEL IS SUBJECT TO THE STATE OF NEW HAMPSHIRE SHORELINE WATER QUALITY PROTECTION ACT (SWQPA). THOSE AREAS WITHIN 250 FEET OF THE COCHECHO RIVER REFERENCE LINE.

10.) WETLANDS WERE DELINEATED ON NOVEMBER 30, 2017 BY MICHAEL CUOMO, CERTIFIED WETLANDS SCIENTIST #0004 AND FIELD LOCATED BY THIS OFFICE ON DECEMBER 15, 2017.

11.) THE ABUTTERS PAVED PARKING AREA APPEARS TO ENCROACH ONTO PARCEL 24 / 115B (TWO PLACES, TWO ABUTTERS).

12.) PARCEL 24 / 115B IS BENEFITED BY A TWENTY–TWO (22) FOOT WIDE RIGHT OF WAY OVER PARCEL 24 / 115 AS SHOWN ON REFERENCE PLAN No. 1. REFERENCE IS MADE TO STIPULATIONS SPELLED OUT IN S.C.R.D. VOL. 1157, PAGE 648 REGARDING USE OF THIS RIGHT OF WAY.

NO.	DATE	DESCRIPTION	BY	CHK
		REVISIONS		
2	6/18/18	ADD ADDITIONAL WET FLAGS & BUFFER, AND	RJM	KMM
		REVISE SIZE OF TRACT "A" PER REQUEST	RJM	KMM
1	6/6/18	REVISE OWNERS OF RECORD, ADD NOTE 12	RJM	KMM

17–2168	LL ADJ	17–07	63–74
PROJECT NO	TYPE	FIELDBOOK & PAGES	

"I HEREBY CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL GROUND SURVEY PERFORMED WITH A TOTAL STATION, BY ME OR THOSE UNDER MY DIRECT SUPERVISION AND THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, SAID SURVEY MEETS OR EXCEEDS THE MINIMUM PRECISION REQUIREMENTS FOR SURVEY CLASSIFICATION "U" AS SET FORTH IN TABLE 500.1 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS."

LOT LINE ADJUSTMENT PLAN
PREPARED FOR
MARKER 44 HOLDINGS, LLC
TAX MAP 24, LOT No. 114
87 PORTLAND AVENUE
AND
MARKER 44 HOLDINGS, LLC
TAX MAP 24, LOT No. 115B
COCHECHO STREET
CITY of DOVER
COUNTY of STRAFFORD
STATE of NEW HAMPSHIRE

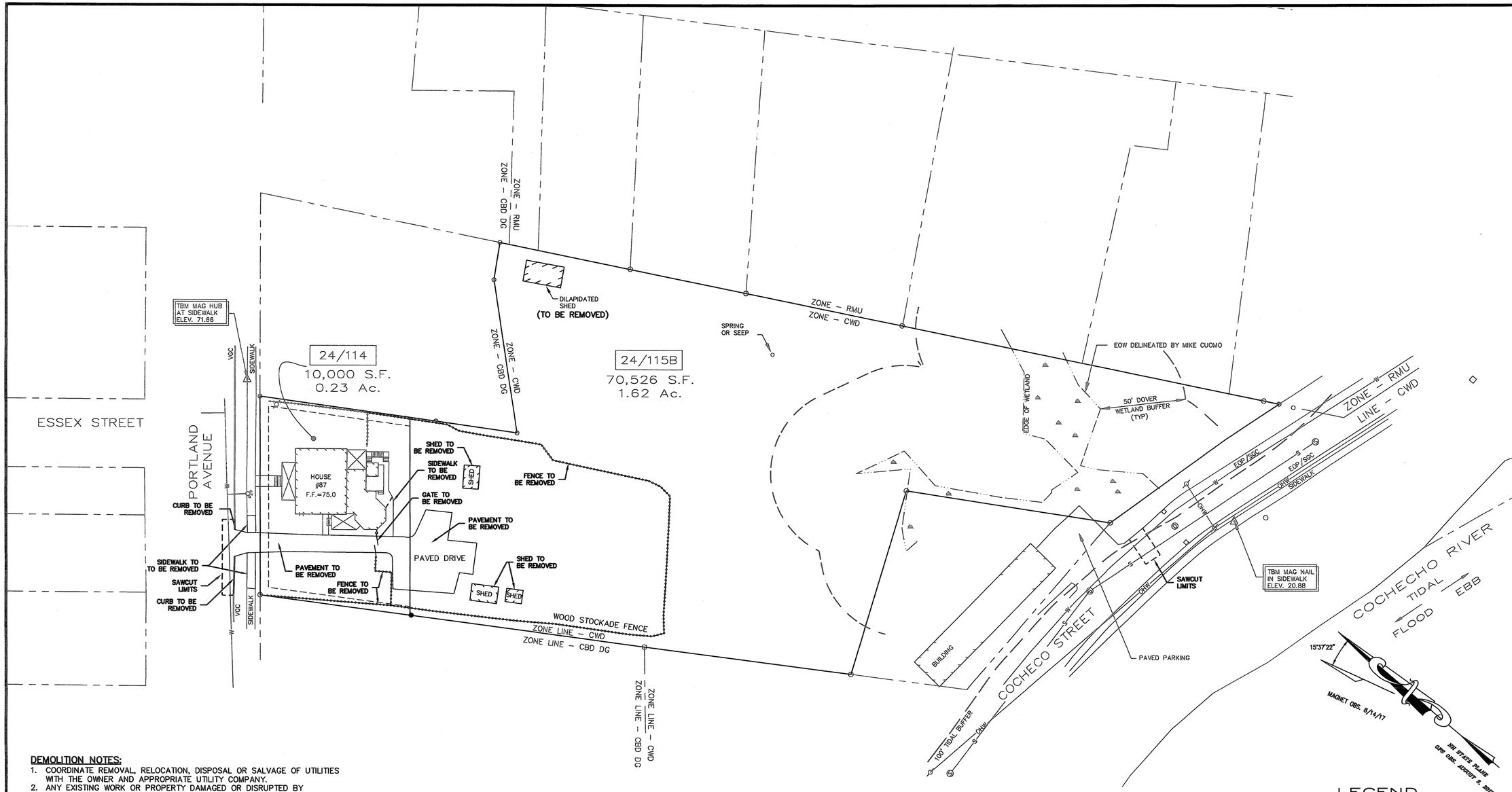
DOVER PLANNING FILE No. P 18–___

DRAWN BY: RJM | FILE: W10 CP\2168\17–2168 LLADJ–B
SCALE: 1" = 30' | DATE: APRIL 16, 2018

30 15 0 15 30 60 90 120

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 661 KEVIN M. McENEANEY SIGNATURE

McENEANEY SURVEY ASSOCIATES, INC.
P.O. Box 681 – 24 CHESTNUT STREET
DOVER, NH 03820 (603) 742–0911
SURVEYING – PLANNING – CONSULTING



DEMOLITION NOTES:

1. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
2. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
3. THE CONTRACTOR SHALL NOTIFY "DIG SAFE" PRIOR TO ANY DEMOLITION/ CONSTRUCTION ACTIVITIES. (811).
4. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, UTILITIES AND PAVEMENT ON THE SITE TO THE LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ITEMS TO BE REMOVED INCLUDE BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT AND FENCES
5. IT IS THE CONTRACTORS RESPONSIBILITY TO FAMILIARIZE HIMSELF WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
6. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS NOT ALREADY OBTAINED BY THE OWNER AND ARRANGE AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS.
8. THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATION IS NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
9. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES, AND CODES.

LEGEND

MON (TBS) O	– BOUNDARY MONUMENT (TO BE SET)
S.F.	– SQUARE FEET
Ac.	– ACRE
(TYP.)	– TYPICAL
UP	– UTILITY POLE
OHU	– OVERHEAD UTILITY LINES
VGC	– VERTICAL GRANITE CURB
EOW	– EDGE OF WETLAND
EOP	– EDGE OF PAVEMENT
SGC	– SLOPED GRANITE CURB
CB	– CATCH BASIN
DMH	– DRAIN MANHOLE
SMH	– SEWER MANHOLE
	– WETLANDS
	– EDGE OF WETLAND
WF2 / A6	– WETLAND FLAG I.D.
TBR	– TO BE REMOVED
	– FENCE
	– EXISTING BUILDING

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

CITY OF DOVER
PLANNING BOARD FILE#
P18-____

CIVILWORKS NEW ENGLAND
CIVIL ENGINEERING
181 Watson Road, P.O. Box 1166
Dover, New Hampshire 03820
(603) 749-0443

NO.	REVISION	APP'D	DATE

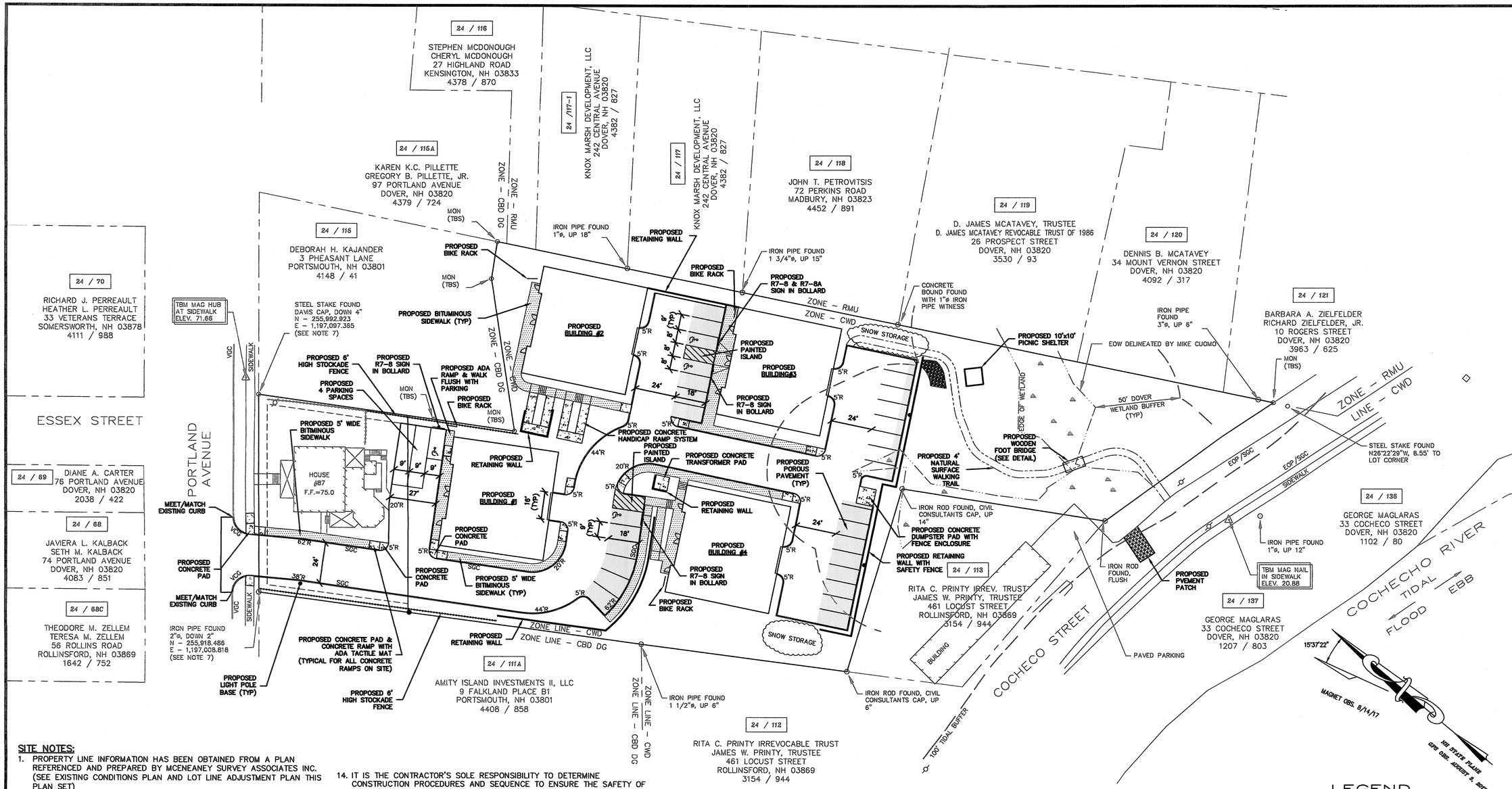
DATE: 7-18-18
SCALE: 1"=30'
DRAWN BY: SRD
DESIGN BY: MMR
APPROVED BY:SJH
PROJECT NO:1795
FILE: SITE.DWG

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

COCHECO LANDING
DOVER, NH

DEMOLITION PLAN

4



SITE NOTES:

1. PROPERTY LINE INFORMATION HAS BEEN OBTAINED FROM A PLAN REFERENCED AND PREPARED BY MCENEANEY SURVEY ASSOCIATES INC. (SEE EXISTING CONDITIONS PLAN AND LOT LINE ADJUSTMENT PLAN THIS PLAN SET)
2. EACH PROPOSED BUILDING TO HAVE A FOOTPRINT OF 3,968 SF WITH A PARKING GARAGE AS THE FIRST FLOOR AND 4 FLOORS OF APARTMENTS ABOVE.
3. THE INTENT OF THIS PLAN IS TO SHOW SITE IMPROVEMENTS ASSOCIATED WITH THE CONSTRUCTION OF 4 – 5 STORY APARTMENT BUILDINGS. EACH BUILDING WILL HAVE A PARKING GARAGE BENEATH AND FOUR FLOORS OF APARTMENTS ABOVE, SURFACE PARKING FOR EACH BUILDING AND A WALKING PATH TO COCHECO STREET.
4. EXTERIOR LIGHTING SHALL BE CUT–OFF TYPE FIXTURES PER CHAPTER 149–14–E AND SHALL PROVIDE LIGHTING DIRECTED ON–SITE ONLY.
5. FIRE DEPARTMENT CONNECTIONS SHALL BE LOCATED ON THE STREET SIDE OF THE BUILDING PER NFPA 13.
6. ALL ON–SITE UTILITIES SHALL BE INSTALLED UNDERGROUND.
7. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO APPLICABLE CITY AND STATE CODES.
8. STRIPE PARKING AREAS AS SHOWN INCLUDING HANDICAP SYMBOLS AND PAINTED ISLANDS. ALL MARKINGS SHALL BE CONSTRUCTED USING WHITE TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M–248–TYPE N.
9. ALL PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", THE "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS, AND THE AMERICAN WITH DISABILITIES ACT, LATEST EDITIONS.
10. PAINTED ISLANDS SHALL BE 4 INCHES WIDE DIAGONAL LINES 3 FEET ON CENTER.
11. ON–SITE SNOW STORAGE SHALL OCCUR ALONG THE EDGES OF PROPOSED PAVEMENT.
12. LAYOUT OF BUILDING CORNERS SHALL BE PERFORMED BY A LICENSED LAND SURVEYOR AND SHALL BE BASED UPON THE ARCHITECT'S FINAL FOUNDATION PLAN AND ALL SITE LAYOUT SHALL BE PERFORMED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR UNDER CONTRACT WITH THE CONTRACTOR.
13. SEE DETAILS FOR SIGN LEGENDS.
14. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE CONSTRUCTION PROCEDURES AND SEQUENCE TO ENSURE THE SAFETY OF THE FACILITIES AND THEIR COMPONENTS DURING DEMOLITION AND CONSTRUCTION UNLESS OTHERWISE DIRECTED BY THE OWNERS REPRESENTATIVE. THIS INCLUDES THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS OR TIE–DOWNS. SUCH MATERIALS SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AT THE COMPLETION OF THE PROJECT.
15. METHODS OF DEMOLITION, CONSTRUCTION AND ERECTION ARE THE CONTRACTOR'S RESPONSIBILITY UNLESS OTHERWISE SPECIFIED. IT IS THE CONTRACTORS' RESPONSIBILITY TO PROVIDE AND MAINTAIN ENVIRONMENTAL CONTROLS AS REQUIRED BY FEDERAL, STATE AND MUNICIPAL REGULATIONS AND PERMITS. ENVIRONMENTAL CONTROLS SHALL INCLUDE BUT SHALL NOT BE LIMITED TO DUST CONTROL AND SILT BARRIERS.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE DONE TO STRUCTURES OR UTILITIES OR INJURIES TO THE PUBLIC DURING THE CONSTRUCTION PHASE CAUSED BY HIMSELF, HIS EMPLOYEES, HIS SUBCONTRACTORS OR EMPLOYEES OF SAME. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL TEMPORARY FACILITIES FOR THE PROTECTION OF THE WORK, WORKERS AND PUBLIC SAFETY.
17. BUILDING ADDRESSES TO BE ASSIGNED BY THE BUILDING INSPECTOR AT THE TIME OF ISSUANCE OF A BUILDING PERMIT.
18. THE SITE DESIGN IS IN COMPLIANCE WITH THE APPLICABLE ACCESSIBILITY REGULATIONS 2009 IBC AND ANSI STANDARDS.
19. THE SITE SHALL BE MAINTAINED TO PROVIDE ACCESSIBILITY IN ALL WEATHER CONDITIONS.

REFERENCE PLANS:

1. TOPOGRAPHIC PLAN OF LAND, PREPARED FOR: MICHAEL J. SPINELLI, JR.; TAX MAP 24, LOT NO. 114; 87 PORTLAND AVENUE AND DEAN STREET HOLDINGS, INC; TAX MAP 21, LOT NO. 115B; COCHECHO STREET, CITY OF DOVER; COUNTY OF STRAFFORD; STATE OF NEW HAMPSHIRE; PREPARED BY MCENEANEY SURVEY ASSOCIATES, INC; SCALE 1"=30'; DATED; 12–26–17.
2. LOT LINE ADJUSTMENT PLAN, PREPARED FOR MARKER 44 HOLDINGS, LLC, TAX MAP 24 LOT NO 114 87 PORTLAND AVENUE AND MARKER 44 HOLDINGS LLC TAX MAP 24, LOT NO. 115B; COCHECHO STREET; CITY OF DOVER; COUNTY OF STRAFFORD; STATE OF NEW HAMPSHIRE; PREPARED BY MCENEANEY SURVEY ASSOCIATES, INC.; SCALE 1"=30'; DATED 4–16–18.

LEGEND

- S.C.R.D. – STRAFFORD COUNTY REGISTRY OF DEEDS
- S.C.R.P. – STRAFFORD COUNTY REGISTRY OF PROBATE
- S.F. – SQUARE FEET
- Ac. – ACRE
- (TYP.) – TYPICAL
- – WETLANDS
- – EDGE OF WETLAND
- VGC – VERTICAL GRANITE CURB
- 5'R – PAVEMENT RADIUS
- SGC – SLOPE GRANITE CURB
- – PROPOSED GUARDRAIL
- – PROPOSED POROUS PAVEMENT
- – PROPOSED CONCRETE
- – PROPOSED SIDEWALK

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

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CITY OF DOVER
PLANNING BOARD FILE#
P18–____

CIVILWORKS NEW ENGLAND
CIVIL ENGINEERING
181 Watson Road, P.O. Box 1166
Dover, New Hampshire 03820
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NO.	REVISION	APP'D	DATE

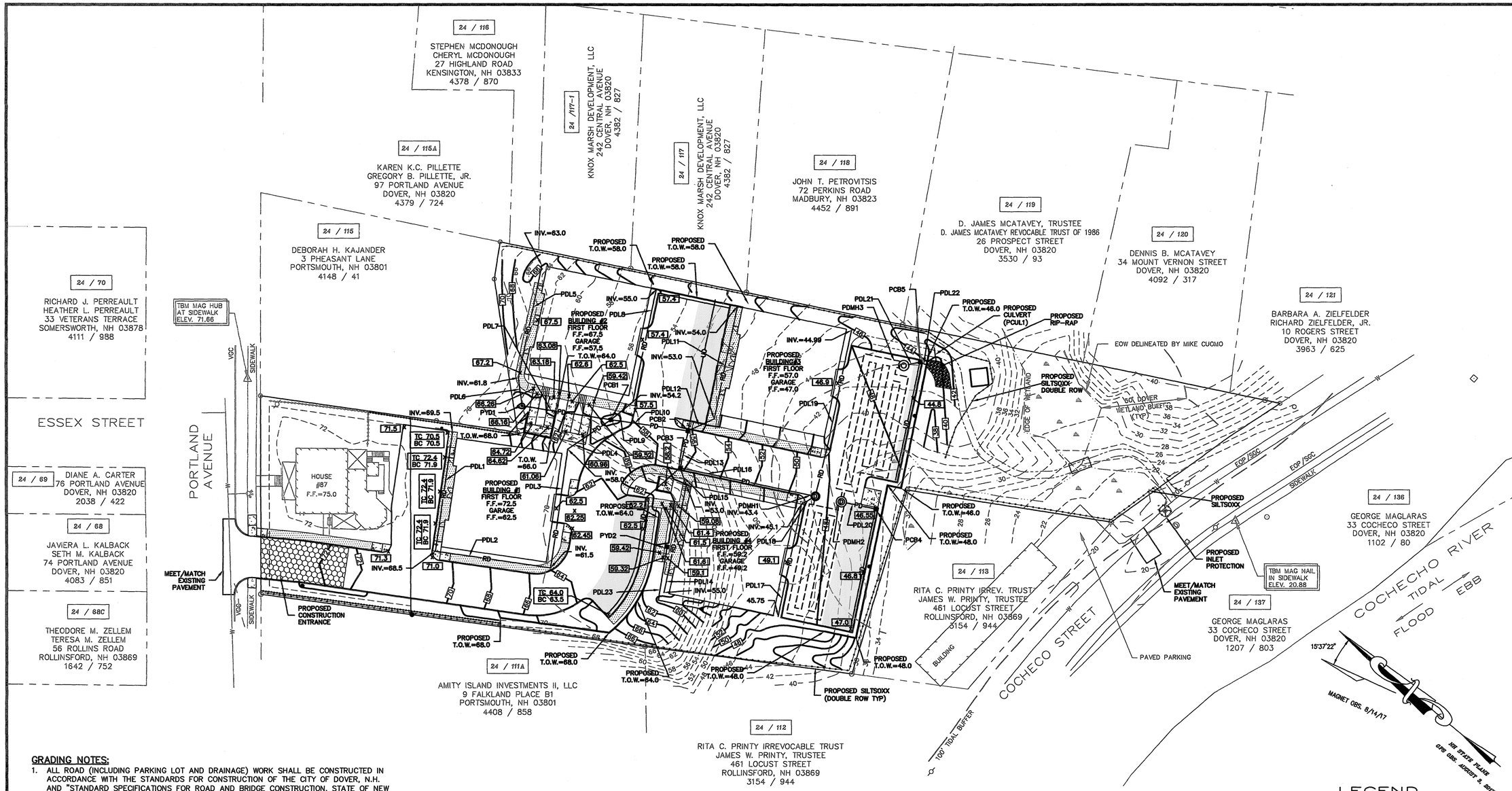
DATE: 7–18–18
SCALE: 1"=30'
DRAWN BY: SRD
DESIGN BY: MMR
APPROVED BY:S.H
PROJECT NO:1795
FILE: SITE.DWG

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

COCHECO LANDING
DOVER, NH

SITE PLAN

5



GRADING NOTES:

1. ALL ROAD (INCLUDING PARKING LOT AND DRAINAGE) WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARDS FOR CONSTRUCTION OF THE CITY OF DOVER, N.H. AND "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION", LATEST EDITION.
2. CONTRACTOR SHALL RETAIN A GEOTECHNICAL ENGINEERING CONSULTANT APPROVED BY THE OWNER, TO CONDUCT COMPACTION TESTING AND FILL GRADATION MONITORING PER THE ABOVE REFERENCED "STANDARD SPECIFICATIONS".
3. SEE EROSION CONTROL NOTES & DETAIL SHEET FOR TEMPORARY AND PERMANENT EROSION CONTROL MEASURES.
4. ALL DRAINAGE PIPES SHALL BE HDPE OR APPROVED EQUAL UNLESS OTHERWISE NOTED.
5. ALL DISTURBED AREAS NOT OTHERWISE CALLED FOR SURFACE TREATMENT SHALL RECEIVE 6" OF HIGH QUALITY LOAM AND SHALL BE SEEDED WITH GRASS.
6. ALL SITEWORK CONSTRUCTION SHALL BE ADVANCED USING "BEST MANAGEMENT PRACTICES" SANCTIONED BY THE USDA SCS AND NHDES.
7. TEMPORARY CONSTRUCTION ENTRANCE SHALL BE INSTALLED, UTILIZED AND MAINTAINED UNTIL BASE MATERIALS ARE CONSTRUCTED.
8. CONTRACTOR SHALL PROVIDE A FINISH GRADED SURFACE FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCE AND UNDER RAISED STRUCTURES.
9. DENSITY REQUIREMENTS:

LOCATION	MINIMUM DENSITY
BELOW PAVED OR CONCRETE AREAS TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL	95%
BELOW LOAM AND SEED AREA	90%

*ALL PERCENTAGES SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH AASHTO STANDARD 180, METHOD C. FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH AASHTO STANDARD T-191, T-204, OR T-238 AND T-239.

10. SEE GENERAL EROSION CONTROL NOTES ON DETAIL SHEET.
11. PROVIDE INLET PROTECTION BARRIERS AROUND ALL EXISTING AND PROPOSED STORM DRAINAGE INLETS WITHIN THE WORK LIMITS AND AS SHOWN ON PLAN. MAINTAIN FOR THE DURATION OF THE PROJECT UNTIL PAVEMENT HAS BEEN INSTALLED AND UPSTREAM AREAS HAVE BEEN STABILIZED.
12. INSPECT SILT BARRIERS AFTER EACH RAIN STORM OF 1/4 INCH OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 THE STRUCTURE HEIGHT.
13. A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IS REQUIRED FOR THIS PROJECT. THE SWPPP MUST INCLUDE THE APPROPRIATE BEST MANAGEMENT PRACTICES (BMP'S) TO MINIMIZE THE DISCHARGE OF POLLUTANTS FROM THE SITE. PARTIES RESPONSIBLE FOR DEVELOPING THE SWPPP SHOULD REFER TO THE EPA NPDES CONSTRUCTION GENERAL PERMITS NOTICE OF INTENT FOR A COMPLETE OUTLINE OR REQUIRED ELEMENTS. THESE PLANS AND THE STORMWATER MANAGEMENT SYSTEM INSPECTION & MAINTENANCE PLAN PREPARED FOR THIS PROJECT MAY BE UTILIZED IN FULFILLING THE REQUIREMENTS.
14. TREATMENT SWALES SHALL HAVE SOD BOTTOMS.

DRAINAGE SCHEDULE

PYD1
RIM=63.90
INV.IN=58.60
INV.OUT=58.50

PYD2
RIM=59.0 (V.I.F.)
INV.OUT=56.4

PCB1**
RIM=57.00
INV.IN=53.50
INV.OUT=53.15

PCB2**
RIM=56.25
INV.IN=52.00
INV.OUT=51.90

PCB3
RIM=56.25
INV.IN=51.70
INV.OUT=51.60

PCB4
RIM=46.55
INV.IN=43.75
INV.OUT=43.65

PCB5
RIM=44.40
INV.IN=38.35
INV.OUT=38.25

** WITH TREATMENT SYSTEM

PDMH1
RIM=48.60
INV.IN=44.50
INV.OUT=42.50

PDMH2 (DPI OUTLET)
RIM=47.55
(SEE DETAIL)

PDMH3 (DP2 OUTLET)
RIM=44.90
(SEE DETAIL)

PCUL1
INV.IN=40.0
INV.OUT=38.5

DRAINAGE PIPE SCHEDULE (ADS N12 PIPE)

PIPE	LENGTH	SIZE	SLOPE
PDL1	70'	8"	0.01
PDL2	68'	8"	0.10
PDL3	70'	8"	0.05
PDL4	28'	8"	0.16
PDL5	67'	6"	0.02
PDL6	17'	8"	0.19
PDL7	50'	12"	0.10
PDL8	67'	8"	0.01
PDL9	14'	8"	0.05
PDK10	41'	15"	0.03
PDL11	67'	8"	0.01
PDL12	15'	8"	0.07
PDL13	18'	15"	0.01
DPL14	64'	8"	0.03
PDL15	9'	8"	0.03
PDL16	76'	15"	0.09
PDL17	67	8"	0.008
PDL18	7'	8"	0.008
PDL19	97'	6"	0.005
PDL20	16'	12"	0.01
PDL21	10'	15"	0.01
PDL22	4'	15"	0.01
PDL23	40'	6"	0.01
PCUL1	10'	12"	0.01

LEGEND

PDL	PROPOSED DRAIN LINE
x 74.00	EXISTING SPOT GRADE
94	EXISTING GRADE
74	PROPOSED FINISH GRADE
x 74.00	PROPOSED SPOT GRADE
PD	PROPOSED DRAIN LINE
RD	PROPOSED ROOD DRAIN
	SILT BARRIER

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GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

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P18-___

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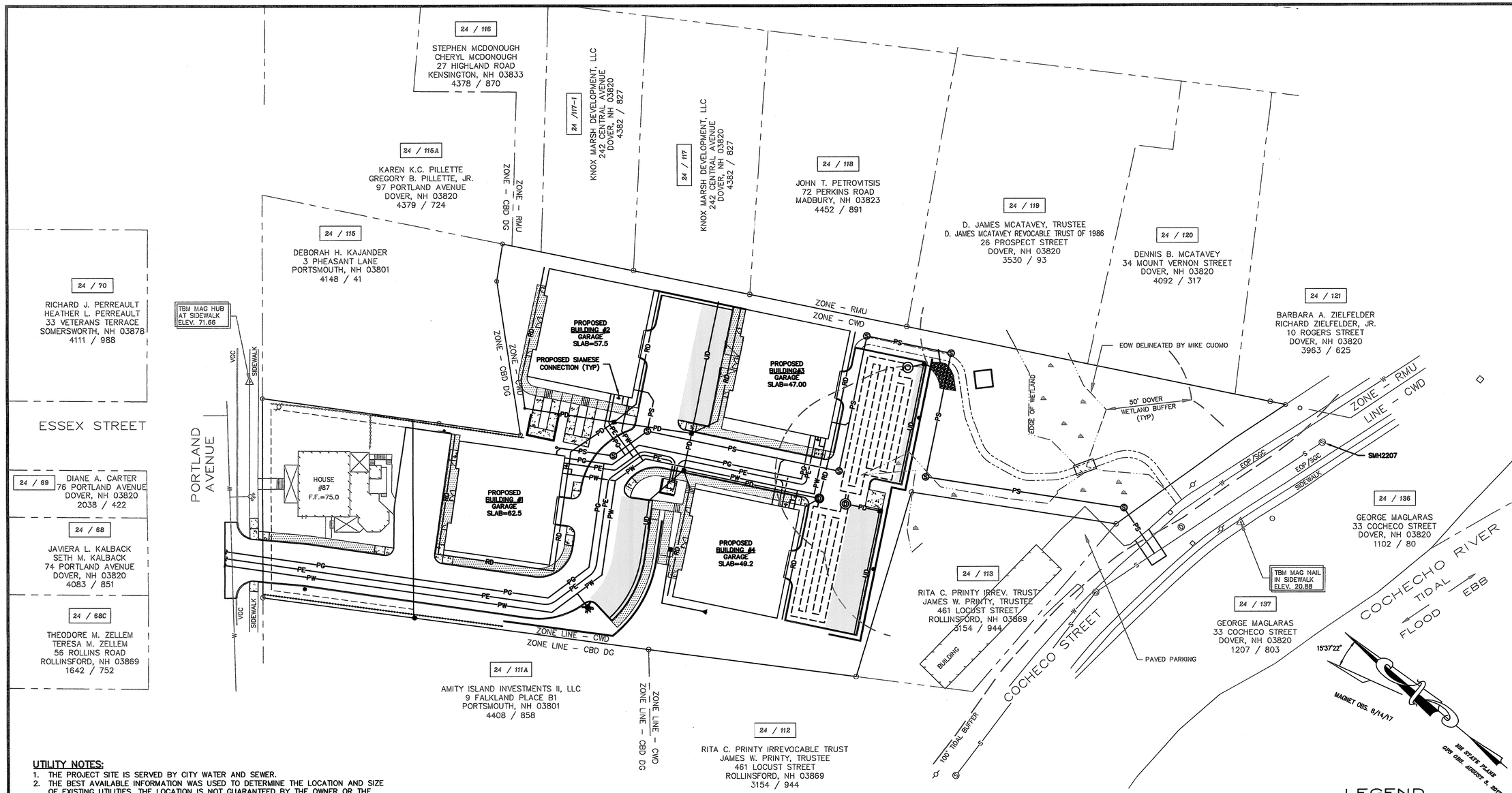
DATE: 7-18-18
SCALE: 1"=30'
DRAWN BY: SRD
DESIGN BY: MMR
APPROVED BY:S.H
PROJECT NO:1795
FILE: SITE.DWG

GRADING, DRAINAGE & EROSION CONTROL PLAN

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

COCHECO LANDING
DOVER, NH

6



UTILITY NOTES:

1. THE PROJECT SITE IS SERVED BY CITY WATER AND SEWER.
2. THE BEST AVAILABLE INFORMATION WAS USED TO DETERMINE THE LOCATION AND SIZE OF EXISTING UTILITIES. THE LOCATION IS NOT GUARANTEED BY THE OWNER OR THE ENGINEER. THE EXACT SIZE AND LOCATION OF UTILITIES SHALL BE CONFIRMED IN THE FIELD BY THE CONTRACTOR PRIOR TO COMMENCING WORK. IT IS ALSO THE CONTRACTOR'S RESPONSIBILITY TO ANTICIPATE CONFLICTS AND REPAIR EXISTING UTILITIES AS NECESSARY TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
3. ALL EXISTING UTILITY LOCATIONS ARE APPROXIMATE AS SHOWN. THE CONTRACTOR SHALL VERIFY THEIR EXACT LOCATIONS WITH THE RESPECTIVE UTILITY OWNERS PRIOR TO WORK BEING PERFORMED. CALL DIGSAFE AT 1–888–388–7233 OR "811".
4. ALL PROPOSED UTILITY SERVICES SHALL BE UNDERGROUND WITHIN THE SITE.
5. UNDERGROUND ELECTRIC, TELEPHONE, AND CABLE TV CONDUITS SHALL BE INSTALLED IN ACCORDANCE WITH/PER PSNH, VERIZON, COMCAST, AND UNITIL STANDARDS.
6. PROPOSED INSTALLATION OF UNDERGROUND CONDUITS FOR TELEPHONE, ELECTRIC AND GAS SERVICE SHALL BE COORDINATED WITH THE RESPECTIVE CONTACTS ARE AS FOLLOWS:
   - ELECTRIC: EVERSOURCE 800.362.7764
   - CABLE: COMCAST 603.334.3615
   - NATURAL GAS: UNITIL 866.933.3821
   - WATER/SEWER: CITY OF DOVER 603.516.6450
7. SEE ELECTRICAL DRAWINGS AND DETAILS FOR OUTDOOR LIGHTING CONDUIT LOCATIONS.
8. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
9. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
10. SEWAGE LOADING (PER ENV. – Wq 1008.03 TABLE 1008–1)
    32 – 2 BEDROOM RESIDENTIAL APARTMENTS =
    2 BDRMS x 150 GALS./DAY/BDRM x 32 = 9,600 GPD
11. THE PROPOSED STRUCTURES SHALL BE SERVED BY A SPRINKLER SYSTEM AS REQUIRED UNDER CHAPTER 109–30 OF THE CODE OF THE CITY OF DOVER AND THE 2009 STATE BUILDING CODE.
12. SPRINKLER CONNECTIONS MUST BE FLUSHED IN ACCORDANCE WITH NFPA 24 AND A CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR UNDERGROUND PIPING FORM MUST BE COMPLETED.
13. FIRE DEPARTMENT CONNECTIONS SHALL BE LOCATED ON THE STREET SIDE OF THE BUILDING PER NFPA 13.
14. A SECURITY SYSTEM SHALL BE INSTALLED AS REQUIRED BY CHAPTER 58, ARTICLE I, SECTION 58–2 OF THE CODE OF THE CITY OF DOVER.
15. ALL ON–SITE UTILITIES SHALL BE INSTALLED UNDERGROUND.
16. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO APPLICABLE CITY AND STATE CODES.
17. BACKFLOW PREVENTORS SHALL BE INSTALLED ON BOTH FIRE AND DOMESTIC WATER LINES.
18. ALL UNUSED WATER SERVICES SHALL BE REMOVED BACK TO THE CORPORATION AT THE MAIN.

SEWER STRUCTURE SCHEDULE:

PSMH1	PSMH4*	PSMH6*	TIE IN (COCHECO)
RIM=60.2	RIM=±46	RIM=±33.0	INV.IN=±9.05
INV.OUT=53.9	INV.IN=40.1	INV.IN=28.00	
	INV.OUT=40.0	INV.OUT=24.62	SMH #2206
PSMH2		(DROP=3.38)	RIM=19.62
RIM=57.93	PSMH5*		DEPTH=10.7
INV.IN=51.95	RIM=±42	PSMH7*	INV=±8.92
INV.OUT=51.85	INV.IN=36.00	RIM=±20.3	
	INV.OUT=33.86	INV.IN=15.3	SMH #2207
PSMH3	(DROP=2.14)	INV.OUT=11.21	RIM=21.79
RIM=47.83		(DROP=4.09)	DEPTH=12.3
INV.IN=42.84			INV=±9.49
INV.OUT=42.74			

* SMH RIMS SHALL BE SET 6" ABOVE GRADE
* ALL DROP SHALL BE EXTERIOR DROPS

SEWER PIPE SCHEDULE:

PSP1 21 LF	PSP5 70 LF
8" SDR35 PVC	8" SDR35 PVC
S=0.08	S=0.08
PSP2 110'	PSP6 113 LF
8" SDR35 PVC	8" SDR35 PVC
S=0.08	S=0.08
PSP3 76 LF	PSP7 25 LF
8" SDR35 PVC	8" SDR35 PVC
S=0.033	S=0.08
PSP4 46 LF	PSP8 32 LF
8" SDR35 PVC	8" SRD35 PVC
S=0.08	S=0.067

LEGEND

W	EXISTING WATER LINE
S	EXISTING SEWER LINE
D	EXISTING DRAINAGE LINE
G	EXISTING GAS LINE
	EXISTING WATER SHUT–OFF
WV	EXISTING WATER VALVE
GV	EXISTING GAS VALVE
	EXISTING HYDRANT
	SIGN
PG	PROPOSED GAS
PW	PROPOSED WATER
PE	PROPOSED ELECTRIC
PD	PROPOSED UNDERDRAIN LINE
RD	PROPOSED ROOF DRAIN
PSMH	PROPOSED SEWER MANHOLE
PSP	PROPOSED SEWER PIPE
V.I.F.	VERIFY IN FIELD

MON (TBS) O	– BOUNDARY MONUMENT (TO BE SET)
S.C.R.D.	– STRAFFORD COUNTY REGISTRY OF DEEDS
S.C.R.P.	– STRAFFORD COUNTY REGISTRY OF PROBATE
S.F.	– SQUARE FEET
Ac.	– ACRE
(TYP.)	– TYPICAL
ø	– DIAMETER
UP	– UTILITY POLE
OHU	– OVERHEAD UTILITY LINES
VGC	– VERTICAL GRANITE CURB
CB	– CATCH BASIN
DMH	– DRAIN MANHOLE
SMH	– SEWER MANHOLE
	– WETLANDS
	– EDGE OF WETLAND
WF2 / A6	– WETLAND FLAG I.D.
	TBR TO BE REMOVED

GRAPHIC SCALE

30 0 15 30 60 120
(IN FEET)

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CITY OF DOVER
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P18–____

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NO.	REVISION	APP'D	DATE

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UTILITY PLAN

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

COCHECO LANDING
DOVER, NH

7



NOTES:

1. THE SUBJECT PARCELS ARE NOT LOCATED WITHIN THE 0.2 PERCENT ANNUAL CHANCE FLOODPLAIN AS SHOWN ON FLOOD INSURANCE RATE MAP COMMUNITY NUMBER 330145; PANEL 0330; SUFFIX E; MAP NUMBER 33017C0330E; EFFECTIVE DATE SEPT. 30, 2015.
2. BASIS OF BEARING IS NH STATE PLANE (NAD83) BASED ON GPS OBSERVATION DATED AUGUST 3, 2017.
   VERTICAL DATUM IS NH STATE PLANE (NAD83) BASED ON GPS OBSERVATION DATED AUGUST 3, 2017.
3. PROPERTY LINE INFORMATION HAS BEEN OBTAINED FROM A SURVEY PERFORMED BY MCENEANEY SURVEY ASSOCIATES, INC. ON DECEMBER 18, 2017 WITH AN ERROR NOT GREATER THAN 1 IN 10,000.
4. PARCEL IS SUBJECT TO THE STATE OF NEW HAMPSHIRE SHORELINE WATER QUALITY PROTECTION ACT (SWQPA). THOSE AREAS WITHIN 250 FEET OF THE COCHECHO RIVER REFERENCE LINE.
5. WETLANDS WERE DELINEATED ON NOVEMBER 30, 2017 BY MICHAEL CUOMO, CERTIFIED WETLANDS SCIENTIST #004 AND FIELD LOCATED BY THIS OFFICE ON DECEMBER 15, 2017.
6. THE ABUTTERS PAVED PARKING AREA APPEARS TO ENCROACH ONTO PARCEL 24 / 115B (TWO PLACES, TWO ABUTTERS).
7. PARCEL 24 / 115B IS BENEFITED BY A TWENTY–TWO (22) FOOT WIDE RIGHT OF WAY OVER PARCEL 24 / 115 AS SHOWN ON REFERENCE PLAN No. 1. REFERENCE IS MADE TO STIPULATIONS SPELLED OUT IN S.C.R.D. VOL. 1157, PAGE 648 REGARDING USE OF THIS RIGHT OF WAY.

IMPACT CHART

	PERMANENT IMPACT AREA A	= 170 SF
	TEMPORARY IMPACT AREA A	= 131 SF
	PERMANENT IMPACT AREA B	= 11 SF
	TEMPORARY IMPACT AREA B	= 458 SF
	50' BUFFER IMPACT	= 11,017 SF
	20% SLOPE IMPACT	= 9,950 SF
	TIDAL BUFFER 100' IMPACT	= 150 SF

REFERENCE PLANS:

1. TOPOGRAPHIC PLAN OF LAND, PREPARED FOR: MICHAEL J. SPINELLI, JR.; TAX MAP 24, LOT NO. 114; 87 PORTLAND AVENUE AND DEAN STREET HOLDINGS, INC; TAX MAP 21, LOT NO. 115B; COCHECHO STREET, CITY OF DOVER; COUNTY OF STRAFFORD; STATE OF NEW HAMPSHIRE; PREPARED BY MCENEANEY SURVEY ASSOCIATES, INC; SCALE 1"=30'; DATED; 12–26–17.
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GRAPHIC SCALE

30 0 15 30 60 120

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WETLAND & BUFFER IMPACT PLAN

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

COCHECO LANDING
DOVER, NH

8

DESCRIPTION

THE INTENT OF THIS PLAN IS TO SHOW SITE IMPROVEMENTS ASSOCIATED WITH THE CONSTRUCTION OF 4 – 5 STORY APARTMENT BUILDINGS. EACH BUILDING WILL HAVE A PARKING GARAGE BENEATH AND FOUR FLOORS OF APARTMENTS ABOVE, SURFACE PARKING FOR EACH BUILDING AND A WALKING PATH TO COCHECO STREET.

PROJECT NAME AND LOCATION

COCHECO LANDING — LATITUDE N43°11'57"
PORTLAND AVENUE — LONGITUDE W70°52'08"
DOVER, NH 03820

DISTURBED AREA

±63,436 square feet

SEQUENCE OF MAJOR ACTIVITIES

1. CONTRACTOR SHALL PREPARE THE SWPPP, FILE FOR AND OBTAIN THE NOI A MINIMUM OF 2 WEEKS PRIOR TO COMMENCEMENT OF SITE WORK.
2. PLACE TEMPORARY EROSION AND SEDIMENT CONTROL BMP'S PRIOR TO EARTH MOVING ACTIVITIES. ALL EROSION CONTROL AND PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO COMMENCING EARTH MOVING OPERATIONS.
3. SELECTIVE DEMOLITION.
4. REGRADE SITE TO SUBGRADE
5. INSTALL DRAINAGE STRUCTURES AND CONTROLS
6. INSTALL UNDERGROUND UTILITIES AND FOUNDATIONS FOR STRUCTURES AND RETAINING WALLS.
7. PLACE GRAVELS AND FINE GRADE
8. SWALES AND PONDS (AS APPLICABLE) SHALL BE CONSTRUCTED EARLY ON IN THE CONSTRUCTION SEQUENCE AND BEFORE ROUGH GRADING OF THE SITE AND ALL DITCHED AND SWALES SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
9. STABILIZE, ROADWAYS & PARKING LOTS WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
10. ALL CUT AND FILL SLOPES SHALL BE LOAMED AND SEEDED (AS APPLICABLE) WITHIN 72 HOURS OF ACHIEVING FINISH GRADE.
11. ALL EROSION CONTROL MEASURES SHALL BE INSPECTED AT LEAST WEEKLY AND AFTER EVERY 1/4" OF RAINFALL.
12. IN ALL CASES THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION AND IN NO CASE SHALL EXCEED 2 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED. ALL DISTURBED AREAS SHALL BE STABILIZED WITHIN 14 DAYS OF INITIAL DISTURBANCE.
13. WHEN ALL SITE WORK IS COMPLETE AND ALL DISTURBED AREAS ARE STABILIZED REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AND FILE THE EPA – N.O.T.

DEFINITIONS

AN AREA SHALL BE CONSIDERED STABLE OF ONE OF THE FOLLOWING HAS OCCURRED.
1. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED
2. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED
3. A MINIMUM OF 3" OF NON–EROSIVE MATERIAL SUCH AS STONE OR RIP–RAP HAS BEEN INSTALLED; OR
4. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES OF EROSION AND SEDIMENT CONTROLS

A. GENERAL

THESE ARE THE GENERAL INSPECTION AND MAINTENANCE PRACTICES THAT WILL BE USED TO IMPLEMENT THE PLAN.

- ALL DITCHES AND SWALES SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
- THE SMALLEST PRACTICAL PORTION OF THE SITE WILL BE DENUDED AT ONE TIME.
- ALL CONTROL MEASURES WILL BE INSPECTED AT LEAST ONCE EACH WEEK AND FOLLOWING ANY STORM EVENT OF 1/2 INCH OR GREATER.
- ALL MEASURES WILL BE MAINTAINED IN GOOD WORKING ORDER; IF A REPAIR IS NECESSARY, IT WILL BE INITIATED WITHIN 24 HOURS OF REPORT.
- BUILT UP SEDIMENT WILL BE REMOVED FROM SILT FENCE OR CHECK DAMS WHEN IT HAS REACHED ONE THIRD THE HEIGHT OF THE FENCE OR DAM.
- ALL DIVERSION DIKES WILL BE INSPECTED AND ANY BREACHES PROMPTLY REPAIRED.
- TEMPORARY SEEDING AND PLANTING WILL BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND UNHEALTHY GROWTH.
- A MAINTENANCE INSPECTION REPORT WILL BE MADE AFTER EACH INSPECTION.
- A REPRESENTATIVE OF THE OWNER, WILL BE RESPONSIBLE FOR INSPECTIONS, MAINTENANCE AND REPAIR ACTIVITIES, AND FILLING OUT THE INSPECTION AND MAINTENANCE REPORT.
- ALL AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISH GRADE

B. FILTERS

1. Silt Fence
   a. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

Physical Property	Test	Requirements
Filtering Efficiency	VTM–51	75% minimum
Tensile Strength at 20% Maximum Elongation*	VTM–52	Extra Strength 50 lb/lin in (min)
Standard Strength 30 lb/lin in (min)		
Flow Rate	VTM–51	0.3 gal/sf/min (min)

* Requirements reduced by 50 percent after six (6) months of installation.

   Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six (6) months of expected usable construction life at a temperature range of 0 degrees F to 120 Degrees F.

   b. The height of a silt fence shall not exceed thirty–six (36) inches.
   c. The filter fabric shall be purchased in a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are necessary, filter cloth shall be spliced together only at support post, with a minimum six (6) inch overlap, and securely sealed.
   d. Posts shall be spaced a maximum of ten (10) feet apart at the barrier location and driven securely into the ground (minimum of 12 inches). When extra strength fabric is used without the wire support fence, post spacing shall not exceed 6 feet.
   e. Posts for silt fences shall be 2–inch diameter wood with a minimum length of 5 feet.
   f. Wire fence reinforcement for silt fences using standard strength filter cloth shall be a minimum of 42 inches in height, a minimum of 14 gauge and shall have a maximum mesh spacing of 6 inches.
   g. A trench shall be excavated approximately four (4) inches wide and four (4) inches deep along the line of posts and upslope from the barrier.
   h. When standard strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least one (1) inch long, tie wires or hog rings. The wire shall extend no more than 36 inches above the original ground surfaces.
   i. The "standard strength" filter fabric shall be stapled or wired to the fence, and eight (8) inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.
   j. When extra strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of item (i) applying.
   k. The trench shall be backfilled and the soil compacted over the filter fabric.
   l. Silt fences shall be removed when they have served their useful purpose, but not before the upslope areas has been permanently stabilized.

2. Sequence of Installation
   Sediment barriers shall be installed prior to any soil disturbance of the contributing drainage area above them.
3. Maintenance

   a. Check dams and silt fence barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired if there are any signs of erosion or sedimentation below them. Any required repairs shall be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water behind them, sediment barriers shall be replaced with a temporary check dam.
   b. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.
   c. Sediment deposits should be removed after each storm event. They must be removed when deposits reach approximately one third (1/3) the height of the barrier.
   d. Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform with the existing grade, prepared and seeded.

C. MULCHING

1. Timing
   In order for mulch to be effective, it must be in place prior to major storm events. There are two (2) types of standards which shall be used to assure this.
   a. Apply mulch prior to any storm event. It will be necessary to closely monitor weather predictions, usually by contacting the National Weather Service in Concord, to have adequate warning of significant storms.
   b. Required Mulching within a specified time period. The time period can range from 14 to 21 days of inactivity on a area, the length of time varying with site conditions. Professional judgement shall be used to evaluate the interaction of site conditions (soil erodibility, season of year, extent of disturbance, proximity to sensitive resources, etc.) and the potential impact of erosion on adjacent areas to choose an appropriate time restriction.
2. Application Rate
   Mulch shall be applied at a rate of between 1.5 to 2 tons per acre, or 90 to 100 pounds per 1000 square feet.
3. Guidelines for Winter Mulch Application. When mulch is applied to provide protection over winter (past the growing season) it shall be at a rate of 6,000 pounds of hay or straw per acre. A tackifier may be added to the mulch.
4. Maintenance All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by mulch, additional mulch shall be immediately applied.
5. Excelsior Matting Excelsior Matting shall be used in place of mulch on all slopes steeper than 3:1.

D. TEMPORARY GRASS COVER

1. Seedbed Preparation
   Apply fertilizer at the rate of 600 pounds per acre of 10–10–10. Apply limestone (equivalent to 50 percent calcium plus magnesium oxide) at a rate of three (3) tons per acre.
2. Seeding
   a. Utilize annual rye grass at a rate of 40 lbs/acre.
   b. Where the soil has been compacted by construction operations, loosen soil to a depth of two (2) inches before applying fertilizer, lime and seed.
   c. Apply seed uniformly by hand, cyclone seeder, or hydroseeder (slurry including seed and fertilizer). Hydroseedings, which include mulch, may be left on soil surface. Seeding rates must be increased 10% when hydroseeding.
3. Maintenance
   Temporary seedings shall be periodically inspected. At a minimum, 95% of the soil surface should be covered by vegetation. If any evidence of erosion or sedimentation is apparent, repairs shall be made and other temporary measures used in the interim (mulch, filter barriers, check dams, etc.).

E. PERMANENT SEEDING

1. Bedding – stones larger than 1 ½ ", trash, roots, and other debris interfere with seeding and future maintenance of the area should be removed. Where feasible, the soil should be tilled to a depth of 4" to prepare a seedbed and mix fertilizer into the soil.
2. Fertilizer – lime and fertilizer should be applied evenly over the area prior to or at the time of seeding and incorporated into the soil. Kinds and amounts of lime and fertilizer should be based on an evaluation of soil tests. When a soil test is not available, the following minimum amounts should be applied:

   Agricultural Limestone @ 100 lbs. per 1,000 s.f.
   10–20–20 fertilizer @ 12 lbs. per 1,000 s.f.
3. Seed Mixture (recommended)

   Rate:

Type	LBS. per Acre	LBS. per 1,000 s.f.
Tall Fescue	20	0.45
Creeping Red Fescue	20	0.45
Birdsfoot Trefoil	8	0.20
Total	48	1.10

4. Sodding – sodding is done where it is desirable to rapidly establish cover on a disturbed area. Sodding an area may be substituted for permanent seeding procedures anywhere on site. Bed preparation, fertilizing, and placement of sod shall be performed according to the S.C.S. Handbook.

   Sodding is recommended for steep sloped areas, areas immediately adjacent to sensitive water courses, easily erodible soils (fine sand/silt) etc.
5. Provide a minimum of 4 inches (5 inches loose) of topsoil to all areas to be seeded.

F. STORM DRAIN INLET PROTECTION

1. Straw/Hay Bale Inlet Structure
   a. Bales shall be either wire bound or string tied with the bindings oriented around the sides rather than over and under the bales.
   b. Bales shall be placed lengthwise in a single row surrounding the inlet, with the ends of adjacent bales pressed together.
   c. The filter barrier shall be entrenched and backfilled. A trench shall be excavated around the inlet the width of bale to a minimum depth of four (4) inches. After the bales are staked, the excavated soil shall be backfilled and compacted against the filter barrier.
   d. Each bale shall be securely anchored and held in place by at least two (2) stakes or rebars driven through the bale.
   e. Loose straw/hay shall be wedged between bales to prevent water from entering between bales.
   f. All structures should be inspected after every rainstorm and repairs made as necessary.
   g. Sediment should be removed from the devices after the sediment has reached a maximum of one–third the depth of the trap.
   h. Haybales should be removed and the area repaired as soon as the contributing drainage area to the inlet has been completely stabilized.

TIMING OF CONTROLS/MEASURES

As indicated in the sequence of Major Activities the silt fences shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Areas where construction activity temporarily ceases for more than twenty one (21) days will be stabilized with a temporary seed and mulch within fourteen (14) days of the last disturbance. Once construction activity ceases permanently in an area, silt fences and any earth/dikes will be removed once permanent measures are established. All areas shall be stabilized within 72 hours of achieving finish grade.

WASTE DISPOSAL

A. WASTE MATERIALS
All waste materials will be collected and stored in securely lidded receptacles. All trash and construction debris from the site will be deposited in a dumpster. No construction waste materials will be buried on site. All personnel will be instructed regarding the correct procedure for waste disposal by the superintendent.

B. HAZARDOUS WASTE
All hazardous waste materials will be disposed of in the manner specified by local or state regulation or by the manufacturer. Site personnel will be instructed in these practices by the superintendent.

C. SANITARY WASTE
All sanitary waste will be collected from the portable units a minimum of once per week by a licensed sanitary waste management contractor.

SPILL PREVENTION

A. MATERIAL MANAGEMENT PRACTICES

The following are the material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances during construction to stormwater runoff:

Good Housekeeping:

The following good housekeeping practices will be followed on site during the construction project:

- An effort will be made to store only sufficient amounts of products to do the job.
- All materials stored on site will be stored in a neat, orderly manner in their proper (original if possible) containers and, if possible, under a roof or other enclosure.
- Manufacturer's recommendations for proper use and disposal will be followed.
- The site superintendent will inspect daily to ensure proper use and disposal of materials.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible all of a product will be used up before disposing of the container.

Hazardous Products:

The following practices will be used to reduce the risks associated with hazardous materials:

- Products will be kept in their original containers unless they are not resealable.
- Original labels and material safety data will be retained for important product information.
- Surplus product that must be disposed of will be discarded according to the manufacturer's recommended methods of disposal.

B. PRODUCT SPECIFICATION PRACTICES
The following product specific practices will be followed on site:

Petroleum Products:

All on site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Any asphalt based substances used on site will be applied according to the manufacturer's recommendations.

Fertilizers:

Fertilizers used will be applied only in the minimum amounts directed by the specifications. Once applied fertilizer will be worked into the soil to limit exposure to stormwater. Storage will be in a covered shed or enclosed trailers. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid

Paints:

spills.
All containers will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the storm sewer system but will be disposed of properly according to manufacturer's instructions or state and local regulations.

Concrete Trucks:

Concrete trucks will discharge and wash out surplus concrete or drum wash water in a contained area on site.

C. SPILL CONTROL PRACTICES

In addition to good housekeeping and material management practices discussed in the previous section the following practices will be followed for spill prevention and cleanup:

- Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area on site. Equipment and materials will include but not be limited to brooms, dustpans, mops, rags, gloves, goggles, kitty litter, sand, sawdust and plastic or metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- Spills of toxic or hazardous material will be reported to the appropriate state or local government agency, regardless of the size.
- The spill prevention plan will be adjusted to include measures to prevent this type of spill from recurring and how to cleanup the spill if it recurs. A description of the spill, its cause, and the cleanup measures will be included.
- The site superintendent responsible for day–to–day site operations will be the spill prevention and cleanup coordinator.

BLASTING

1) All activities associated with blasting need to be optimized to prevent the release of chemicals associated with blasting activities to the environment.
2) Identify drinking water wells located within 2000 feet of the proposed blasting activities. Develop a groundwater quality sampling program to monitor for nitrate and nitrite either in the drinking water supply wells or in other wells that are representative of the drinking water supply wells in the area. The plan must include pre and post blast water quality monitoring and be approved by NHDES prior to initiating blasting. The groundwater sampling program must be implemented once approved by NHDES.
3) The following Best Management Procedures for blasting shall be complied with:
   (1) Loading practices. The following blasthole loading practices to minimize environmental effects shall be followed:
      (a) Drilling logs shall be maintained by the driller and communicated directly to the blaster. The logs shall indicate depths and lengths of voids, cavities, and fault zones or other weak zones encountered as well as groundwater conditions.
      (b) Explosive products shall be managed on–site so that they are either used in the borehole, returned to the delivery vehicle, or placed in secure containers for off–site disposal.
      (c) Spillage around the borehole shall either be placed in the borehole or cleaned up and returned to an appropriate vehicle for handling or placement in secured containers for off–site disposal.
      (d) Loaded explosives shall be detonated as soon as possible and shall not be left in the blastholes overnight, unless weather or other safety concerns reasonably dictate that detonation should be postponed.
      (e) Loading equipment shall be cleaned in an area where wastewater can be properly contained and handled in a manner that prevents release of contaminants to the environment.
      (f) Explosives shall be loaded to maintain good continuity in the column load to promote complete detonation. Industry accepted loading practices for priming, stemming, decking and column rise need to be attended to.
   (2) Explosive Selection. The following BMPs shall be followed to reduce the potential for groundwater contamination when explosives are used:
      (a) Explosive products shall be selected that are appropriate for site conditions and safe blast execution.
      (b) Explosive products shall be selected that have the appropriate water resistance for the site conditions present to minimize the potential for hazardous effect of the product upon groundwater.
   (3) Prevention of Misfires. Appropriate practices shall be developed and implemented to prevent misfires.
   (4) Muck Pile Management. Muck piles (the blasted pieces of rock) and rock piles shall be managed in a manner to reduce the potential for contamination by implementing the following measures:
      (a) Remove the muck pile from the blast area as soon as reasonably possible.
      (b) Manage the interaction of blasted rock piles and stormwater to prevent contamination of water supply wells or surface water.
   (5) Spill Prevention Measures and Spill Mitigation. Spill prevention and spill mitigation measures shall be implemented to prevent the release of fuel and other related substances to the environment. The measures shall include at a minimum:
      (a) The fuel storage requirements shall include:
         1. Storage of regulated substances on an impervious surface;
         2. Secure storage areas against unauthorized entry;
         3. Label regulated containers clearly and visibly;
         4. Inspect storage area weekly;
         5. Cover regulated containers in outside storage areas;
         6. Wherever possible, keep regulated containers that are stored outside more than 50 feet from surface water and storm drains, 75 feet from private wells, and 400 feet from public wells; and
         7. Secondary containment is required for containers containing regulated substances stored outside, except for on premise use heating fuel tanks, or aboveground or underground storage tanks otherwise regulated.
      (b) The fuel handling requirements shall include:
         1. Except when in use, keep containers containing regulated substances closed and sealed;
         2. Place drip pans under spigots, valves, and pumps;
         3. Have spill control and containment equipment readily available in all work areas;
         4. Use funnels and drip pans when transferring regulated substances; and
         5. Perform transfers of regulated substances over an impervious surface.
      (c) The training of on–site employees and the on–site posting of release response information describing what to do in the event of a spill of regulated substances.
      (d) Fueling and maintenance of excavation, earthmoving and other construction related equipment will comply with the regulations of the New Hampshire Department of Environmental Services [note these requirements are summarized in WD–DWGB–22–6 Best Management Practices for Fueling and Maintenance of Excavation and Earthmoving Equipment" or its successor document. (see http: //des.nh.gov/organization/commissioner/pip/factsheets/dwgb/documents/dwgb–22–6.pdf>

PER 149–10 F:
All site improvements which require blasting of land shall meet the following requirements prior to any blasting occurring.

1. The Applicant shall prepare a pre–blast survey of all structures within five (500) feet of the external boundaries of the proposed lot to be developed. This survey, along with a monitoring plan, shall be on file with the Dover Fire and Rescue. Upon recommendations of the Chief , the planning Board may require a pre–blast survey of all structures within one thousand (1000) feet.
2. The Applicant shall hold a neighborhood meeting to review the blasting plan and pre–blast survey, with representatives of the Fire and Rescue and the blasting company in attendance, prior to any on–site blasting. Abutters within on thousand (1000) feet of the external boundary of the project parcel shall be notified by certified mail (paid for by the applicant) of the meeting no less than ten (10) days prior to the meeting.
3. Permit holders shall be in compliance with NFPA 495, The Code for the Manufacture, Transportation, Storage and Use of Explosive Material, in addition to all other ordinances and codes set forth in the City of Dover Fire Prevention Code, which specifically prohibits the overnight storage of explosive or blasting agents. Further all storage magazines shall be locked in the open position at the end of the days' operation, for easy inspection by City Officials.
4. blasting permits may be obtained by calling the Dover Fire and Rescue during normal business hours. The permits are only active for the dates and time specified on the permit.
5. Permit holders shall hold insurance against claims for damages for personal injury and property which may arise from performance of the work.
6. Hours of operation for the blasting shall be no earlier than 8:00 am and no later than 6:00 pm Monday through Friday, excluding federal holidays.

MAINTENANCE OF STORMWATER MANAGEMENT FACILITIES

The project proponent is responsible for the maintenance of all stormwater facilities during construction and the property owner is responsible after construction is complete.

CATCH BASINS & STORMWATER TREATMENT STRUCTURES

1. Catch basins & Stormwater treatment structures should be inspected on a monthly basis and/or after a major rainfall event to assure that debris or sediments do not reduce the effectiveness of the system.

WINTER CONSTRUCTION NOTES

1. All proposed post–development vegetated areas which do not exhibit a minimum of 85 % vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting, elsewhere. The placement of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt.
2. All slopes which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th shall be stabilized with stone or erosion control blankets.
3. After October 15th, incomplete road surfaces shall be protected with a minimum of 3–inches of crushed gravel per NHDOT Item 403.3, or if construction is to continue through the winter season be cleared of any accumulated snow after each storm event.

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

CITY OF DOVER
PLANNING BOARD FILE#
P18–____

CIVILWORKS NEW ENGLAND
CIVIL ENGINEERING
181 Watson Road, P.O. Box 1166
Dover, New Hampshire 03820
(603) 743–0443

NO.	REVISION	APP'D	DATE

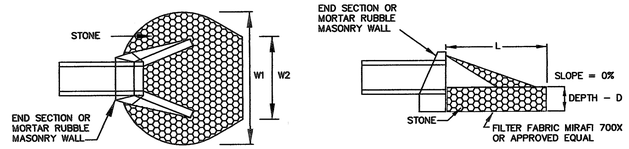
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DRAWN BY: SRD
DESIGN BY: MMR
APPROVED BY:S.H
PROJECT NO:1795
FILE: SITE.DWG

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

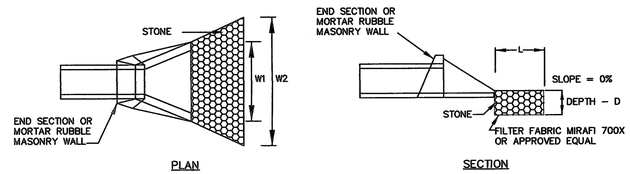
COCHECO LANDING
DOVER, NH

EROSION CONTROL NOTES

9



STONE APRON OUTLET PROTECTION DETAIL
OUTLET TO DEFINED CHANNEL



STONE APRON OUTLET PROTECTION DETAIL
OUTLET TO FLAT AREA, NON DEFINED CHANNEL

MAINTENANCE

THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR STORM. IF THE RIPRAP HAS BEEN DISPLACED, UNDERMINED OR DAMAGED, IT SHOULD BE REPAIRED IMMEDIATELY. THE CHANNEL IMMEDIATELY BELOW THE OUTLET SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO THE OUTLET PROTECTION APRON.

STONE GRADATION

% OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE
100	1.5 TO 2.0 D50
85	1.3 TO 1.8 D50
50	1.0 TO 1.5 D50
15	0.3 TO 0.5 D50

CONSTRUCTION SPECIFICATIONS

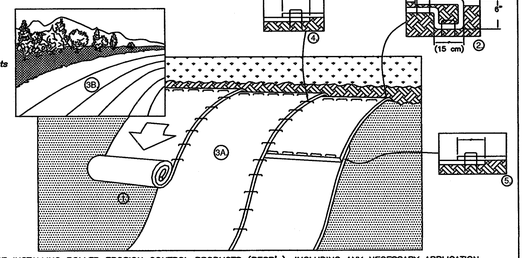
1. THE SUBGRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIPRAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE ROCK OR GRAVEL USED FOR FILTER OR RIPRAP SHALL CONFORM TO THE SPECIFIED GRADATION.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIPRAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

RIP RAP OUTLET PROTECTION
NOT TO SCALE

OUTLET FROM	OUTLET TO	W1(ft)	W2(ft)	L(ft)	D (ft)	D50(IN)	CHANNEL TYPE
PCB5	TS 1	3	8	14	0.06	USE 6" MIN.	DEFINED

SLOPE INSTALLATION
NORTH AMERICAN GREEN – SC150

NORTH AMERICAN GREEN
EROSION CONTROL *Products Guaranteed* SOLUTIONS



1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
   NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
3. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM™ STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" – 5" (5 CM – 12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH.
   NOTE:
   *IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.
6. TO BE PLACED ON ALL SLOPES.

SILTSACK®
SPECIFICATIONS

NOTE: THE SILTSACK WILL BE MANUFACTURED FROM A WOVEN POLYPROPYLENE FABRIC THAT MEETS OR EXCEEDS THE FOLLOWING SPECIFICATIONS. AS SUPPLIED BY AH HARRIS OF PORTSMOUTH OR APPROVED EQUAL

REGULAR FLOW SILTSACK®

(FOR AREAS OF LOW TO MODERATE PRECIPITATION AND RUN-OFF)

PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	300 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	120 LBS
MULLEN BURST	ASTM D-3786	600 PSI
TRAPEZOID TEAR	ASTM D-4533	120 LBS
UV RESISTANCE	ASTM D-4355	80 %
APPARENT OPENING SIZE	ASTM D-4751	40 US SIEVE
FLOW RATE	ASTM D-4491	40 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	0.50 SEC -1

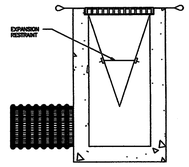
HI-FLOW SILTSACK®

(FOR AREAS OF MODERATE TO HEAVY PRECIPITATION AND RUN-OFF)

PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	265 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	135 LBS
MULLEN BURST	ASTM D-3786	480 PSI
TRAPEZOID TEAR	ASTM D-4533	45 LBS
UV RESISTANCE	ASTM D-4355	90 %
APPARENT OPENING SIZE	ASTM D-4751	20 US SIEVE
FLOW RATE	ASTM D-4491	230 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	1.5 SEC -1

OIL-ABSORBANT SILTSACK®

(FOR AREAS WHERE THERE IS A CONCERN FOR OIL RUN-OFF OR SPILLS)
DEPENDING ON YOUR PARTICULAR APPLICATION, THE SILTSACK® CAN BE MADE FROM EITHER ONE OF THE ABOVE FABRICS WITH AN OIL-ABSORBANT PILLOW INSERT OR, MADE COMPLETELY FROM AN OIL-ABSORBANT SILTSACK®, WITH A WOVEN PILLOW INSERT.

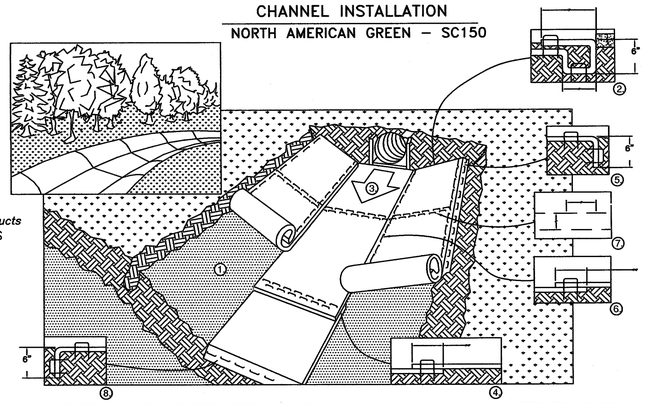


INSTALLATION DETAIL

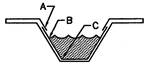
DETAIL OF INLET SEDIMENT CONTROL DEVICE
NOT TO SCALE

CHANNEL INSTALLATION
NORTH AMERICAN GREEN – SC150

NORTH AMERICAN GREEN
EROSION CONTROL *Products Guaranteed* SOLUTIONS



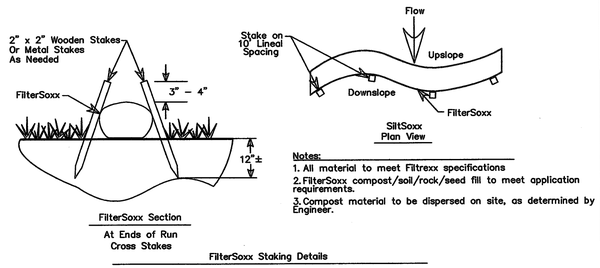
1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
   NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE RECP's IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" ACROSS THE WIDTH OF THE RECP's.
3. ROLL CENTER RECP's IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. PLACE CONSECUTIVE RECP's END OVER END (SHINGLE STYLE) WITH A 4" – 6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE RECP's.
5. FULL LENGTH EDGE OF RECP's AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT RECP's MUST BE OVERLAPPED APPROXIMATELY 2" – 5" (DEPENDING ON RECP's TYPE) AND STAPLED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE RECP's MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. NOTE: * IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY ANCHOR THE RECP's.



CRITICAL POINTS
A. OVERLAPS AND SEAMS
B. PROJECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

NOTE:
* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.

** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY ANCHOR THE RECP's.



SiltSoxx Details
NOT TO SCALE

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CITY OF DOVER
PLANNING BOARD FILE# P18-____

CIVILWORKS NEW ENGLAND
CIVIL ENGINEERING
181 Watson Road, P.O. Box 1166
Dover, New Hampshire 03820
(603) 749-0443

NO.	REVISION	APP'D	DATE

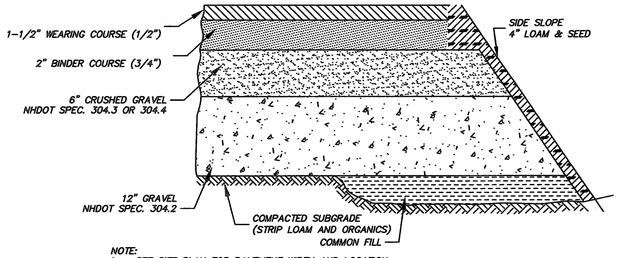
DATE: 7-18-18
SCALE: 1"=30'
DRAWN BY: SRD
DESIGN BY: MMR
APPROVED BY:SJH
PROJECT NO:1795
FILE: SITE.DWG

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

COCHECO LANDING
DOVER, NH

EROSION CONTROL DETAILS

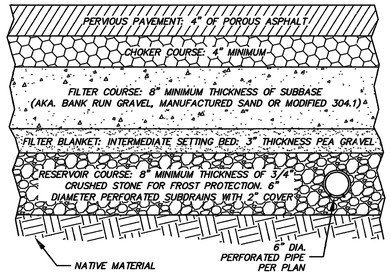
10



NOTE:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.

TYPICAL PAVEMENT SECTION

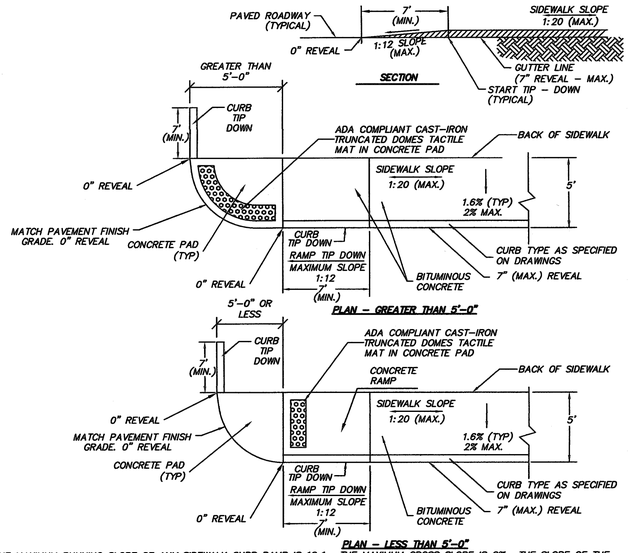
NOT TO SCALE



NOTE:
1. SEE SITE PLAN FOR LOCATION OF POROUS PAVEMENT, PAVEMENT WIDTH AND LOCATION.
2. CONSTRUCTION MATERIALS SHALL NOT BE STORED ON THE POROUS PAVEMENT OR BASE MATERIALS.
3. PLACEMENT OF POROUS PAVEMENT AND BASE MATERIALS SHALL BE MONITORED BY THE DESIGN ENGINEER. ADVISE THE CITY ENGINEER AS TO INSTALLATION SCHEDULE.
4. CRUSHED STONE, BANK RUN GRAVEL & CRUSHED GRAVEL MATERIALS SHALL CONFORM WITH NHDOT STD. SPECIFICATIONS, SECTION 304.
5. POROUS PAVEMENT SHALL CONFORM WITH GENERAL POROUS BITUMINOUS PAVING SPECIFICATIONS PREPARED BY THE UNH STORMWATER CENTER 2/14).
6. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.

POROUS PAVEMENT SECTION

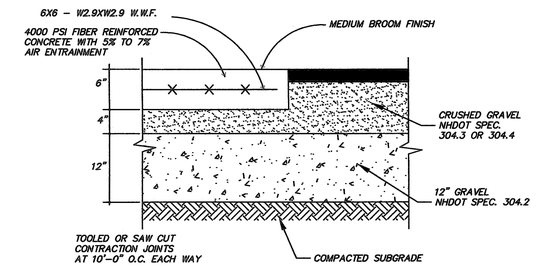
NOT TO SCALE



1. THE MAXIMUM RUNNING SLOPE OF ANY SIDEWALK CURB RAMP IS 12:1. THE MAXIMUM CROSS SLOPE IS 2% THE SLOPE OF THE LANDING SHALL NOT EXCEED 2% IN ANY DIRECTION.
2. TRANSITIONS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES. ROADWAY SHOULDER SLOPES ADJOINING SIDEWALK CURB RAMPS SHALL BE A MAXIMUM OF 5% (FULL WIDTH) FOR A DISTANCE OF 24" FROM THE ROADWAY CURBLINE.
3. INTERCEPT DRAINAGE ALONG THE CURB IN ADVANCE OF SIDEWALK CURB RAMP OF LANDINGS. CATCH BASINS, MANHOLES, ETC. SHALL NOT BE LOCATED IN OR AT THE BASE OF SIDEWALK CURB RAMPS OR LANDINGS.
4. BOTTOM OF THE SIDEWALK CURB RAMP OR LANDING EXCLUSIVE OF THE FLARED SIDES SHALL BE WHOLLY CONTAINED WITHIN THE CROSSWALK MARKINGS.
5. THE SURFACE OF A PERPENDICULAR SIDEWALK CURB RAMP OR THE LANDING OF A PARALLEL SIDEWALK CURB RAMP SHALL CONTRAST VISUALLY WITH THE ADJOINING SIDEWALK SURFACE, EITHER ASPHALT/LIGHT-COLORED CONCRETE OR LIGHT-COLORED CONCRETE/DARK-STAINED CONCRETE. THE CONCRETE SURFACE SHALL BE SLIP RESISTANT.
6. INSTALL DETECTABLE WARNINGS TACTILE MAT (TRUNCATED DOMES) AT THE LOCATIONS SHOWN. DETECTABLE WARNINGS SHALL MEASURE 24" IN THE DIRECTION OF TRAVEL AND EXTEND THE FULL WIDTH OF THE SIDEWALK RAMP AND THE EDGE NEAREST THE CURBLINE SHALL BE LOCATED 6" - 8" FROM THE FACE OF CURBLINE.
7. PROVIDE DETECTABLE WARNING SURFACE ANYTIME THAT A CURB RAMP, BLENDED TRANSITION OR LANDING CONNECTS TO A STREET.
8. WHERE BOTH ENDS OF THE BOTTOM GRADE ARE LESS THAN 5'-0" FROM THE BACK OF THE CURB, LOCATE THE DETECTABLE WARNING PANELS ON THE RAMP SURFACE AT THE BOTTOM OF THE RAMP. WHERE EITHER END OF THE BOTTOM GRADE IS GREATER THAN 5'-0" FROM THE BACK OF THE CURB, LOCATE THE DETECTABLE WARNING AT THE BOTTOM OF THE LANDING.

SIDEWALK TIP DOWN AT CURBED RADIUS PAD

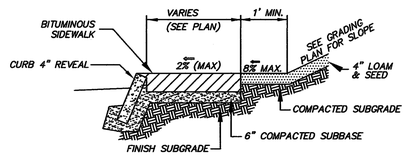
NOT TO SCALE



NOTE: PITCH CONCRETE PAD GRADING TO CENTER

DUMPSTER DETAIL

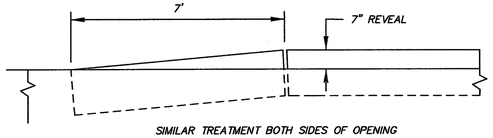
NOT TO SCALE



SLOPED GRANITE CURB & BITUMINOUS SIDEWALK

NOT TO SCALE

GRANITE CURB & MORTAR JOINTS
SLOPE LAST SECTION TO MEET EXISTING GROUND

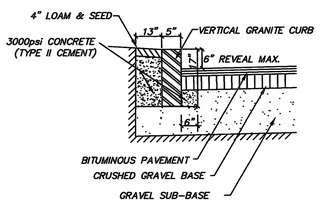


SIMILAR TREATMENT BOTH SIDES OF OPENING

"TIP-DOWN" CURB DETAIL

NOT TO SCALE

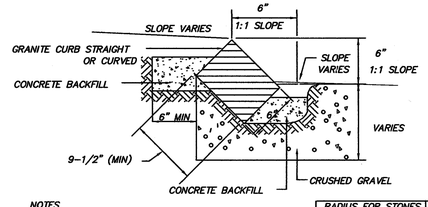
RADIUS	MAX. LENGTH
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
OVER 60'	10'



NOTES
1. SEE SITE PLAN FOR LIMITS OF CURBING.
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF CURB STONES = 3'
4. MAXIMUM LENGTH OF CURB STONES = 10'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE CHART)
6. ALL RADII 20 FEET AND SMALLER TO BE CONSTRUCTED USING CURVED SECTIONS.

VERTICAL GRANITE CURB

NOT TO SCALE



NOTES
1. ADJOINING STONES OF STRAIGHT CURB LAID ON CURVES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH
2. MINIMUM LENGTH OF STRAIGHT CURB STONES = 18"
3. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES - SEE CHART

RADIUS FOR STONES WITH SQUARE JOINTS	MAXIMUM LENGTH
16'-28'	1'-6"
29'-41'	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
OVER 110'	8'

SLOPED GRANITE CURBING

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Dover, New Hampshire 03820
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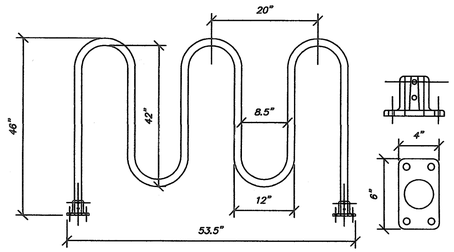
DATE: 7-18-18
SCALE: 1"=30'
DRAWN BY: SRD
DESIGN BY: MMR
APPROVED BY:SJH
PROJECT NO:1795
FILE: SITE.DWG

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

COCHECO LANDING
DOVER, NH

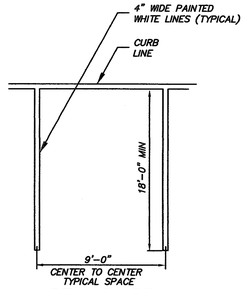
DETAIL SHEET

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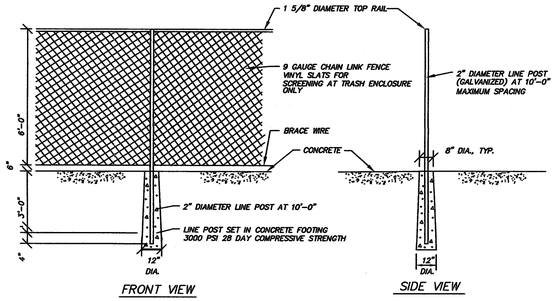


BIKE RACK DETAIL

NOT TO SCALE



STANDARD

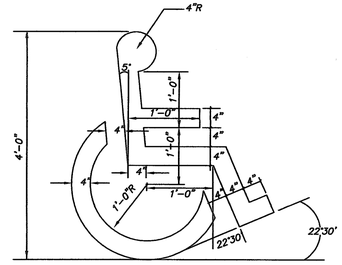


FRONT VIEW SIDE VIEW

NOTES:
1. DUMPSTER CHAINLINK FENCE SHALL HAVE GREEN VINYL PRIVACY SLATS 6' HIGH.
2. 4' HIGH CHAINLINK FENCE INFRONT OF RETAINING WALL

CHAINLINK FENCE DETAIL

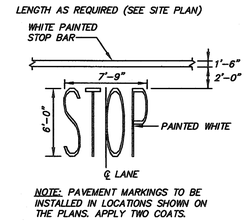
NOT TO SCALE



NOTE: SYMBOL TO BE PAINTED IN ALL HANDICAPPED SPACES

PAINTED HANDICAP SYMBOL

NOT TO SCALE

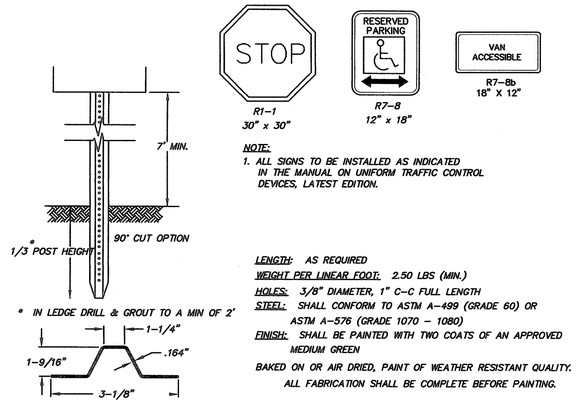


NOTE: PAVEMENT MARKINGS TO BE INSTALLED IN LOCATIONS SHOWN ON THE PLANS. APPLY TWO COATS.

STOP BAR & LEGEND

PAVEMENT MARKINGS

NOT TO SCALE

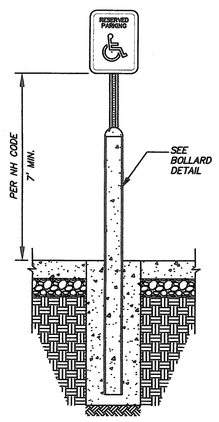


NOTE:
1. ALL SIGNS TO BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070 - 1080)
FINISH: SHALL BE PAINTED WITH TWO COATS OF AN APPROVED MEDIUM GREEN
BAKED ON OR AIR DRIED, PAINT OF WEATHER RESISTANT QUALITY.
ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.

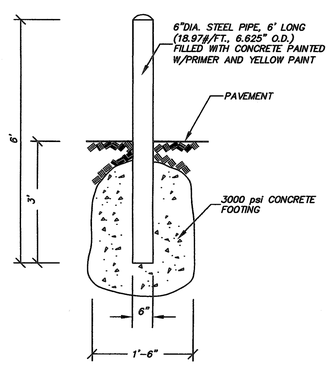
SIGN LEGEND & SIGN POST

NOT TO SCALE



SIGN IN BOLLARD

NOT TO SCALE



BOLLARD DETAIL

NOT TO SCALE

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CITY OF DOVER
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P18-____

CIVILWORKS NEW ENGLAND
CIVIL ENGINEERING
181 Watson Road, P.O. Box 1166
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APPROVED BY:SJH
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DETAIL SHEET

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

COCHECO LANDING
DOVER, NH

12

BUILDING #3 GRADING DETAIL

SCALE 1"=10'

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CITY OF DOVER
PLANNING BOARD FILE#
P18-___

CIVILWORKS NEW ENGLAND
Civil Engineering, Inc.
181 Watson Road, P.O. Box 1166
Dover, New Hampshire 03820
(603) 749-0443

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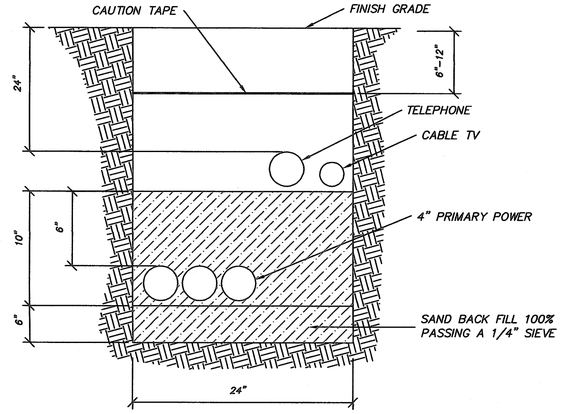
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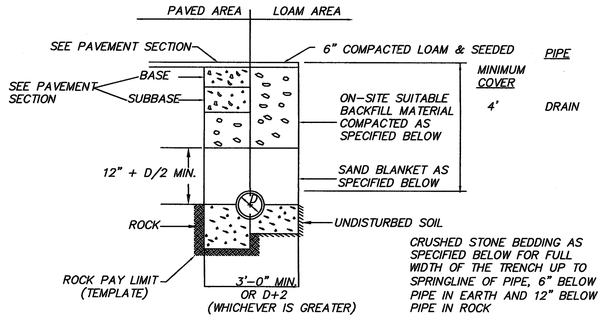
13



1. TELEPHONE CONDUIT SHALL BE 3" SCHEDULE 40 PVC, WITH STEEL SWEEPS AT RISER POLE, 90° BENDS AND AT BUILDING.
2. LEAVE PULL ROPE IN ALL CONDUITS FOR CABLE INSTALLATION.
3. FOR COMPLETE SPECIFICATIONS SEE "PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE CONSTRUCTION SPECIFICATIONS FOR UNDERGROUND CONDUIT SYSTEMS".
4. CONTRACTOR SHOULD VERIFY THE NUMBER & SIZE OF CONDUIT WITH THE APPROPRIATE UTILITIES.

UTILITY TRENCH

NOT TO SCALE



BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

SAND BLANKET & BEDDING

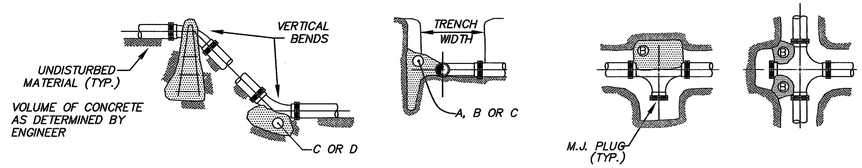
SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15
(FOR WATER MAIN BEDDING)	

3/4" CRUSHED STONE BEDDING

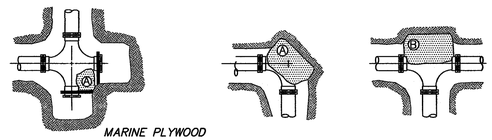
SIEVE SIZE	% FINER BY WEIGHT
1"	100
3/4"	90 – 100
1/2"	20 – 50
3/8"	0 – 20
# 4	0 – 5

DRAINAGE TRENCH

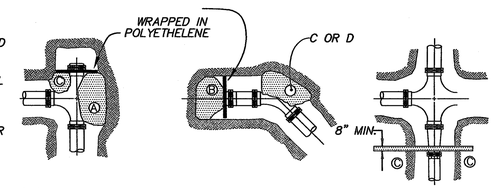
NOT TO SCALE



TEST PRESSURE = 200psi	SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL					
	REACTION TYPE	PIPE SIZE				
		4"	6"	8"	10"	12"
	A 90°	0.89	2.19	3.82	11.14	17.24
	B 180°	0.65	1.55	2.78	8.38	12.00
	C 45°	0.48	1.19	2.12	6.02	9.32
	D 22-1/2°	0.25	0.60	1.06	3.08	4.74
	E 11-1/4°	0.13	0.30	0.54	1.54	2.38

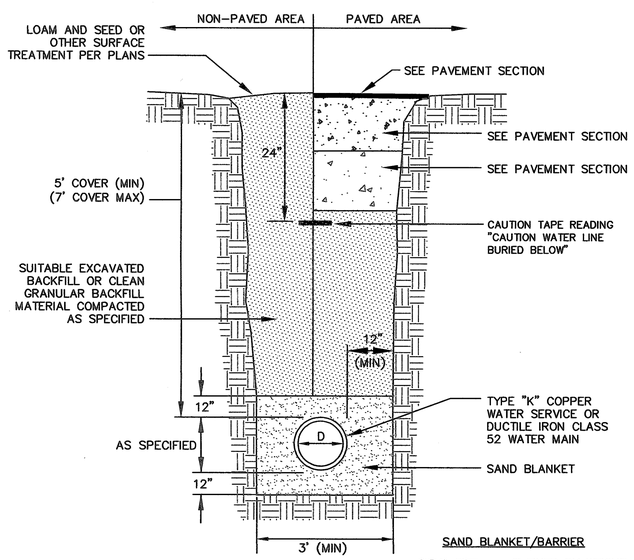


NOTES:
1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL, WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
3. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS.
4. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.



TRUST BLOCK DETAIL

NOT TO SCALE



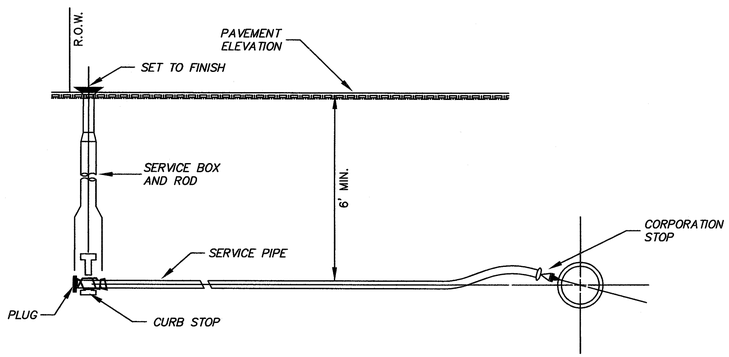
SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

NOTES
1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

WATER MAIN TRENCH

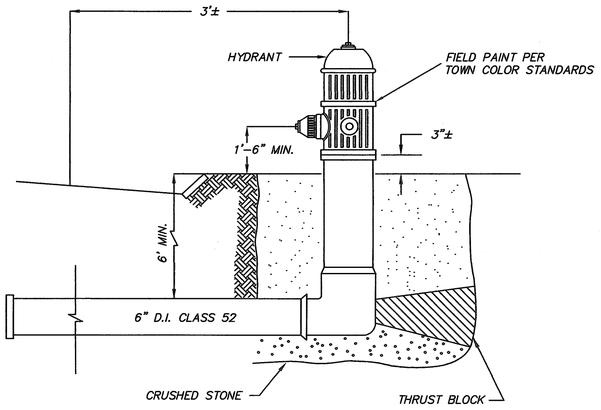
NOT TO SCALE



TYPICAL WATER SERVICE CONNECTION

NOT TO SCALE

NOTE:
HYDRANT INSTALLATION & OPERATION TO CONFORM TO REGULATIONS OF CITY OF DOVER FIRE DEPARTMENT.



FIRE HYDRANT DETAIL

NOT TO SCALE

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

CITY OF DOVER
PLANNING BOARD FILE#
P18-___

CIVILWORKS NEW ENGLAND
CIVIL ENGINEERING
181 Watson Road, P.O. Box 1166
Dover, New Hampshire 03820
(603) 749-0443

NO.	REVISION	APP'D	DATE

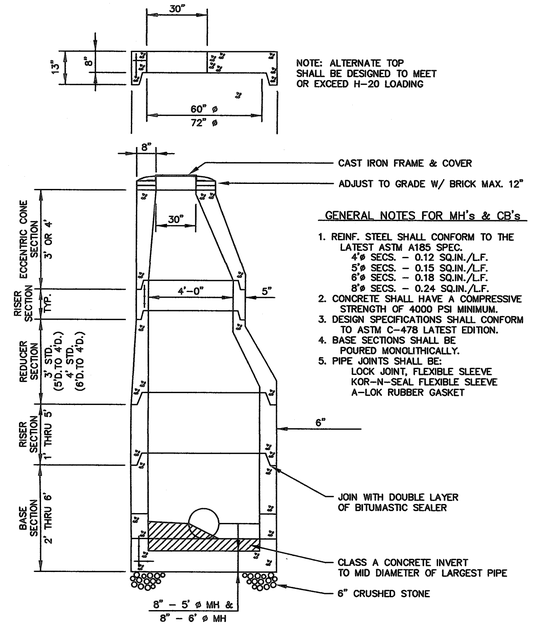
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SCALE: 1"=30'
DRAWN BY: SRD
DESIGN BY: MMR
APPROVED BY:SJH
PROJECT NO:1795
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COCHECO LANDING
DOVER, NH

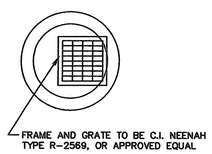
DETAIL SHEET

14



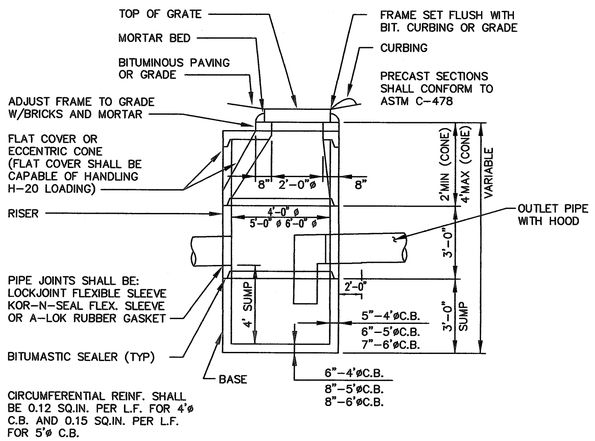
STANDARD 4 FT. DIA. MANHOLE

NOT TO SCALE



GRATE DETAIL

NOT TO SCALE



PRE-CAST REINFORCED CATCH BASIN

NOT TO SCALE

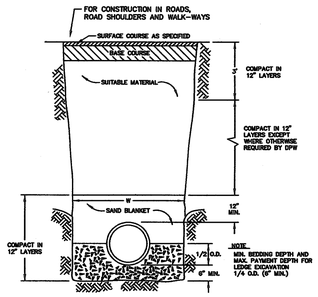
GENERAL NOTES FOR MH's & CB's

1. REINF. STEEL SHALL CONFORM TO THE LATEST ASTM A185 SPEC.
   4'ø SECS. – 0.12 SQ.IN./L.F.
   5'ø SECS. – 0.15 SQ.IN./L.F.
   6'ø SECS. – 0.18 SQ.IN./L.F.
   8'ø SECS. – 0.24 SQ.IN./L.F.
2. CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 4000 PSI MINIMUM.
3. DESIGN SPECIFICATIONS SHALL CONFORM TO ASTM C-478 LATEST EDITION.
4. BASE SECTIONS SHALL BE POURED MONOLITHICALLY.
5. PIPE JOINTS SHALL BE:
   LOCK JOINT, FLEXIBLE SLEEVE
   KOR-N-SEAL FLEXIBLE SLEEVE
   A-LOK RUBBER GASKET

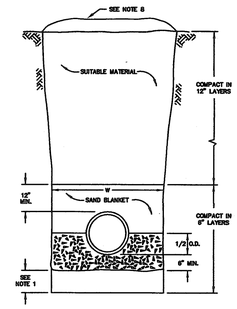
SPECIFICATIONS

1. All construction shall conform with the State of New Hampshire Department of Transportation (NHDOT), "Standard Specifications for Road and Bridge Construction"; hereinafter referred to as the "Standard Specifications".
2. Catch basins and manholes shall be pre-cast reinforced concrete designed by an engineer registered in New Hampshire, and able to withstand loadings of 8 tons (H20 Loading).
3. Manholes shall have cast iron frames and covers with 30" inside diameter openings. A 3-inch (minimum) letter "D" for drain shall be plainly cast into the center of each cover.
4. Catch basins and manholes shall be adjusted to grade with courses of brick. Maximum adjustment to grade shall be 12 inches. Frames shall be set on a full bed of mortar, true to grade and concentric with the masonry. All voids between the top of the structure and the bottom flange of the frame shall be completely filled to make a watertight fit. A ring of mortar at least one inch thick and pitched to shed water away from the frame, shall be placed over and around the outside of the bottom flange. The mortar shall extend to the outer edge of the masonry all around its circumference and shall be finished smooth. No visible leakage will be permitted.
5. Invert channels of sewer manholes shall be formed smoothly to the largest pipe radius. Changes in grade shall be formed smoothly and evenly. The floor of the structure outside the channels shall be sloped towards the channels at approximately 1/2 inch per foot. The floor at the channel shall match the crown of the largest pipe.
6. Trench construction will conform with Section 603.3.1 of the Standard Specifications (1974).
7. Wood sheeting or a suitable trench box shall be used to support the trench as necessary. If wood sheeting is used, it shall be driven at a distance of 1 foot from the outside diameter of the pipe to a depth 6 inches below the invert of the pipe. Wood sheeting shall be cut off and left in place to an elevation not less than 1 foot above the top of the pipe, but not greater than 3 feet below the finished grade.
8. Bedding shall conform with Section 603.3.2 of the Standard Specifications (1974).
9. Backfill material will conform with Section 603.3.5 of the Standard Specifications (1974) and, in addition, shall exclude debris, pieces of pavement, organic matter, top soil, all wet or soft muck, peat or clay, all excavated ledge material, frozen material, all rocks over 6 inches in largest dimension, or any material which, as determined by the Engineer, will not provide sufficient support or maintain the completed construction in a stable condition. Backfill shall not be placed on frozen or previously frozen material.
10. All backfill and bedding compaction shall meet the requirements of AASHTO 99 Method C. Density shall be 95 percent. Compaction shall be 6 inch lifts for bedding and backfill to a plane 1 foot above the pipe and in 12 inch lifts thereafter by an approved mechanical compactor.
11. Should frozen material be encountered, it shall not be placed in the backfill nor shall backfill be placed upon frozen material. Previously frozen material shall be removed as required before new backfill is placed.
12. The Contractor shall be responsible for any damage to frames and grates during and from the time of removal from the existing structure to and during the time of resetting, and shall replace in kind any damaged frames or grates at no additional compensation.
13. All trenches will be covered and debris, including any rejected materials, shall be removed daily. Strict safety precautions shall be maintained at all times.
14. Location of utilities shown on the plans are approximate.
    a) the Contractor shall, 48 hours prior to construction, notify the utility companies and have all utilities in the vicinity of the construction marked in the field.
    b) after the utilities have been located and prior to construction, the Contractor with the Engineer, shall layout the proposed drainage system in the field and rectify any utility conflicts which may be found.
    c) Any conflicts with utilities found during construction by the Contractor shall be immediately brought to the attention of the Engineer and the Utility Company and properly rectified.
    d) The Contractor is responsible for the cost of repair for any utilities damaged during construction. The Contractor shall contact the Utility Company to repair any damages, however, the Contractor may make appropriate repairs with the Utility Company's permission.
15. Complete shop drawings for pipe, manholes, catch basins, frames, grates and covers shall be submitted in triplicate for approval by the Engineer prior to the start of construction. Each shop drawing shall be checked and initialized by the Contractor to indicate approval before it is submitted to the Engineer.
16. Shop drawings for flat concrete covers shall be stamped prior to submission for approval by a New Hampshire Registered Professional Engineer.
17. Brick masonry for setting frames and brick and mortar plugs shall conform to the Standard Specification Section 604.2.4.

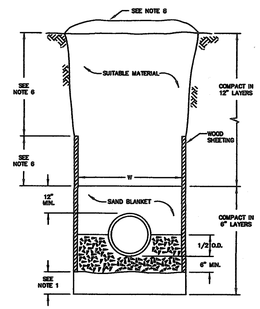
STANDARD TRENCH SECTION



LEDGE CONSTRUCTION



EARTH CONSTRUCTION



EARTH CONSTRUCTION WITH SHEETING

NOTES:

1.) ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE. REFILL WITH BEDDING MATERIAL. SEE ALSO NOTE 7.

2.) BEDDING : SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33 STONE SIZE NO. 67.

100% PASSING	1 INCH SCREEN
90 – 100% PASSING	3/4 INCH SCREEN
20 – 55% PASSING	3/8 INCH SCREEN
0 – 10% PASSING	#4 SIEVE
0 – 5% PASSING	#8 SIEVE

– CRUSHED STONE 1/2 INCH – 1 1/2 INCH MAY BE USED INSTEAD OF SCREENED GRAVEL WHERE ALLOWED BY THE ENGINEER.

3.) SAND BLANKET : CLEAN SAND FREE FROM ORGANIC MATTER SO GRADED THAT 90–100% PASSES A 1/2 INCH SIEVE AND NOT MORE THAN 15% WILL PASS A #200 SIEVE.

4.) SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALK-WAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT OR CLAY, ALL EXCAVATED LEDGE MATERIAL, AND ALL ROCKS OVER SIX INCHES IN LARGEST DIMENSION, OR ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.

IN CROSS-COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK OR PEAT, IF HE IS SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER FOR MAINTENANCE AND POSSIBLY RECONSTRUCTION, WHEN NECESSARY, WILL BE PRESERVED.

5.) BASE COURSE , IF ORDERED BY THE ENGINEER, SHALL MEET THE REQUIREMENTS OF DIVISION 300 OF THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OF THE STATE OF NEW HAMPSHIRE, DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS, (D.O.T.).

6.) WOOD SHEETING , IF REQUIRED. WHERE SHEETING IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID-DIAMETER, IT SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE. WHERE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW FINISHED GRADE, BUT NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE.

7.) W = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES; FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE O.D. W SHALL ALSO BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.

8.) FOR CROSS COUNTRY CONSTRUCTION , BACKFILL OR FILL SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.

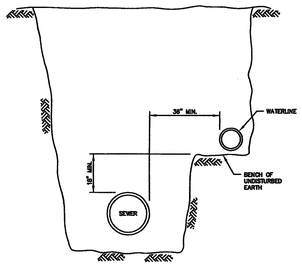
9.) CONCRETE FOR ENCASEMENT SHALL CONFORM TO THE REQUIREMENTS FOR CLASS A (3000#) CONCRETE OF THE NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATIONS AS FOLLOWS:

CEMENT: 6.0 BAGS PER CUBIC YARD
WATER : 5.75 GALLONS PER BAG CEMENT
MAXIMUM SIZE OF AGGREGATE: 1 INCH

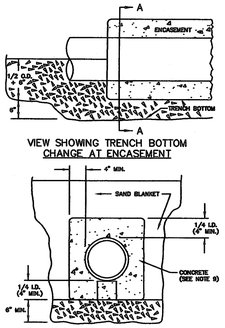
10.) NEW HAMPSHIRE WATER SUPPLY AND POLLUTION CONTROL COMMISSION (NH DES) DESIGN STANDARDS REQUIRE 10 FT. SEPARATION. HOWEVER, SHOULD CONSTRUCTION OPERATIONS REVEAL OR EXPOSE A WATERLINE (MAIN OR SERVICE) RUNNING APPROXIMATELY PARALLEL AND LESS THAN 10 FT. HORIZONTAL FROM THE PROPOSED SEWER INSTALLATION AND WHERE IT IS NOT PRACTICABLE TO RELOCATE THE SEWER, THE FOLLOWING METHODS OF PROTECTION MUST BE EMPLOYED.

A. IF THE WATERLINE CAN BE KEPT AT LEAST 18 INCHES ABOVE AND 3 FEET TO ONE SIDE OF THE SEWER, AS SHOWN AND SUPPORTED ON A BENCH OF ORIGINAL SOIL, NO OTHER PROTECTION IS REQUIRED.

11.) IF FULL CASEMENT IS UTILIZED, DEPTH OF CONCRETE BELOW PIPE SHALL BE 1/4 I.D. (4" MIN.) BLOCK SUPPORT SHALL BE SOLID CONCRETE BLOCKS.



WATER AND SEWER IN SAME TRENCH



CONCRETE FULL ENCASEMENT

(SEE NOTE 11)

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

CITY OF DOVER
PLANNING BOARD FILE#
P18–

CIVILWORKS NEW ENGLAND
CIVIL ENGINEERING
181 Watson Road, P.O. Box 1166
Dover, New Hampshire 03820
(603) 749-0443

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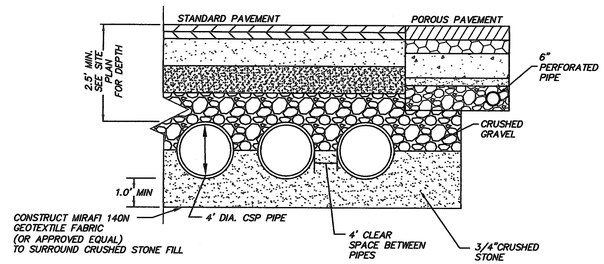
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SCALE: 1"=30'
DRAWN BY: SRD
DESIGN BY: MMR
APPROVED BY:S.H
PROJECT NO:1795
FILE:SITE.DWG

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

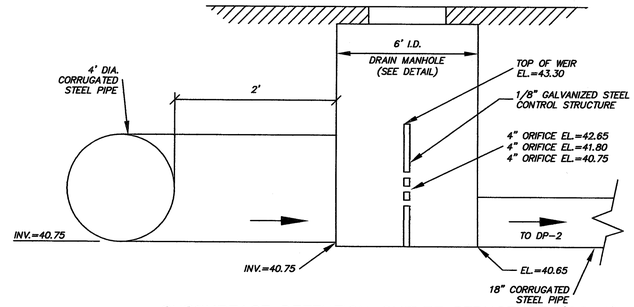
COCHECO LANDING
DOVER, NH

DETAIL SHEET

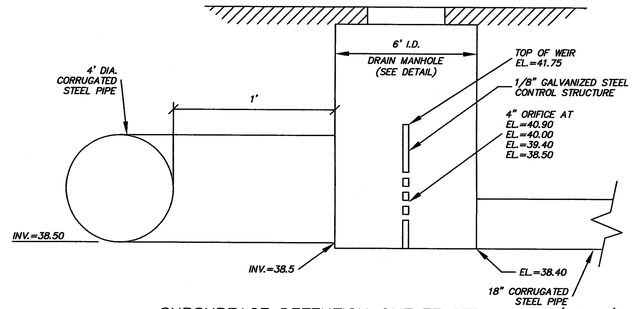
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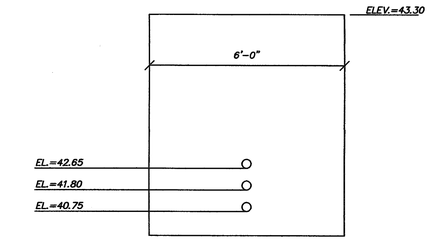
SUBSURFACE DETENTION AREA
SECTION A–A
NOT TO SCALE



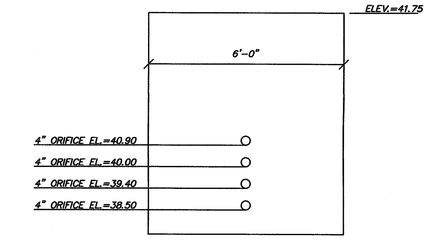
SUBSURFACE DETENTION OUTLET STRUCTURE (OS–1)
FOR DETENTION POND 1 PDMH2
NOT TO SCALE



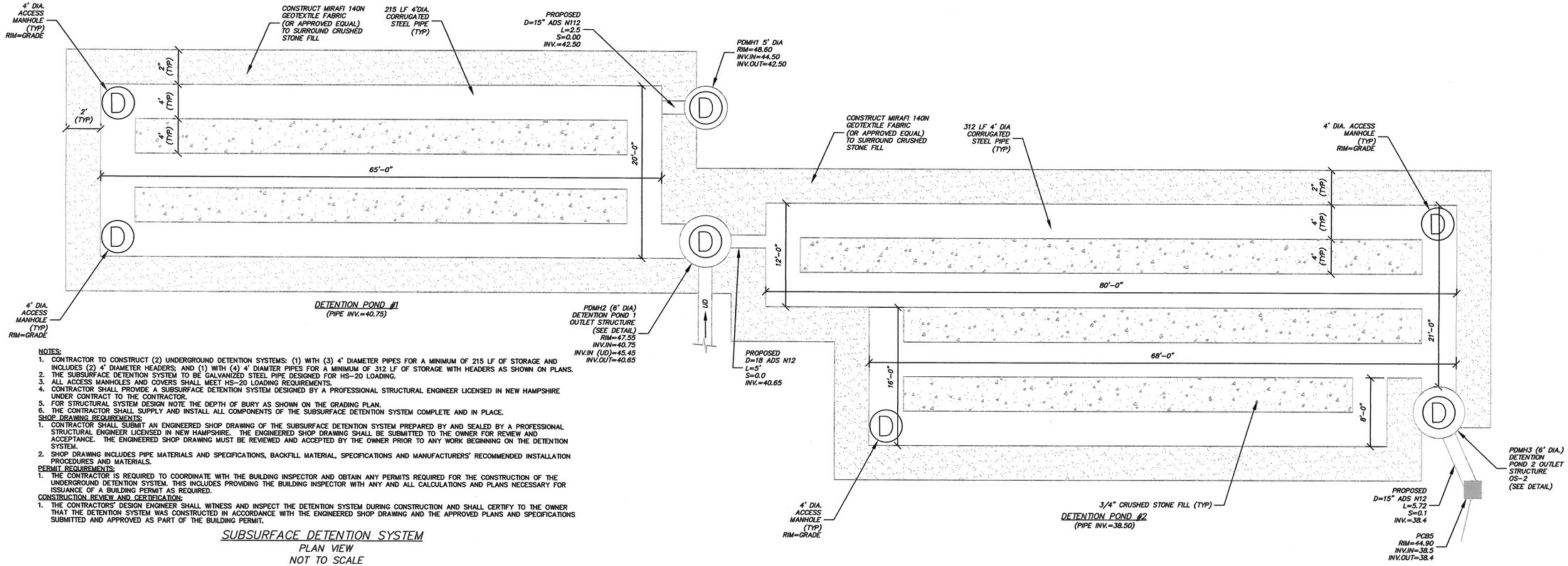
SUBSURFACE DETENTION OUTLET STRUCTURE (OS–2)
FOR DETENTION POND 2
NOT TO SCALE



1/8" GALVANIZED STEEL CONTROL STRUCTURE (DETENTION POND 1 OUTLET)
NOT TO SCALE



1/8" GALVANIZED STEEL CONTROL STRUCTURE (DETENTION POND 2 OUTLET)
NOT TO SCALE



NOTES:
1. CONTRACTOR TO CONSTRUCT (2) UNDERGROUND DETENTION SYSTEMS: (1) WITH (3) 4' DIAMETER PIPES FOR A MINIMUM OF 215 LF OF STORAGE AND INCLUDES (2) 4' DIAMETER HEADERS; AND (1) WITH (4) 4' DIAMTER PIPES FOR A MINIMUM OF 312 LF OF STORAGE WITH HEADERS AS SHOWN ON PLANS.
2. THE SUBSURFACE DETENTION SYSTEM TO BE GALVANIZED STEEL PIPE DESIGNED FOR HS–20 LOADING.
3. ALL ACCESS MANHOLES AND COVERS SHALL MEET HS–20 LOADING REQUIREMENTS.
4. CONTRACTOR SHALL PROVIDE A SUBSURFACE DETENTION SYSTEM DESIGNED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN NEW HAMPSHIRE UNDER CONTRACT TO THE CONTRACTOR.
5. FOR STRUCTURAL SYSTEM DESIGN NOTE THE DEPTH OF BURY AS SHOWN ON THE GRADING PLAN.
6. THE CONTRACTOR SHALL SUPPLY AND INSTALL ALL COMPONENTS OF THE SUBSURFACE DETENTION SYSTEM COMPLETE AND IN PLACE.

SHOP DRAWING REQUIREMENTS:
1. CONTRACTOR SHALL SUBMIT AN ENGINEERED SHOP DRAWING OF THE SUBSURFACE DETENTION SYSTEM PREPARED BY AND SEALED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN NEW HAMPSHIRE. THE ENGINEERED SHOP DRAWING SHALL BE SUBMITTED TO THE OWNER FOR REVIEW AND ACCEPTANCE. THE ENGINEERED SHOP DRAWING MUST BE REVIEWED AND ACCEPTED BY THE OWNER PRIOR TO ANY WORK BEGINNING ON THE DETENTION SYSTEM.
2. SHOP DRAWING INCLUDES PIPE MATERIALS AND SPECIFICATIONS, BACKFILL MATERIAL, SPECIFICATIONS AND MANUFACTURERS' RECOMMENDED INSTALLATION PROCEDURES AND MATERIALS.

PERMIT REQUIREMENTS:
1. THE CONTRACTOR IS REQUIRED TO COORDINATE WITH THE BUILDING INSPECTOR AND OBTAIN ANY PERMITS REQUIRED FOR THE CONSTRUCTION OF THE UNDERGROUND DETENTION SYSTEM. THIS INCLUDES PROVIDING THE BUILDING INSPECTOR WITH ANY AND ALL CALCULATIONS AND PLANS NECESSARY FOR ISSUANCE OF A BUILDING PERMIT AS REQUIRED.

CONSTRUCTION REVIEW AND CERTIFICATION:
1. THE CONTRACTORS' DESIGN ENGINEER SHALL WITNESS AND INSPECT THE DETENTION SYSTEM DURING CONSTRUCTION AND SHALL CERTIFY TO THE OWNER THAT THE DETENTION SYSTEM WAS CONSTRUCTED IN ACCORDANCE WITH THE ENGINEERED SHOP DRAWING AND THE APPROVED PLANS AND SPECIFICATIONS SUBMITTED AND APPROVED AS PART OF THE BUILDING PERMIT.

SUBSURFACE DETENTION SYSTEM
PLAN VIEW
NOT TO SCALE

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CITY OF DOVER
PLANNING BOARD FILE#
P18–___

CIVILWORKS NEW ENGLAND
CIVIL ENGINEERING
181 Watson Road, P.O. Box 1166
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NO.	REVISION	APP'D	DATE

DATE: 7–18–18
SCALE: 1"=30'
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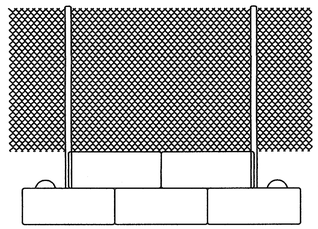
DETAIL SHEET

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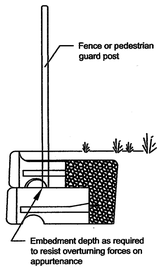
COCHECO LANDING
DOVER, NH

16

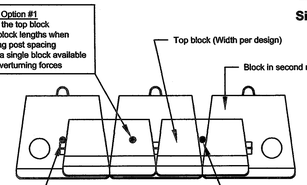
Fence or Pedestrian Guard Connection Locations



Front View



Side View



Top View

Connection Option #1
Anchor into the top block
- Consider block lengths when determining post spacing
- Weight of a single block available to resist overturning forces

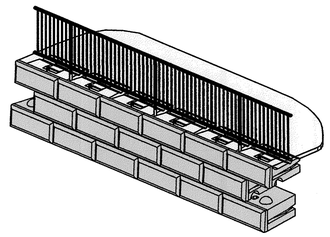
Connection Option #2
Grout posts in v-shaped opening between top blocks
- Spacing in multiples of 46 1/8" (1172 mm)
- Weight of a 2 adjacent blocks available to resist overturning forces

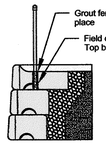
Connection Option #3
Core through top block and grout posts in V-shaped opening between lower blocks
- Spacing in multiples of 46 1/8" (1172 mm)
- Weight of a 2 adjacent blocks on second level down and 3 top row blocks available to resist overturning forces

This drawing is for reference only. Determination of the suitability and/or manner of use of any details contained in this document is the sole responsibility of the design engineer of record. Final project designs, including all construction details, shall be prepared by a licensed professional engineer using the actual conditions of the proposed site.

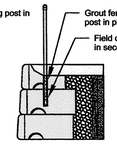
DRAWN BY:	JRJ
APPROVED BY:	JRJ
DATE:	06-22-2015
SHEET:	1 of 1
TITLE:	Fence or Pedestrian Guard Connection Locations
FILE:	6 Fence or Pedestrian Guard Connection Locations 062215.dwg

Fence or Pedestrian Guard Connection Options



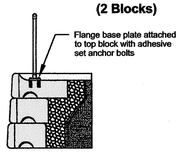


Grouted Connection (1 Block)

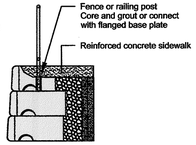


Grouted Connection (2 Blocks)

These generic pedestrian guard and fence details show a few potential options for their installation on the top of a Redi-Rock retaining wall. It is the design engineer's responsibility to fully design and detail the connection of the guard posts to the retaining wall blocks and assure acceptable resistance to the applied forces. Redi-Rock blocks are plain concrete, without steel reinforcement.



Flange Bolted Connection



Moment Slab Connection

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DRAWN BY:	JRJ
APPROVED BY:	JRJ
DATE:	06-22-2015
SHEET:	1 of 1
TITLE:	Fence or Pedestrian Guard Connection Options
FILE:	5 Fence or Pedestrian Guard Connection Options 062215.dwg

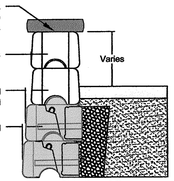
Freestanding Blocks with Cap at Top of Wall

Secure cap block to freestanding block with polyurethane sealant. Optional shear lugs cast into cap block or rebar ties that can be embedded in site-cast concrete (with garden block) are also available.

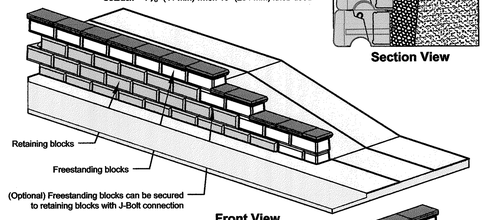
Setback = 0" (0 mm) on Freestanding blocks

Setback = 2 3/8" (73 mm) when 10" (254 mm) knob used
Setback = 1 3/8" (41 mm) when 7 1/2" (190 mm) knob used

Setback = 1 3/8" (41 mm) when 10" (254 mm) knob used

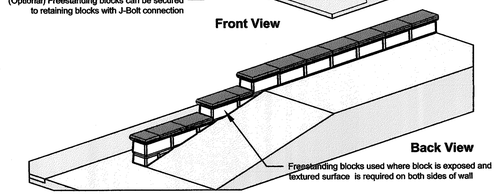


Section View



(Optional) Freestanding blocks can be secured to retaining blocks with J-Bolt connection

Front View



Back View

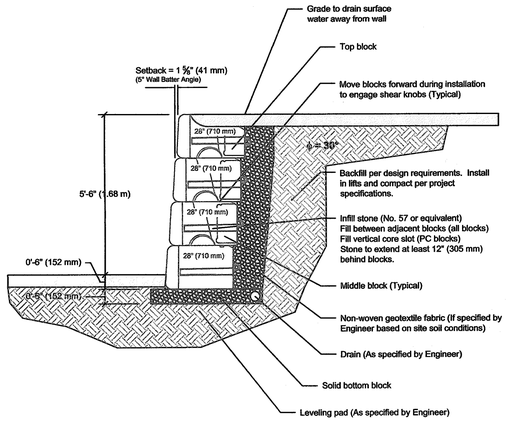
One-component, highly flexible, non-priming, gun grade, high performance elastomeric polyurethane sealant shall have movement of plus or minus 25% per ASTM C719, tensile strength greater than 200 psi (1.4 MPa) per ASTM D412, and adhesion to peel on concrete greater than 20 PLI per ASTM C794. Apply sealant in one and one half-inch (1.5") (38 mm) diameter round "hersey kiss" shaped dollops located in two rows at the top of the Freestanding blocks at 8" (203 mm) on center.

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DRAWN BY:	JRJ
APPROVED BY:	JRJ
DATE:	06-22-2015
SHEET:	1 of 1
TITLE:	Freestanding Blocks with Cap at Top of Wall
FILE:	3 Freestanding Blocks with Cap at Top of Wall 062215.dwg

LOAD CONDITION A | NO LIVE LOAD SURCHARGE, NO BACK SLOPE, NO TOE SLOPE

4 BLOCK HIGH SECTION
(4) 28" (710 mm) Blocks



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DRAWN BY:	C. Kruger
APPROVED BY:	J. Johnson
DATE:	June 8, 2015
SHEET:	1 of 1
TITLE:	**Preliminary Wall Section** Fine to Medium Sand or Silty Sand, ϕ = 30° No Live Load Surcharge, No Back Slope, No Toe Slope
FILE:	A_30_B_28_72_cad.dwg

CONTRACTOR TO COORDINATE WITH OWNER FOR FENCE STYLE

GENERAL NOTES

1. SEGMENTAL CONCRETE UNIT RETAINING WALL SHALL BE PROVIDED BY redi-rock ? OR SHEA WALL SYSTEMS OR APPROVED EQUAL.
2. RETAINING WALL DESIGN AND INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S STANDARDS.
3. STRIP VEGETATION AND ORGANIC SOIL FROM WALL AND GEOSYNTHETIC ALIGNMENT.
4. BENCH CUT ALL EXCAVATED SLOPES.
5. DO NOT OVER EXCAVATE UNLESS DIRECTED BY SITE SOIL ENGINEER TO REMOVE UNSUITABLE SOIL.
6. SITE SOILS ENGINEER SHALL VERIFY FOUNDATION SOILS AS BEING COMPETENT PER THE DESIGN STANDARDS AND PARAMETERS.
7. LEVELING PAD SHALL CONSIST OF COMPACTED COARSE SAND OR CRUSHED GRAVEL, 6" THICK MIN. AS STIPULATED BY THE MANUFACTURER.
8. CONTRACTOR MAY OPT FOR A LEAN CONCRETE PAD. CONCRETE PAD SHALL BE UNREINFORCED, 3" THICK MAXIMUM.
9. MINIMUM EMBEDMENT OF WALL BELOW FINISH GRADE SHALL BE 6" FOR WALL HEIGHTS UNDER 4 FT. AND 12" FOR WALLS OVER 4 FT. UNLESS SHOWN DIFFERENTLY.
10. FOR UNITS TO BE EMBEDDED, COMPACT FILL IN FRONT OF UNITS AT THE SAME TIME FILL BEHIND UNITS IS COMPACTED.
11. DRAINAGE AGGREGATE SHALL BE INSTALLED DIRECTLY BEHIND THE WALL WITHIN 12" OF THE TOP OF THE WALL. DRAINAGE AGGREGATE SHALL NOT EXTEND BELOW FINAL GRADE IN FRONT OF WALL.
12. COMPACTION SHALL BE TO 95% OF MAXIMUM STANDARD PROCTOR DENSITY.(ASTM D-698)
13. COMPACTION TESTS SHALL BE TAKEN AS THE WALL IS INSTALLED. THE MINIMUM NUMBER OF 3 TESTS PER WALL AND/OR AS DETERMINED BY THE SITE SOILS ENGINEER.
14. COMPACTION WITHIN 3 FT. OF WALL SHALL BE LIMITED TO HAND OPERATED EQUIPMENT.
15. IF REQUIRED SEE ELEVATION DRAWINGS FOR GEOSYNTHETIC TYPE, LENGTH AND LOCATION.
16. IF REQUIRED GEOSYNTHETIC SHALL BE PLACED WITH STRONGEST DIRECTION PERPENDICULAR TO WALL. FOLLOW GEOSYNTHETIC MANUFACTURER'S INSTALLATION INSTRUCTIONS AND WRITTEN SPECIFICATIONS.
17. CONTRACTOR SHALL DIRECT SURFACE RUNOFF TO AVOID DAMAGING WALL WHILE UNDER CONSTRUCTION.
18. ANY SURFACE DRAINAGE FEATURES, FINISH GRADING, PAVEMENT, OR TURF SHALL BE INSTALLED IMMEDIATELY AFTER WALL IS COMPLETED.
19. FOLLOW APPLICABLE PROVISIONS AS DICTATED BY THE MANUFACTURER.

1.4 REQUIREMENTS FOR CONTRACTOR PREPARED DESIGN AND PLANS

A. THE FINAL DESIGN TO BE SUBMITTED PRIOR TO AWARD OF CONTRACT AND SHALL INCLUDE DETAILED DESIGN COMPUTATIONS AND ALL DETAILS, DIMENSIONS, QUANTITIES AND CROSS SECTIONS NECESSARY TO CONSTRUCT THE WALL. THE DESIGN SHALL CONFORM TO ALL OF THE REQUIREMENTS OUTLINED IN SECTION 1.3 ABOVE. THE FULLY DETAILED PLANS SHALL BE ON PERMANENT, ARCHIVAL QUALITY, 24" X 36" DOUBLE MATTE MYLAR WITH PROJECT NAME, NUMBER AND DESIGN FIRM. THE PLANS TO BE SUBMITTED SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING ITEMS:

1. A PLAN AND ELEVATION SHEET OR SHEETS FOR EACH WALL, CONTAINING THE FOLLOWING:
   - A. AN ELEVATION VIEW OF THE WALL WHICH SHALL INDICATE THE ELEVATION AT THE TOP OF THE WALL, AT ALL HORIZONTAL AND VERTICAL BREAK POINTS AND AT LEAST EVERY FIFTY (50) FEET ALONG THE WALL, ELEVATIONS AT THE TOP OF LEVELING PADS, THE DESIGNATION AS TO THE TYPE OF UNIT, AND THE LOCATION OF THE ORIGINAL AND FINAL GROUND LINE.
   - B. A PLAN VIEW OF THE WALL WHICH SHALL INDICATE THE OFFSET FROM THE CONSTRUCTION CENTERLINE OR BASELINE TO THE FACE OF THE WALL AT ALL CHANGES IN HORIZONTAL ALIGNMENT AND THE LIMIT OF THE WIDEST UNIT.
   - C. ANY GENERAL NOTES REQUIRED FOR DESIGN AND CONSTRUCTION OF THE WALL.
   - D. ALL HORIZONTAL AND VERTICAL CURVE DATA AFFECTING WALL CONSTRUCTION.
2. ALL DETAILS FOR LEVELING PADS, AS WELL AS ALLOWABLE AND CALCULATED MAXIMUM BEARING PRESSURES.
3. DETAILED DESIGN COMPUTATIONS.
4. THE PLANS SHALL BE PREPARED, STAMPED AND SIGNED BY A NEW HAMPSHIRE LICENSED PROFESSIONAL ENGINEER.

RETAINING WALL SYSTEM

PART 1.0 – GENERAL

1.1 THIS WORK SHALL CONSIST OF FURNISHING ALL COMPONENTS AND ERECTING A RETAINING WALL SYSTEM IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN CLOSE CONFORMITY WITH THE LINES, GRADES, DESIGN AND DIMENSIONS SHOWN ON THE PLANS OR AS ORDERED.

1.2 THIS FOLLOWING TYPE OF RETAINING WALL SYSTEMS ARE ACCEPTABLE TO BE USED ON THIS PROJECT:
REDI-ROCK (603) 428-3218
SHEA WALL SYSTEMS (800) 696-7432

1.3 STRUCTURAL AND GEOTECHNICAL DESIGN REQUIREMENTS
A. THE DESIGN OF THE WALL SYSTEM SHALL BE BY THE MANUFACTURER.
B. MINIMUM SAFETY FACTORS SHALL BE AS FOLLOWS:
   1. OVERTURNING: 2.0
   2. BASE SLIDING: 1.5
   3. GLOBAL STABILITY: 1.3
   4. GRID PULLOUT:
C. ALLOWABLE NET BEARING PRESSURE = 6 KIPS PER SQUARE FOOT MOIST SOIL UNIT WEIGHT = 125 POUNDS PER CUBIC FOOT
FRICTION ANGLE = 32 DEGREES
D. DESIGN LOADING SHALL CONSIDER SEISMIC LOADS IN ACCORDANCE WITH THE NEW HAMPSHIRE STATE BUILDING CODE.

NOT FOR CONSTRUCTION FOR PERMIT USE ONLY

CITY OF DOVER
PLANNING BOARD FILE#
P18-____

CIVILWORKS NEW ENGLAND
CIVIL ENGINEERING
181 Watson Road, P.O. Box 1166
Dover, New Hampshire 03820
(603) 749-0443

NO.	REVISION	APP'D	DATE

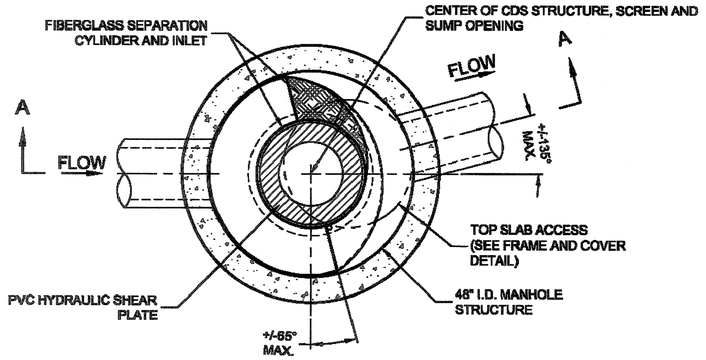
DATE: 7-18-18
SCALE: 1"=30'
DRAWN BY: SRD
DESIGN BY: MMR
APPROVED BY:SJH
PROJECT NO:1795
FILE: SITE.DWG

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

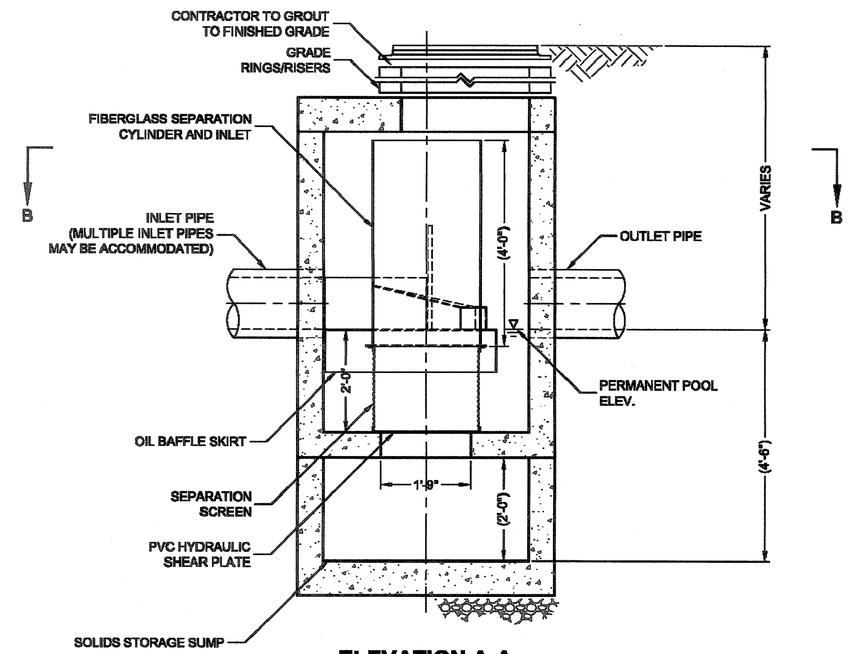
COCHECO LANDING
DOVER, NH

DETAIL SHEET

17



PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.

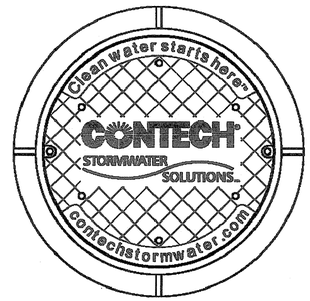
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 6,284,652; 6,641,720; 6,811,696; 6,998,038; AND RELATED FOREIGN PATENTS. OTHER PATENTS PENDING.

CDS2015-4-C DESIGN NOTES

CDS2015-4-C RATED TREATMENT CAPACITY IS 1.4 CFS, OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY IS 10.0 CFS. IF THE SITE CONDITIONS EXCEED 10.0 CFS, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

THE STANDARD CDS2015-4-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS)	*
PEAK FLOW RATE (CFS)	*
RETURN PERIOD OF PEAK FLOW (YRS)	*
SCREEN APERTURE (2400 OR 4700)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH CONSTRUCTION PRODUCTS REPRESENTATIVE. www.contech-cpi.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET AASHTO M306 LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
1. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
2. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
3. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
4. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
5. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH® CONSTRUCTION PRODUCTS INC.
www.contech-cpi.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS2015-4-C
CDS INLINE
STANDARD DETAIL

USE IN CATCH BASINS PCB1 & PCB2

C:\DOCUMENTS AND SETTINGS\JGREENLEAF\LOCAL SETTINGS\TEMPORARY INTERNET FILES\CONTENT.OUTLOOK\S5A0WH1V\CDS2015-4-C-DTL.DWG 10/29/2010 10:58 AM

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CIVILWORKS NEW ENGLAND
CIVIL ENGINEERING
181 Watson Road, P.O. Box 1166
Dover, New Hampshire 03820
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NO.	REVISION	APP'D	DATE

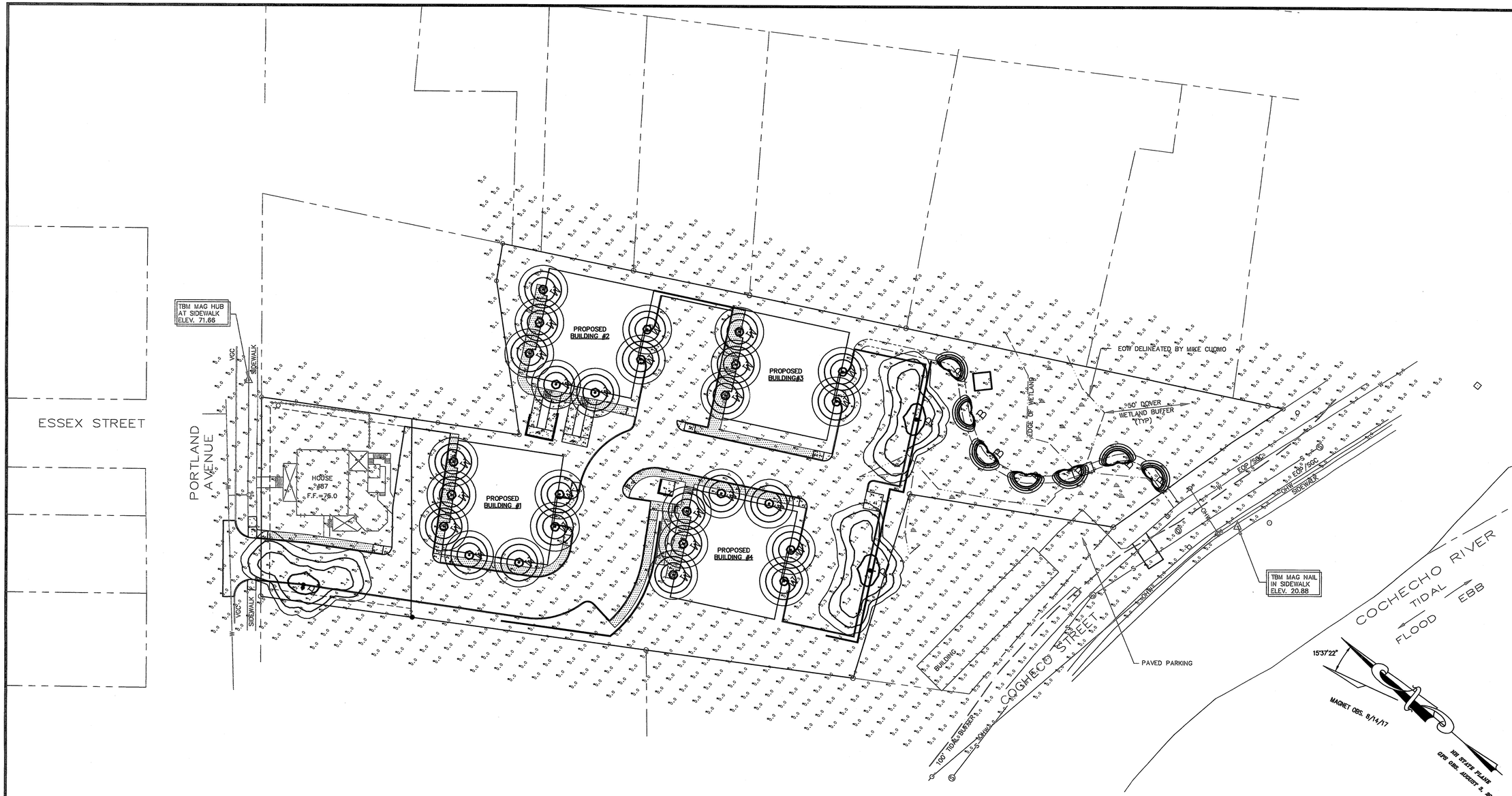
DATE: 7-18-18
SCALE: 1"=30'
DRAWN BY: SRD
DESIGN BY: MMR
APPROVED BY:SJH
PROJECT NO:1795
FILE: SITE.DWG

DETAIL SHEET

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

COCHECO LANDING
DOVER, NH

18



Luminaire Schedule				
Symbol	Qty	Label	Arrangement	Description
⊙	7	B	SINGLE	99857 / 99622 (39 INCH AFG)
⊸●	3	P	SINGLE	77911/ 1108HR (12' POLE)
⊸●	26	W	SINGLE	66411 / WALL MTD 9' AFG

StatArea_1
PAVED AREAS
Illuminance (Fc)
Average = 0.35
Maximum = 2.7
Minimum = 0.0
Avg/Min Ratio = N.A.
Max/Min Ratio = N.A.

NOTES:
1. PHOTOMETRIC PERFORMED BY CHARRON INC.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

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CITY OF DOVER
PLANNING BOARD FILE#
P18-___

CIVILWORKS NEW ENGLAND
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Dover, New Hampshire 03820
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NO.	REVISION	APP'D	DATE

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SCALE: 1"=30'
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DESIGN BY: MMR
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PROJECT NO:1795
FILE:SITE.DWG

LIGHTING PLAN

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

COCHECO LANDING
DOVER, NH

19

Pole top luminaires with asymmetrical light distribution

Type:
BEGA Product:
Project:
Voltage:
Color:
Options:
Modified:

Housing: Two interlocking die-cast aluminum housings. Heavy gauge .093" spun aluminum shade with rolled edge, finished white inside. Die castings are marine grade, copper free (≤ 0.3% copper content) A360.0 aluminum alloy.

Arm: Fabricated from .125" wall aluminum extrusion formed into a continuous smooth radius, terminating and welded into a one piece die-cast aluminum fitter. Fitter slip fits a 3" O.D. pole top and is secured by six (6) socket head stainless steel set screws threaded into stainless steel inserts.

Enclosure: Lamp enclosure/optical system comprises an assembly of two pure anodized aluminum asymmetrical main beam reflectors with clear impact-resistant acrylic lens with optical texture fixed to a heavy gauge .050" spun aluminum shade with rolled edge, finished white inside and rigidly fastened to the luminaire housing. Fasteners are stainless steel.

Electrical: 42.6W LED luminaire, 48 total system watts, -30°C start temperature. Integral 120V through 277V electronic LED driver located in luminaire head, 0-10V dimming. Standard LED color temperature is 4000K with a >80 CRI. Available in 3000K (>80 CRI); add suffix K3 to order.

Note: Due to the dynamic nature of LED technology, LED luminaire data on this sheet is subject to change at the discretion of BEGA-US. For the most current technical data, please refer to www.bega-us.com.

Finish: All BEGA standard finishes are polyester powder coat with minimum 3 mil thickness. Available in four standard BEGA colors: Black (BLK); White (WHT); Bronze (BRZ); Silver (SLV). To specify, add appropriate suffix to catalog number. Custom colors supplied on special order.

UL listed for US and Canadian Standards, suitable for wet locations. Protection class: IP65.

Weight: 27.6 lbs.

Effective Projection Area (EPA): 2.8 ft²

Luminaire Lumens: 2548
Tested in accordance with LM-79-08





Single post-top luminaires

	Lamp	LEED	A	B	C
77911	42.6W LED	LZ-2	26⅛	46¾	40⅛

Recommended for use with 14' to 18' poles.

Wall luminaires with shielded light

Type:
BEGA Product:
Project:
Voltage:
Color:
Options:
Modified:

Housing: Two piece die-cast aluminum with extruded aluminum arm and die-cast canopy supplied with a universal mounting bracket for direct attachment to a 3½" or 4" octagonal wiring box. A die-cast aluminum round "rotation" plate allows the housing to be precisely leveled (or rotated) after installation. Die castings are marine grade, copper free (≤ 0.3% copper content) A360.0 aluminum alloy.

Enclosure: Handblown, seamless, three-ply opal glass (≥ 75% transmissive) with screw neck. Molded high temperature silicone rubber O-ring gasket for weather tight operation. Spun aluminum shade with rolled reinforced edge, painted white inside.

Electrical: 8.9W LED luminaire, 12 total system watts, -30°C start temperature. Integral 120V through 277V electronic LED driver, 0-10V dimming. LED module(s) are available from factory for easy replacement. Standard LED color temperature is 3000K with an 80 CRI. Available in 4000K (80 CRI); add suffix K4 to order.

Note: LEDs supplied with luminaire. Due to the dynamic nature of LED technology, LED luminaire data on this sheet is subject to change at the discretion of BEGA-US. For the most current technical data, please refer to www.bega-us.com.

Finish: All BEGA standard finishes are polyester powder coat with minimum 3 mil thickness. Available in four standard BEGA colors: Black (BLK); White (WHT); Bronze (BRZ); Silver (SLV). To specify, add appropriate suffix to catalog number. Custom colors supplied on special order.

CSA certified to U.S. and Canadian standards, suitable for wet locations. Protection class IP44

Weight: 4.0 lbs

Luminaire Lumens: 724





Lamp		A	B	C	D
08411	8.9W LED	12⅛	14½	13½	4½

Type:
Project:
Options:
Modified:
Luminaire:
Fixture EPA:
Optional Tenon: ☐ 2⅜"ϕ x 3½" H
GCO: ☐
GFI: ☐

Approval:

1108HR 3" - 5" Tapered round hinged pole

Shaft: Extruded from all new seamless 6063 aluminum alloy tubing, heat treated to a T-6 condition.

Anchor base: Round cast aluminum A356 alloy, heat treated to a T-6 condition. Anchor base and shaft continuously welded at the outside top and inside bottom of the anchor base casting. Pole base to be round hinged two piece casting. Hinge Pole shaft to be welded to upper base casting which is secured to lower base casting by three (3) stainless steel bolts. Bolts to be fastened to cast-in stainless threaded inserts in lower casting. Cast round two piece base cover supplied with pole.

Anchor bolts: Four (4) ¾" x 17" galvanized steel anchor bolts supplied with double nuts and flat washers. Maximum bolt projection 3½". For luminaires requiring threaded inserts and pole cap -specify: 1D (single); 2D (@ 180°); 3D (@ @ 120°).

GCO or GFI: Standard GCO/GFI location is opposite the hinge. Height above base for ballast in luminaires is 18". For single luminaires with a pole base mounted (PBM) ballast the minimum height is 24" and 42" minimum for double PBM luminaires.

Weight: 50.0 lbs.

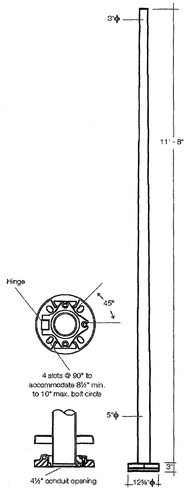
Disclaimer

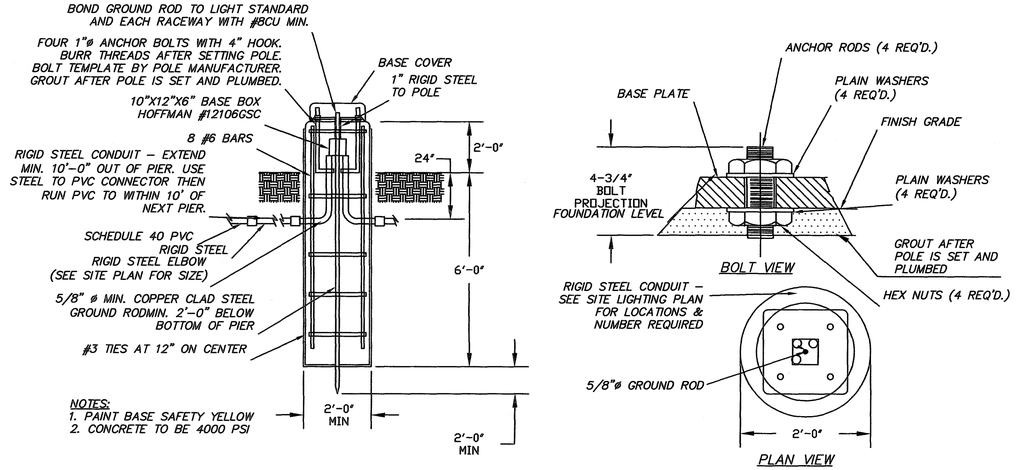
BEGA-US warrants the specific anchor bolts and pole combination according to the product number(s) and description(s) indicated on this submittal sheet. Structural changes to the pole requested by the customer, including changes to pole length, may affect the compatibility of the anchor bolts and corresponding poles. BEGA-US is not responsible for the incompatibility of the anchor bolts and poles resulting from such structural changes without review by the BEGA-US engineering department. This includes, but is not limited to, any labor charges, charges for replacement materials and shipping.

Pole wind load rating:

MPH:	70	80	90	100	120
EPA:	15.5	11.5	8.7	6.8	4.4

Note: Data above assumes grade level installation and a maximum luminaire weight of 50 lbs.





LIGHT POLE BASE

NOT TO SCALE

BEGA LED system bollard - luminaire head with unshielded light with safety guard - 180°

Type:
BEGA Product:
Project:
Voltage:
Color:
Options:
Modified:

Enclosure: Housing constructed of die-cast aluminum. Die-castings are marine grade, copper free (≤ 0.3% copper content) A360.0 aluminum alloy. Glass diffuser, inside white. Fully gasketed for weather tight operation using molded silicone gasket.

Installation: BEGA LED system bollards are designed for easy attachment to system bollard tube using an internal locking stainless steel mechanism and stainless steel set screw threaded into stainless steel insert. An accompanying bollard tube must be selected for proper installation, see below chart for compatible tube options.

Electrical: 18.5W LED luminaire, 19.8 total system watts, -30°C start temperature. Integral 120V through 277V electronic LED driver, 0-10V dimming. LED module(s) are available from factory for easy replacement. Standard LED color temperature is 3000K with a >80 CRI. Available in 4000K (>80 CRI); add suffix K4 to order.

Note: LEDs supplied with luminaire. Due to the dynamic nature of LED technology, LED luminaire data on this sheet is subject to change at the discretion of BEGA-US. For the most current technical data, please refer to www.bega-us.com.

Finish: All BEGA standard finishes are polyester powder coat with minimum 3 mil thickness. Available in four standard BEGA colors: Black (BLK); White (WHT); Bronze (BRZ); Silver (SLV). To specify, add appropriate suffix to catalog number. Custom colors supplied on special order.

CSA certified to U.S. and Canadian standards, suitable for wet locations. Protection class IP65

Luminaire Lumens: 1638

Bollard heads - shielded with reflector - 180°

Lamp		A	B
99857	18.5 W LED	7¼	7¼

Bollard tubes for luminaire heights 19¾" - 21¾"

		A	B	Ampa. std.
99616		7¼	14¼	79817

Bollard tubes for luminaire heights 31¼" - 39¼"

	Integrated components	Bezel	A	B	Ampa. std.
99622	—	✔	7¼	32	79816
99644	1 LED floodlight 13.5W	✔	7¼	32	79816
99636	GFCI outlet	✔	7¼	32	79816
99656	Passive infrared motion sensor	✔	7¼	32	79816
99635	Emergency lighting battery 10W	✔	7¼	32	79816



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CITY OF DOVER
PLANNING BOARD FILE# P18-___

CIVILWORKS NEW ENGLAND
CIVIL ENGINEERING
181 Watson Road, P.O. Box 1166
Dover, New Hampshire 03820
(603) 749-0443

NO.	REVISION	APP'D	DATE

DATE: 7-18-18
SCALE: 1"=30'
DRAWN BY: SRD
DESIGN BY: MMR
APPROVED BY:S.H
PROJECT NO:1795
FILE: SITE.DWG

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

COCHECO LANDING
DOVER, NH

LIGHTING DETAILS



0 5 10 20 40

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181 Watson Road, P.O. Box 1165
Dover, New Hampshire 03820
(603) 749-0443

NO.	REVISION	APP'D	DATE

DATE: 07/16/18
SCALE: 1"=20'
DRAWN BY: VM
DESIGN BY: VM
APPROVED BY:RW
PROJECT NO:1795
FILE:SITE.DWG

woodburn &company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

LANDSCAPE CONCEPT PLAN

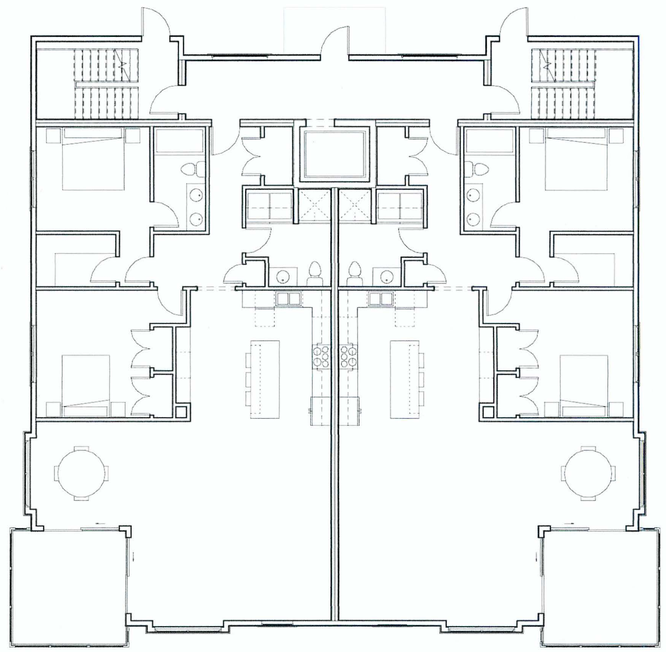
MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

COCHECO LANDING
DOVER, NH

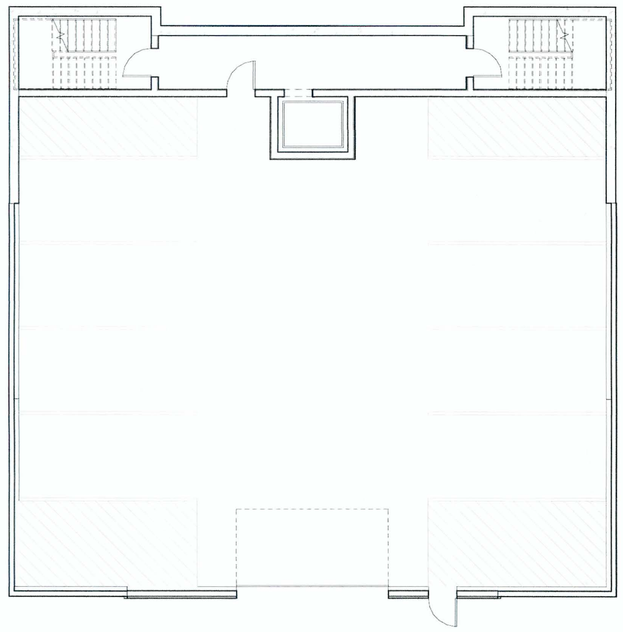
L–1



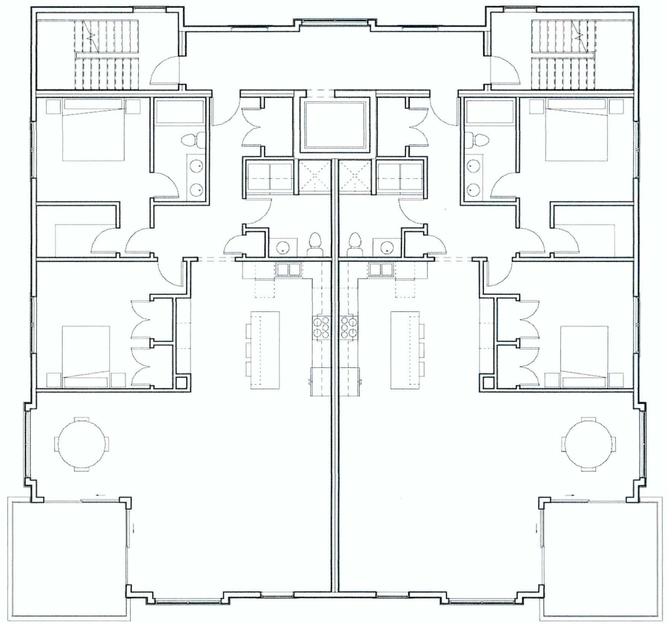
COCHECO LANDING VIEW LOOKING NORTH



2 FIRST FLOOR PLAN
1/8" = 1'-0"



1 GARAGE LEVEL
1/8" = 1'-0"



3 SECOND THRU FOURTH FLOOR PLANS
1/8" = 1'-0"

PRELIMINARY

REVISIONS:

#	DATE	DESCRIPTION

COCHECO LANDING

87 PORTLAND AVENUE
DOVER, NEW HAMPSHIRE

CJ ARCHITECTS
233 VAUGHAN ST - PORTSMOUTH - NH - 03801
603 431 2808

RENDERING
&
FLOOR PLANS

DATE:	07/24/18
DRAWN BY:	RLD
APPROVED BY:	CJG
SCALE:	1/8" = 1'-0"
JOB NUMBER:	21801

A1



1 BUILDING 1 SOUTH ELEVATION
1/8" = 1'-0"



2 BUILDING 1 EAST ELEVATION
1/8" = 1'-0"



3 BUILDING 1 NORTH ELEVATION
1/8" = 1'-0"



4 BUILDING 1 WEST ELEVATION
1/8" = 1'-0"

PRELIMINARY

REVISIONS:

#	DATE	DESCRIPTION

COCHECO LANDING

87 PORTLAND AVE
DOVER, NEW HAMPSHIRE

CJ ARCHITECTS
233 VAUGHAN ST - PORTSMOUTH - NH - 03801
603 431 - 2808

BUILDING #1
ELEVATIONS

DATE:	7/24/2018
DRAWN BY:	RLD
APPROVED BY:	CJG
SCALE:	1/8" = 1'-0"
JOB NUMBER:	21801

A2



1 BUILDING 2 SOUTH ELEVATION
1/8" = 1'-0"



AVERAGE GRADE PLANE

2 BUILDING 2 EAST ELEVATION
1/8" = 1'-0"



3 BUILDING 2 NORTH ELEVATION
1/8" = 1'-0"



AVERAGE GRADE PLANE

4 BUILDING 2 WEST ELEVATION
1/8" = 1'-0"

PRELIMINARY

REVISIONS:

#	DATE	DESCRIPTION

COCHECO LANDING

87 PORTLAND AVE
DOVER, NEW HAMPSHIRE

CJ ARCHITECTS
233 VAUGHAN ST - PORTSMOUTH - NH - 03801
603 - 431 - 2808

BUILDING #2
ELEVATIONS

DATE:	7/24/2018
DRAWN BY:	RLD
APPROVED BY:	CJG
SCALE:	1/8" = 1'-0"
JOB NUMBER:	21801

A3



1 BUILDING 3 SOUTH ELEVATION
1/8" = 1'-0"



AVERAGE GRADE PLANE

2 BUILDING 3 EAST ELEVATION
1/8" = 1'-0"



AVERAGE GRADE PLANE

3 BUILDING 3 NORTH ELEVATION
1/8" = 1'-0"



4 BUILDING 3 WEST ELEVATION
1/8" = 1'-0"

PRELIMINARY

REVISIONS:

#	DATE	DESCRIPTION

COCHECO LANDING

87 PORTLAND AVE
DOVER, NEW HAMPSHIRE

CJ ARCHITECTS
233 VAUGHAN ST - PORTSMOUTH - NH - 03801
603 - 431 - 2808

BUILDING #3
ELEVATIONS

DATE:	7/24/2018
DRAWN BY:	RLD
APPROVED BY:	CJG
SCALE:	1/8" = 1'-0"
JOB NUMBER:	21801

A4



1 BUILDING 4 SOUTH ELEVATION
1/8" = 1'-0"

AVERAGE GRADE PLANE



2 BUILDING 4 EAST ELEVATION
1/8" = 1'-0"



3 BUILDING 4 NORTH ELEVATION
1/8" = 1'-0"

AVERAGE GRADE PLANE



4 BUILDING 4 WEST ELEVATION
1/8" = 1'-0"

PRELIMINARY

REVISIONS:

#	DATE	DESCRIPTION

COCHECO LANDING
87 PORTLAND AVE
DOVER, NEW HAMPSHIRE

CJ ARCHITECTS
233 VAUGHAN ST - PORTSMOUTH - NH - 03801
603 431 - 2808

BUILDING #4
ELEVATIONS

DATE:	7/24/2018
DRAWN BY:	RLD
APPROVED BY:	CJG
SCALE:	1/8" = 1'-0"
JOB NUMBER:	21801

A5



PORTLAND AVENUE - STREET VIEW



PORTLAND AVENUE - DRIVEWAY STREET VIEW



COCHECO STREET - STREET VIEW

REVISIONS:

#	DATE	DESCRIPTION

COCHECO LANDING

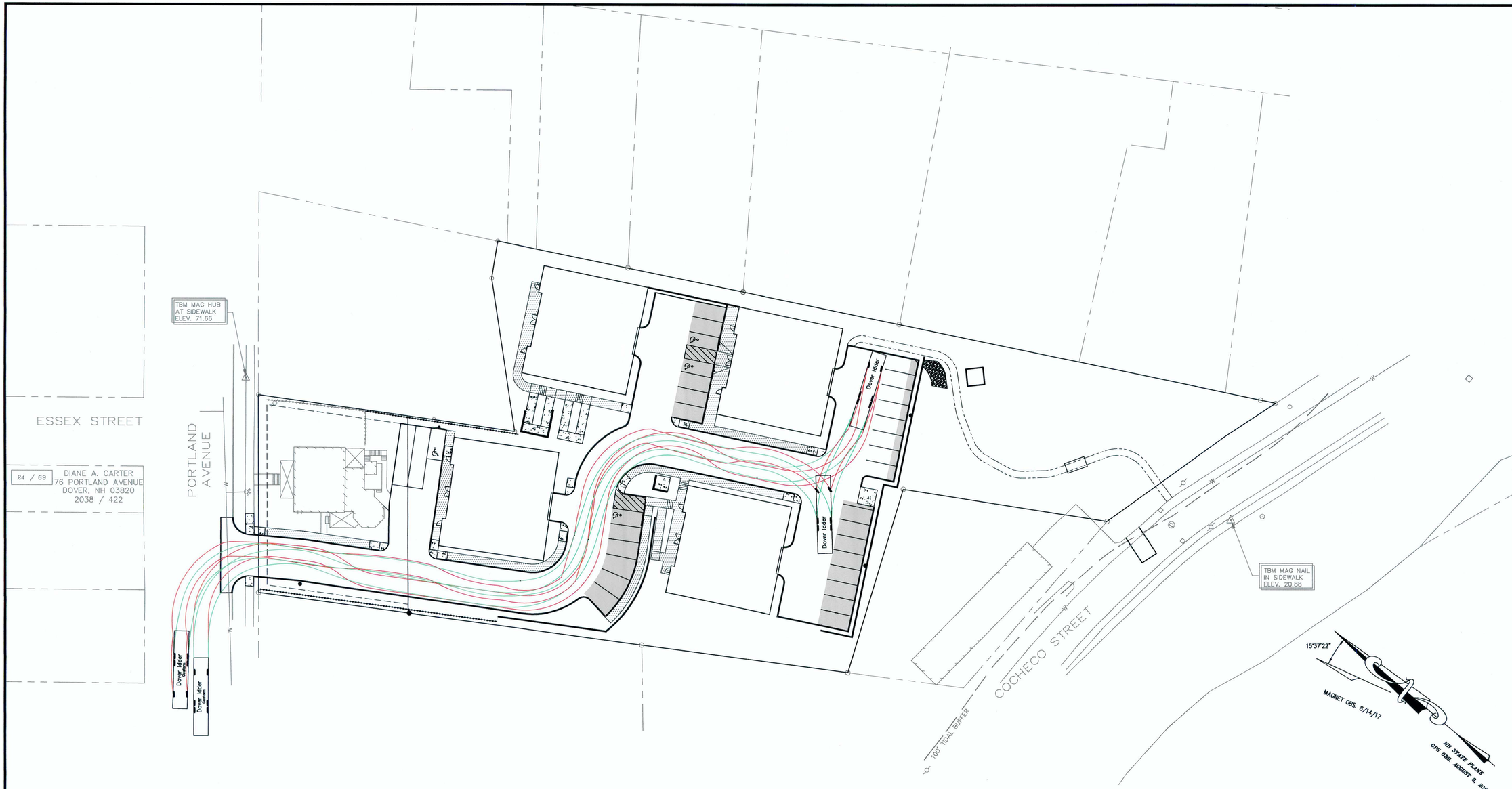
87 PORTLAND AVE
DOVER, NEW HAMPSHIRE

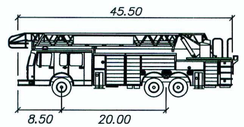
CJ ARCHITECTS
233 VAUGHAN ST - PORTSMOUTH - NH - 03801
603-431-2808

PORTLAND AVENUE AND COCHECO STREET VIEWS

DATE:	7/24/2018
DRAWN BY:	RLD
APPROVED BY:	CJG
SCALE:	1/8" = 1'-0"
JOB NUMBER:	21801

A6





Dover Idder	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.0

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

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CITY OF DOVER
PLANNING BOARD FILE#
P18-____

CIVILWORKS NEW ENGLAND
CIVIL ENGINEERING
181 Watson Road, P.O. Box 1166
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(603) 749-0433

NO.	REVISION	APP'D	DATE

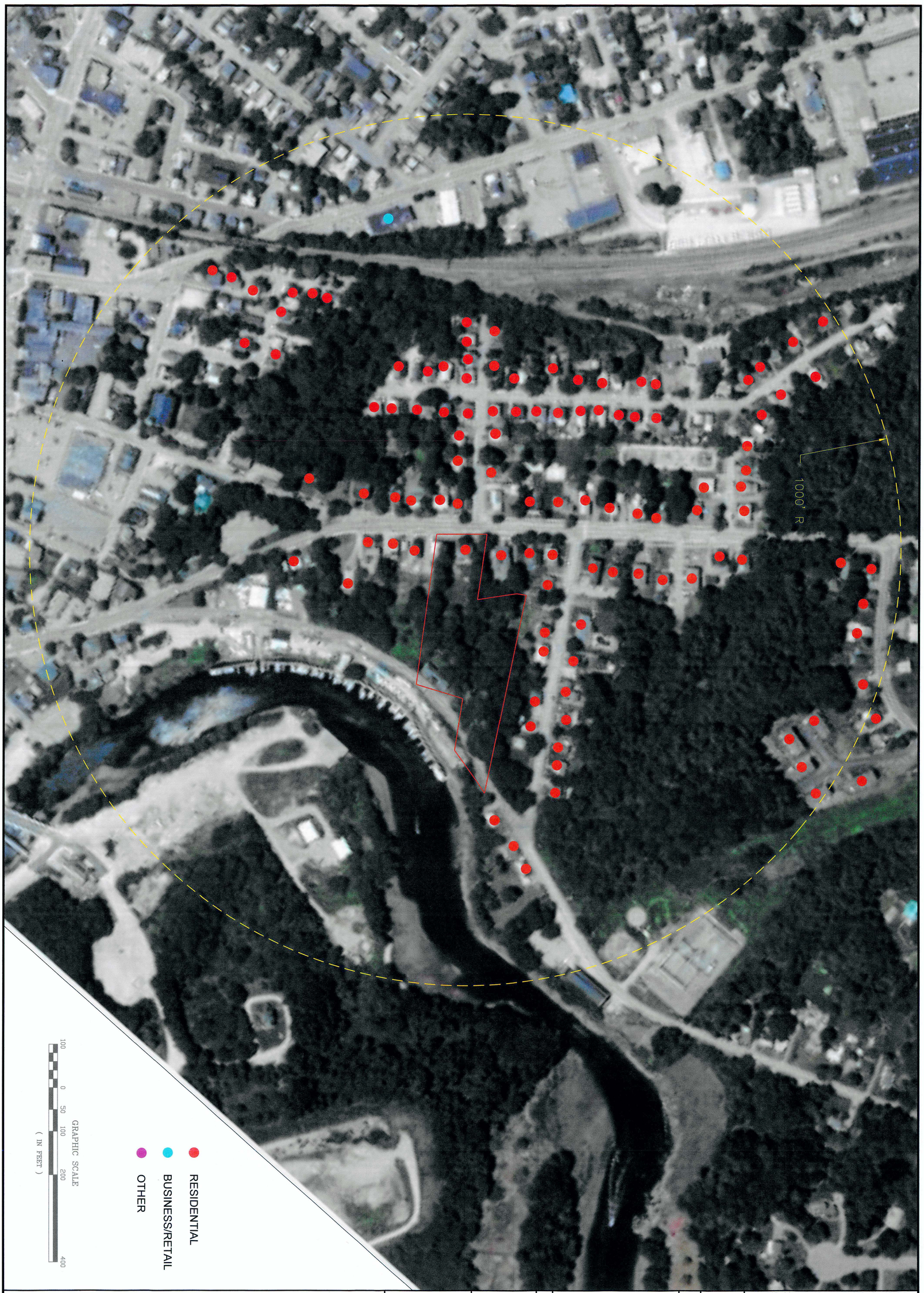
DATE: 7-18-18
SCALE: 1"=30'
DRAWN BY: SRD
DESIGN BY: MMR
APPROVED BY:SJH
PROJECT NO:1795
FILE: SITE.DWG

DOVER FIRE TRUCK MOVEMENT PLAN

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVENUE
DOVER, NH 03820

COCHECO LANDING
DOVER, NH

1 OF 1



NEIGHBORHOOD PLAN

1 OF 1

COCHECO LANDING
PORTLAND AVE &
COCHECO ST.
DOVER, NH

MARKER 44 HOLDINGS, LLC
130 CENTRAL AVE
DOVER, NH 03820

DATE: XXX				
SCALE: XX				
DRAWN BY: XX				
DESIGN BY: XX				
APPROVED BY:XX				
PROJECT NO: XX				
FILE: XXX	NO.	REVISION	APP'D	DATE

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