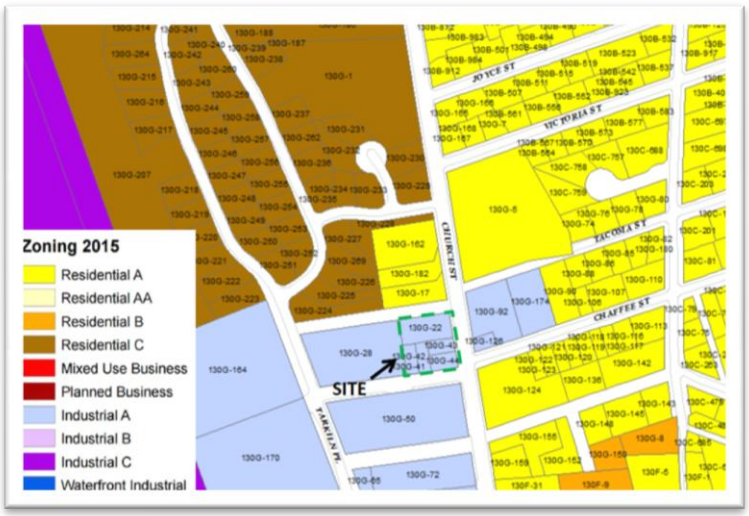
City of New Bedford
Department of Planning, Housing & Community Development
608 Pleasant St, New Bedford, Massachusetts 02740
Telephone: (508) 979.1500 Facsimile: (508) 979.1575

PATRICK J. SULLIVAN
DIRECTOR

STAFF REPORT

PLANNING BOARD MEETING
March 8, 2017

Case # 02-17: **SITE PLAN REVIEW**
NW corner of Church
and Chaffee Streets
Map: 130G-1, f/k/a Lots: 22, 41-44



Applicant's Agent: Boucher & Heureux, Inc
648 American Legion Hwy, Ste. 1
Westport, MA 02790

Applicant: Marcio Silva
78 Moorings Road
Marion, MA 02719

Owners: Jose J. & Marian F. Silva
12 Balsam Street
Fairhaven, MA 02719

Overview of Request
This is a request by applicant for Site Plan approval under Chapter 9 Comprehensive Zoning §5400 for new construction of the 5,200+/- SF Xcel Brazilian Jiu Jitsu Gymnasium located at the NW corner of Church and Chaffee Streets (Map 130G-1, formerly known as Lots 22 and 41-44) on a 27,871 SF site in the Industrial A (IA) zoning district.

A plan of land under the ANR (Approval Not Required) process, merging lots 22 and 41-44 into one parcel, has been prepared and recorded for the applicant by Prime Engineering (P.O. Box 1088, 350 Bedford Street, Lakeville, MA 02347).

Under this proposal for construction, *Health Clubs* are permitted by right in the Industrial A zoning district. As there is an overlap in the commonly accepted definition of *health club* and definition of *gymnasium*, the Zoning Enforcement Officer considers this use, a gymnasium, relative to the by-right use as a physical training and health maintenance facility.

Existing Conditions
The construction area is located on relatively flat, unimproved land of grass and brush, south of Whaler's Woods Estates at the west side of Church Street between Chaffee Street and the paper street known as Tacoma Street. A second ingress/egress to Whaler's Woods Estates exists via the extension of Tarkiln Place (formerly known as Watson Place) which intersects at Chaffee Street. Traffic entering and leaving both local industrial properties and a residential subdivision is directed from Chaffee Street to and from the Church Street collector road at the subject site.

In addition to the newer subdivision, surrounding context is comprised of unimproved land at the northeast and southeast corners of Church and Chaffee Street. Regal House Furniture and Mattress Store is located at the southwest corner of Chaffee and Church Street directly across from the subject site; it appears shipping and receiving is from the north side of the furniture store at Chaffee Street. Interstate Equipment Rental & Sales abuts the proposed development and is surrounded by chain link and barb wire fencing with one curb cut at Chaffee Street. Other business entities operate within the immediate area.

Proposed Conditions
The applicant intends to erect a 5,200+/- SF prefab metal structure, with a maximum height at 16.54+/- feet, to be served by 30 associated off-street parking spaces, two (2) handicap spaces, and one (1) loading zone on an undeveloped lot located at the northwest corner of Church and Chaffee Streets. Under 521 CMR: Architectural Access Board standards, two (2) ADA compliant spaces are required for 26-50 parking spaces. The applicant exceeds the municipal code requirement of 26 required parking spaces for this use.

Appendix C-Table of Parking & Loading Regulations

USE	PARKING REQUIREMENTS	LOADING REQUIREMENTS
Places of assembly, including theaters, veterans, fraternal, social and recreational clubs and organizations not operated for a profit; facilities primarily for the education and instruction of persons sixteen (16) yrs. of age and older; taxi, bus & railroad passenger terminals; auditoriums, theaters, bowling alleys and dance halls; **sports facilities**; places of worship; funeral homes	One (1) space per five (5) seats for which the building is designed or **one (1) spaces for each 200 sq. ft. of gross floor area whichever results in the greatest number.**	One (1) loading space for each building containing 10,000 sq. ft. or more of gross floor area. Two (2) loading spaces for buildings containing 100,000 sq. ft. or more of gross floor area.

Demand and Operations

Customers, clients and staff will enter and exit the commercial premises via Chaffee Street. The applicant anticipates one (1) employee will staff the facility to serve 30 patrons per day, operating between the hours of 11:00 a.m.-8:00 p.m. Monday thru Saturday. Deliveries are anticipated to arrive once a week at approximately 11:00 a.m.

Public utility service is available at the street.

The applicant states 31.5% of the developed site will remain as green space, exceeding the current ordinance threshold of 20% Green Space in the IA zoning district. The buffer zone of old growth trees at the Tacoma Street alignment in the adjacent RC zoning district is of benefit as this offers additional Green Space in proximity to the site development; this vegetated buffer should be preserved.

Review of the Drainage Stormwater Analysis Report submitted as a part of this application finds stormwater run-off from the proposed building roof will be directed to two (2) separate infiltration systems; access driveways and parking areas will be directed to two (2) Stormceptors that will provide water quality treatment prior to discharging to two (2) infiltration systems to provide retention, water quality, and recharge to the groundwater. The engineer's report further concludes, "This design consideration will insure recharge to the maximum extent practicable and no net increase in runoff from that of existing conditions for the 2 yr, 10 and 25 yr storm events."

The Board may wish to inquire as to the project schedule as it has not been disclosed as stipulated under §5452.

Site Plan Review

Plans submitted for consideration:

The submittal is shown as Xcel Brazilian Jiu Jitsu, Map 103G-1, Formerly Lots 22, 41-44, New Bedford, MA prepared for Marcio Silva, dated January 23, 2017, prepared by Boucher & Heureux, Inc., 648 American Legion Highway, Ste. One, Westport, MA 02790 [consisting of three (3) pages]

- **Layout & Landscape Plan**
- **Grading & Utilities Plan**
- **Details & Notes**

And

Approval Not Required Plan in New Bedford, MA for Jose J. & Maria F. Silva, dated January 18, 2017 as revised thru February 8, 2017, prepared by Prime Engineering, P.O. Box 1088, 350 Bedford Street, Lakeville, MA 02347.

And

Floor Plan & Elevations for Silva's Gym, Church Street, New Bedford, MA dated 07/01/2016, prepared by Cape Building Systems, Inc., 13 Industrial Drive, Mattapoisett, MA 02739. (See comments under **Building Elevations.)**

Drainage Stormwater Analysis Report-Prepared for Marcio Silva by Gustavo O. Raposo, P.E. , Raposo Engineering Consulting, LLC, 411 Gulf Road West, Dartmouth, MA, signed January 24, 2017.

- Staff recommends all references to "Hay/Hay bale" be revised to stipulate "Straw/Straw bale".

Staff Comments:

- A **Cover Sheet,** as stipulated on *Site Plan Review Checklist,* has been omitted.
  - Revision Block is omitted on plan sheets.
  - Deed Book & Page are omitted on plan sheets.
  - Zoning District is omitted from plan sheets.

- Address of property owner has been omitted from plan sheets.
- Zoning Requirements Table – omitted.
- Plan Index-omitted.

☐ **Existing Conditions Plan,** as stipulated on *Site Plan Review Checklist*
- This plan is referenced as the ANR Plan prepared by Prime Engineering.
- Date of Survey is omitted.
- It is assumed this is not a 21E site.
- It is assumed there are no utility easements on site.
- Test Pits are omitted.

☐ **Demolition Plan**-N/A no demolition at site

☐ **Construction / Layout Plan,** as stipulated on *Site Plan Review Checklist* (Applicant has combined Layout and Landscape plan)
- Number of Stories has been omitted.
- There is an overhead door shown on the Elevation drawing sheet No. A-1.1 at the north elevation that is not illustrated on the layout plan.
- Pavement type is not noted on plan.
- It is assumed lighting is wall pack. Staff recommends that applicant provide cut sheets for review and approval by Planning Board or City Planner.
- Sign and Sign Schedule are omitted. Staff recommends that applicant provide plans & specs for review and approval by Planning Board or City Planner.
- Staff recommends an added note: Any minor modifications (as determined by the City Planner and City Engineer) to the information shown on the approved site plans shall be submitted to the City Planner and City Engineer as a Minor Plan Revision for approval prior to the work being performed.
- Staff recommends an added note: All erosion control measures shall be in place prior to construction. Erosion Control shall conform to the City of New Bedford Conservation Commission requirements as stated in the Order of Conditions.

☐ **Grading and Drainage Plan,** as stipulated on *Site Plan Review Checklist* (Applicant has combined **Grading, Drainage, Utility** plan)

☐ **Utility and Grading Plan,** as stipulated on *Site Plan Review Checklist* (Applicant has combined **Grading, Drainage, Utility** plan)
- Add Note: The contractor shall obtain a Street Disturbance & Obstruction Permit prior to any construction within the right-of-way
- Add Note: All water and sewer material and construction shall conform to the City of New Bedford requirements
- Add Note: All water and sewer construction shall be inspected by the City Of New Bedford before being backfilled
- Add Note: The City shall be notified at least 24 hours prior to the required inspections

☐ **Landscape Plan,** as stipulated on *Site Plan Review Checklist* (Applicant has combined Layout and Landscape plan)
- Landscape details omitted. The Planning Board will require a Landscape Plan and planting schedule, as stipulated under Municipal Code (Section 5451.e.)
- The Period of Planting shall be noted on the plan as: March 15-May 15 and September 15-November 15, weather permitting.

- Note location, species & size of all proposed plantings
- Trees shall be 2-2.5 inch caliper diameter at the three foot rise, or from the top of the burlap and ball
- Note all existing landscaping to be removed or retained
- Delineate & label all existing and proposed groundcovers, lawn areas, driveways, walkways, patios and other surface treatments
- Identify Snow storage area
- Note proposed irrigation methods (on-site wells to be used unless otherwise approved)
- Verify sight distances at entrances

☐ **Erosion Control Plan**, as stipulated on *Site Plan Review Checklist* (Applicant has referenced this plan in the **Drainage Stormwater Analysis Report)**

☐ **Floor Plan**, as stipulated on *Site Plan Review Checklist* (Applicant has provided)

☐ **Building Elevations**, as stipulated on *Site Plan Review Checklist*
- Show all structural building elevations (front, sides and rear façades)
- Identify/provide all existing and proposed exterior materials, treatments and colors- including roofing, roof eaves, eave brackets, siding, doors, trim, sills, windows, fences, and railings.
- Show/provide details of proposed new exterior elements
- Show any exterior mechanical, duct work, and/or utility boxes

☐ **Sign Plan**, as stipulated on *Site Plan Review Checklist* (See also §3251)
- Provide fully-dimensioned color elevations for all proposed signs
- Show total square footage of proposed signs
- Show proposed sign locations on site plan
- Show proposed materials and methods of lighting for all signs

☐ **Lighting Plan**, as stipulated on *Site Plan Review Checklist*
- Location and orientation of all existing and proposed exterior lighting, including building and ground lighting and emergency spot lighting (if any)
- Height and initial foot-candle readings on the ground and the types of fixtures to be used
- Plan Must Show Illumination Patterns On-Site and Areas Off-Site
- New Bedford Washingtonian Type Fixtures Should Be Used, Where Applicable
- Provide Cut Sheet for All Lighting Fixtures

☐ **Detail Sheet**, as stipulated on *Site Plan Review Checklist* (Details shown; may be amended by the Department of Public Infrastructure)

Review Comments

As required under city ordinance, the case submittal documents were distributed to City Clerk, City Solicitor, Health Department, Inspectional Services, Engineering, Public Infrastructure, Conservation Commission, Fire Department and School Department.

For comments from the Department of Public Infrastructure please see Attachment 8.
No additional comments were received.

Traffic Impact & Access Study

The applicant has not provided a traffic analysis for the proposed development.

Ground Sign Review

The applicant is not submitting an application for Ground Sign at this time. Under the current zoning ordinance should the applicant seek to erect a freestanding sign ("ground sign") on the property a separate site plan approval would be necessary.

Master Plan Goal

The proposal for Site Plan Approval is consistent with the master plan's goal to expand workforce opportunities and communicates a positive message for business development.

Staff Recommendation

Having reviewed this request, the existing character of surrounding properties and the thresholds required for site plan review, staff recommends approval of the application with the following conditions:

1. That the applicant revises plans to incorporate staff comments as noted under the **Site Plan Review/Staff Comments** section of this report and resubmit them to Planning.
2. That the construction project schedule be included with plan revisions when submitted.
3. That site lighting will be turned on no earlier than one hour before the open of business and turned off no later than one hour after the close of business.

Attachments:

1. Narrative
2. Site Plan Review Application
3. Deed
4. ANR Plan - Bristol County (S.D) Registry of Deeds Book 175, Page 49
5. Elevation Drawing
6. Plan Set
7. Drainage Stormwater Analysis Report
8. Memorandum from the Department of Public Infrastructure Dated February 21, 2017

PROJECT NARRATIVE

XCEL BRAZILIAN JIU JITSU GYMNASIUM

Prepared for Marcio Silva

Prepared by Boucher & Heureux, Inc.

January 23, 2017

The project consists of a proposed 5,200 SF gymnasium with associated off-street parking, grading, utilities & landscape trees on a vacant, 27,871 SF commercial lot at the northwesterly corner of Church & Chaffee Streets in New Bedford, MA (see Approval Not Required Plan, prepared by Prime Engineering, dated 1/18/17). A Layout & Landscape Plan, Grading & Utilities Plan and Details & Notes (3 sheets), prepared by Boucher & Heureux, Inc., dated 1/23/17 have been submitted to the Planning Division with the application for Site Plan Review. The building will be a metal space building (see Floor Plan & Elevations, prepared by Cape Building Systems, Inc., dated 7/1/16). There are no wetland areas on or within 100 feet of the property. The land slopes moderately in a northeasterly direction toward Church Street. The site is served by municipal water & sewer as well as gas, electric, telephone & CATV utilities.

The proposed entrance to the off-street parking facility is located in Chaffee Street as far away from the intersection of Chaffee & Church Streets as possible. 30 parking spaces, including the required two handicap spaces, plus a loading space are proposed in accordance with the zoning requirement for the gymnasium use. A sidewalk is proposed around the building for patrons and along the westerly side of Church Street across the frontage of the lot. Also, a granite curb and street trees are proposed across the frontage of the lot in Church Street. The travel aisle width and size of the parking spaces are in compliance with City standards. Access for fire and emergency vehicles is provided on three sides of the building.

Storm water runoff from the parking area is directed into two water quality catch basins and then, into infiltration systems to recharge groundwater and attenuate storm events (see Storm Water Management Report, prepared by Raposa Engineering Consulting, LLC, dated 1/23/17). Roof runoff is directed into these two infiltration systems that overflow to an outlet control structure and connection to a drain pipe in Church Street. All construction activities will incorporate sedimentation and erosion control measures to protect adjacent streets and properties. A stone construction entrance/exit will be constructed at the proposed entrance. Silt fence will be installed downgradient from the proposed work and silt sacks shall be placed around the two catch basin grates during construction, until the landscape areas on the site are stabilized.

ATTACHMENT 1

CITY CLERKS OFFICE
NEW BEDFORD, MA

PLANNING BOARD

2017 FEB -6 P 2:17

CITY CLERK

SUBMIT TO:
Planning Department
133 William Street
Room 303
New Bedford, MA 0274

CITY OF NEW BEDFORD
JONATHAN F. MITCHELL, MAYOR

SITE PLAN REVIEW APPLICATION

The undersigned, being the Applicant, seeks Site Plan Approval for property depicted on a plan entitled: Xcel Brazilian Jiu Jitsu by: Boucher & Heureux, Inc. dated: 1/20/17

1. Application Information

Street Address: Chaffee & Church Street

Assessor's Map(s): 130G-1 Lot(s) 22, 41, 42, 43 & 44

Registry of Deeds Book: 9036 Page: 79

Zoning District: Industrial A

Applicant's Name (printed): Marcio Silva

Mailing Address: 78 Moorings Road (Street) Marion (City) MA (State) 02738 (Zip)

Contact Information: _____
Telephone Number Email Address

Applicant's Relationship to Property: ☑ Owner ☐ Contract Vendee ☐ Other _____

List all submitted materials (include document titles & volume numbers where applicable) below:

Layout & Landscape Plan 1/23/17, Grading & Utilities Plan 1/23/17, Details & Notes 1/23/17, Storm Water Management Report 1/23/17

By signing below, I/we acknowledge that all information presented herein is true to the best of my/our knowledge. I/we further understand that any false information intentionally provided or omitted is grounds for the revocation of the approval (s). I/we also give Planning Department staff and Planning Board Members the right to access the premises (both interior and exterior) at reasonable times and upon reasonable notice for the purpose of taking photographs and conducting other visual inspections.

3-2-2017
Date

Signature of Applicant

PLANNING
FEB 06 2017
DEPARTMENT

Rear Setback (ft)			26
Lot Coverage by Buildings (% of Lot Area)	0		18.6
Permeable Open Space (% of Lot Area)	100		31.5
Green Space (% of Lot Area)	100		31.5
Off-Street Parking Spaces	0		32
Long-Term Bicycle Parking Spaces	0		0
Short-Term Bicycle Parking Spaces	0		0
Loading Bays	0		1

6. Please complete the following:

	Existing	Proposed
a) Number of customers per day:	0	30
b) Number of employees:	0	1
c) Hours of operation:	0	11am-8pm
d) Days of operation:	0	Mon - Saturday
e) Hours of deliveries:	0	11 am

f) Frequency of deliveries: ☐ Daily ☑ Weekly ☐ Monthly ☐ Other: 1

7. Planning Board Special Permits:

☐ The applicant is also requesting a Special Permit from the Planning Board.

Specify the requested Special Permit(s) below, and set forth within attached Development Impact Statement how the request meets approval criteria listed in §5320 of the zoning code.

_____

_____

_____

8. ZBA Variances and Special Permits:

NOTICE: Checking below does not constitute application for a special permit or a variance. The applicant must also file the proper application form and fee with the Zoning Board of Appeals.

☐ The applicant is also requesting a special permit from the ZBA:

Specify zoning code section & title

_____ _____

_____ _____

☐ The applicant is also requesting a variance from the ZBA:

Specify zoning code section & title

_____ _____

_____ _____

BK 9036 PG 79
05/13/08 11:58 DOC. 11861
Bristol Co. S.D.

The address below is not a part of this conveyance its accuracy has not been verified.

Vacant Lot of Land
West Side of Church Street
New Bedford, Massachusetts

Mail to:

REG OF DEEDS
REG #07
BRISTOL S
05/13/08 11:58AM 01
000000 #3382
FEE $912.00
CASH $912.00

DEED

KNOW ALL MEN BY THESE PRESENTS that, THE DEBROSSE FAMILY LIMITED PARTNERSHIP, a Massachusetts Limited Liability Partnership with its principal place of business at 465 North Front Street, New Bedford, Bristol County, Massachusetts, for consideration paid, and in full consideration of Two Hundred Thousand ($200,000) Dollars grants to JOSE J. SILVA and MARIA F. SILVA as Tenants by the Entirety, having a mailing address of 12 Balsam Street, Fairhaven, Massachusetts, 02719 with QUITCLAIM COVENANTS

the land in New Bedford, Bristol County, Massachusetts, with any buildings thereon, bounded and described as follows:

PARCEL ONE:
Beginning at the southwest corner of land to be conveyed at a point in the north line of Chaffee Street, so-called, which said point is one hundred sixty-five and 48/100 (165.48) feet west of intersection of the west line of Church Street with the north line of Chaffee Street; thence

Northerly	in line of other land now or formerly of John A. Lardner, et al, eighty-five (85) feet; thence turning and running
Easterly	one hundred sixty-three and 95/100 (163.95) feet to the west line of Church Street; thence turning and running
Southerly	eighty-five and 12/100 (85.12) feet to the north line of Chaffee Street; thence turning and running
Westerly	by said Chaffee Street one hundred sixty-five and 48/100 (165.48) feet to the point of beginning.

Containing fifty-one and 44/100 (51.44) square rods, more or less, and being lots numbered 125, 126, 127, and 128 on Plan of Oakland Farms made by Abram Gifford dated June 19, 1914, and recorded in the Bristol County (S.D.) Registry of Deeds in Plan Book 14, Page 31.

PARCEL TWO:
Beginning at the northwesterly corner of the land to be conveyed at a point in the Southerly line of Tacoma Street, said point being One Hundred Sixty-two and 42/100 (162.42) feet distant therein westerly from its intersection with the westerly line of Church Street; thence running

Southerly	eighty-five (85) feet; thence turning and running
Easterly	one hundred sixty-three and 95/100 (163.95) feet to the westerly line of Church Street; thence turning and running
Northerly	in line of last-named street eight-five and 12/100 (85.12) feet to the southerly line of Tacoma Street; thence turning and running
Westerly	in line of said Tacoma Street one hundred sixty-two and 42/100 (162.42) feet to the point of beginning.

Containing fifty and 97/100 (50.97) square rods, more or less, and being lots numbered 129, 130, 131 and 132 on plan of Oakland Farms, New Bedford, Mass., owned by Joseph A. Lardner and Fred J. Bentley, made by Abram Gifford, C. E., recorded in the Bristol County (S.D.) Registry of Deeds in Plan Book 14, Page 31.

For title see deed of Mary W. Debrosse dated December 28, 2000 and recorded in the Bristol County (S.D.) Registry of Deeds in Book 4859, Page 289.

Said premises are conveyed subject to real estate taxes for the current fiscal year, which the Grantee(s), by the acceptance of this deed, hereby assume(s) and agree(s) to pay.

Title not examined.

WITNESS our hands and seals this 12th day of ~~April~~ May 2008

The Debrosse Family Limited

Partnership

By: _____
Edmond T. Debrosse
General Partner

By: _____
Daniel G. Debrosse
General Partner

COMMONWEALTH OF MASSACHUSETTS

Bristol, ss. ~~April~~ May 12, 2008

On this 12th day of May, 2008, before me, the undersigned notary public, personally appeared EDMOND T. DEBROSSE, whose identity was proved to me through [ ] personal knowledge [ ] oath or affirmation of _____ who personally knows the signatory [ ] viewing of the signatory's valid driver's license to be the person whose name is signed on the preceding or attached document, and acknowledged to me that the signatory signed it voluntarily for its stated purpose.

_____
Matthew J. Dauney Notary Public
My Commission Expires: 3/19/2015

MATTHEW J. DOWNEY NOTARY PUBLIC

STATE OF FLORIDA

County of Charlotte 21st April, 2008

On this 21st day of April, 2008, before me, the undersigned notary public, personally appeared DANIEL G. DEBROSSE, whose identity was proved to me through [ ] personal knowledge [ ] oath or affirmation of _____ who personally knows the signatory [✓] viewing of the signatory's valid driver's license to be the person whose name is signed on the preceding or attached document, and acknowledged to me that the signatory signed it voluntarily for its stated purpose.

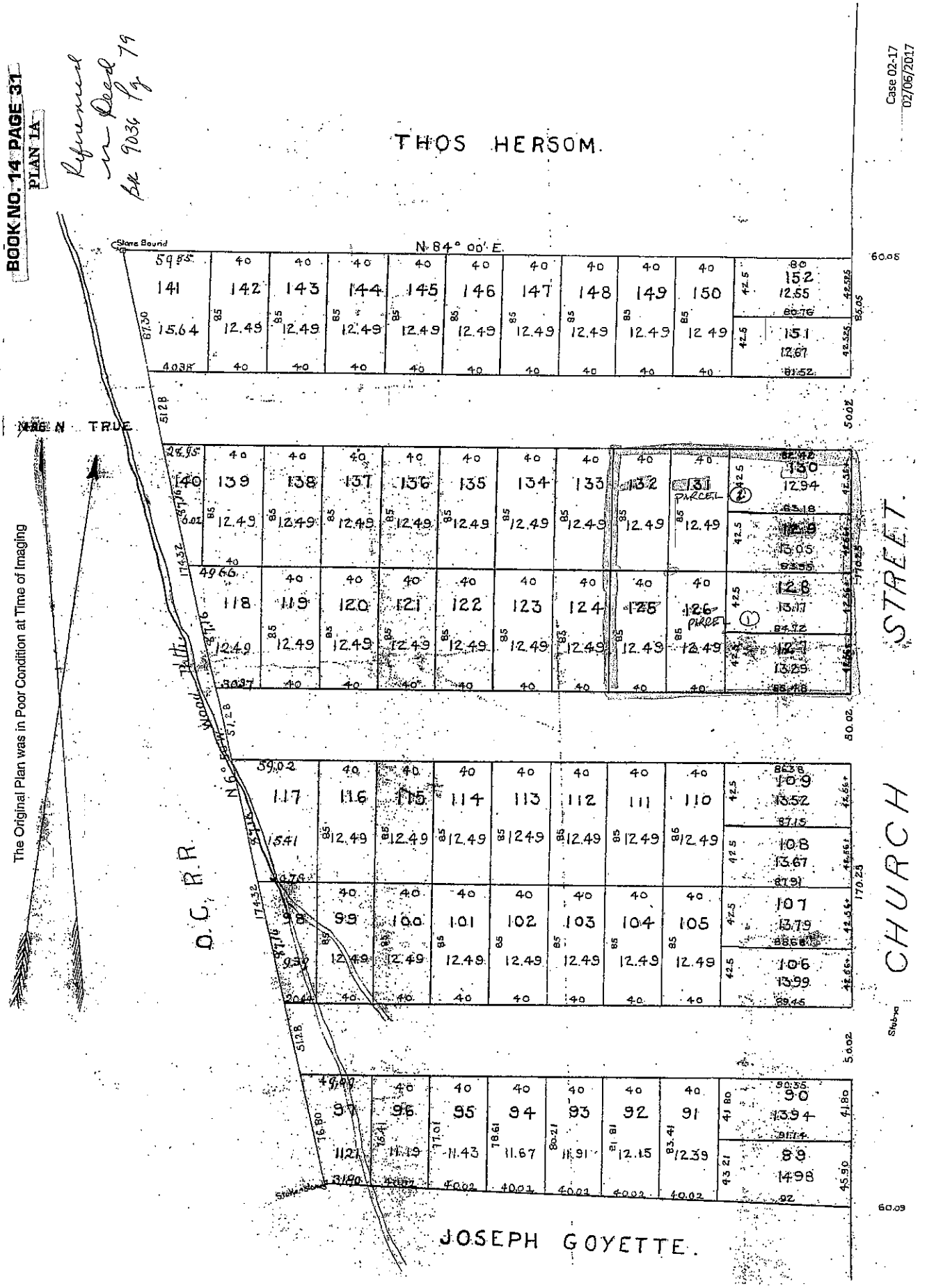
Produced MA Driver's License

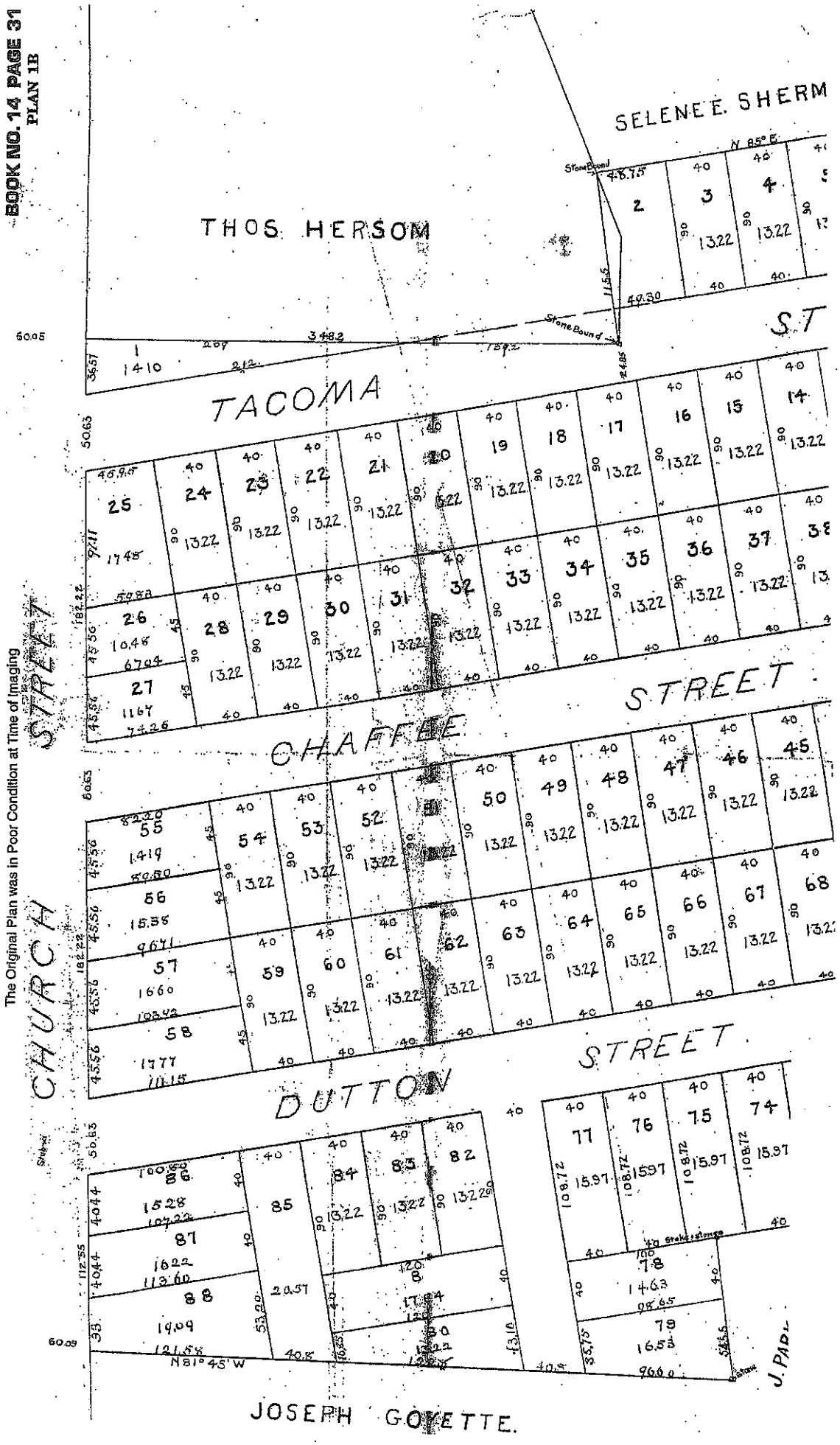
Notary Public

My Commission Expires: 5/11/09

SAISHPATI SUNITA MISIR
NOTARY PUBLIC - STATE OF FLORIDA
COMMISSION # DD428617
EXPIRES 5/11/2009
BONDED THRU 1-888-NOTARY1

Referred in Deed Lr 9036 Fg 79





BOOK NO. 14 PAGE 31
PLAN 10

OAKLAND FARMS

NEW BEDFORD MASS.

PROPERTY OF

JOSEPH A. LARDNER

AND

FRED J. BENTLEY.

Surveyed June 19th 1914.

Scale 1 inch = 50 feet.

ERMAN

STREET

T

WILD-WOOD ROAD

BELLE AIR

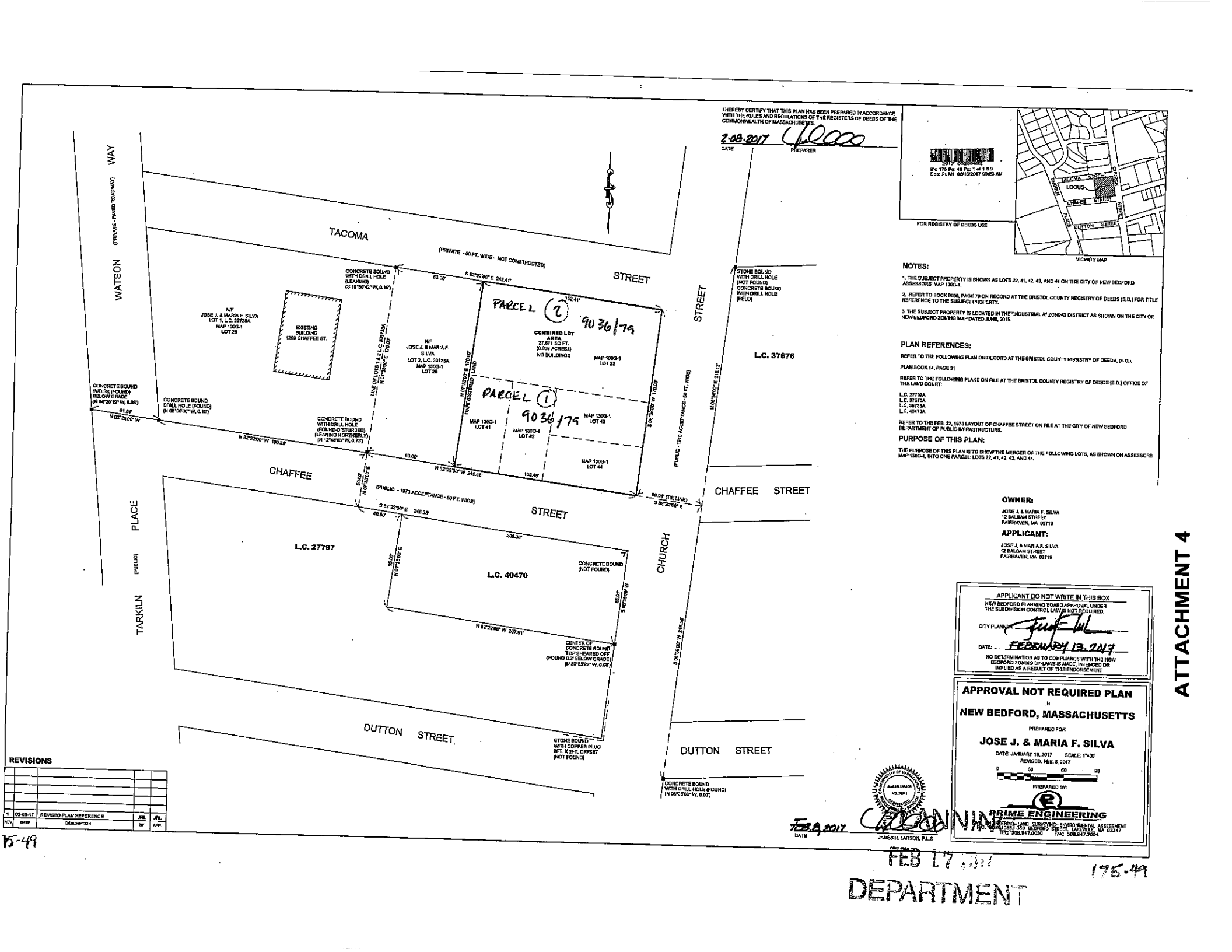
PARK

BELMONT PARK

J. PARKINSON

J. BOLDUC

Abram Gifford Surveyor.



175-49

FEB 17 AM

DEPARTMENT

175-49

ATTACHMENT 4

Case 02-17
02/06/2017

Notes:
1. Ground Snow Load - 30 psf
Basic Wind Speed ---135 mph
Collateral Load ------4 psf
Solar Panel Load ------4 psf
2. Metal Building to be Manufactured by
USA/Owned Structures of America,Inc.)
Houston, TX.

PURPOSE OF OVERHEAD DOOR ?

(ALSO DISCUSSED AT PRELIMINARY MTG)

PLANNING DEPARTMENT
FEB 06 2017

ATTACHMENT 5

SHEET NO. A-1.1	SCALE:	As indicated	SILVA'S GYM CHURCH STREET NEW BEDFORD, MA.	NO.	REVISION	DATE		CAPE BUILDING SYSTEMS, INC.	STAMP
	DATE:	07/01/16							
	DRAWN BY:	JRC							
	APPROVED BY:								
	FLOOR PLAN & ELEVATIONS								

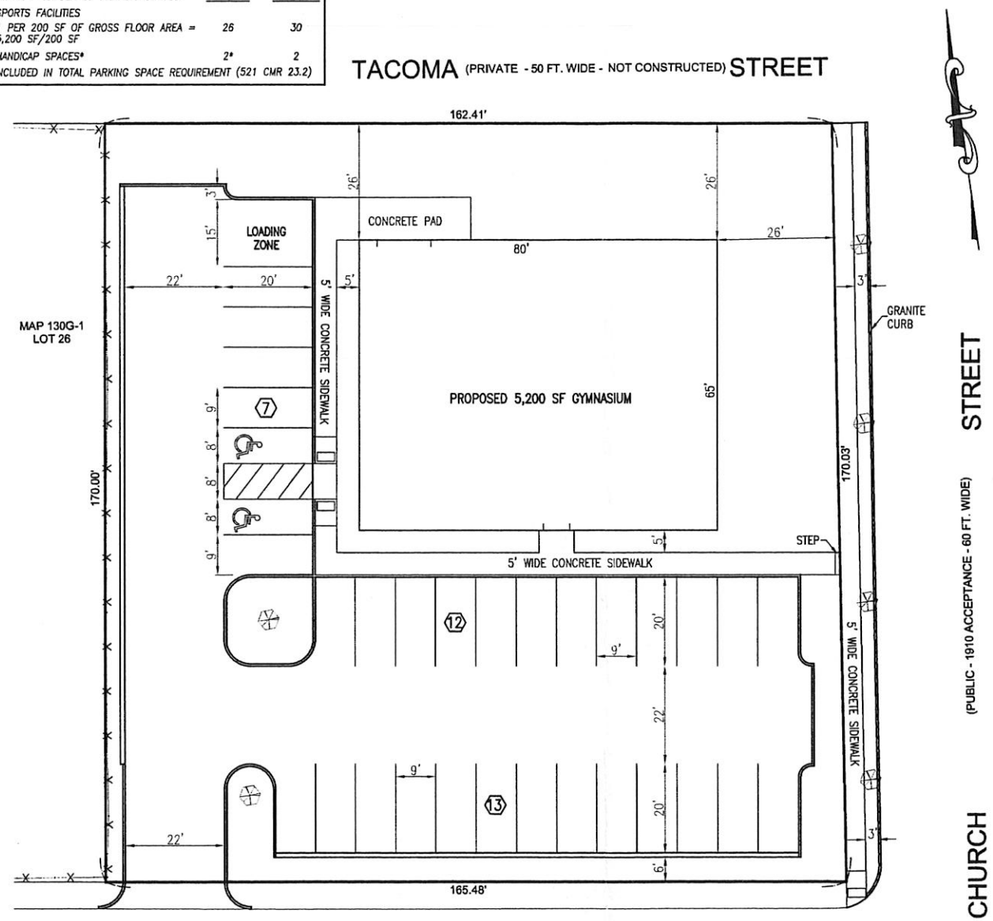
CONSTRUCTION NOTES:

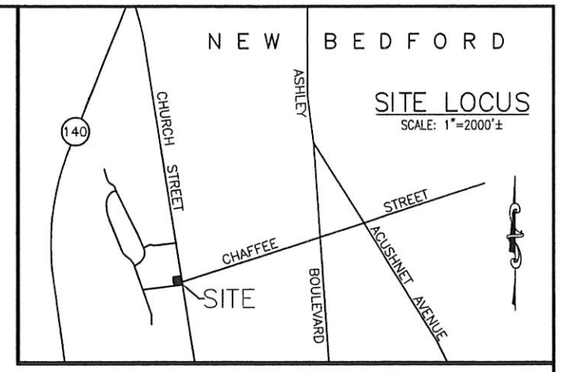
1. CONTRACTORS SHALL BE RESPONSIBLE FOR CONTACTING DIGSAFE AS REQUIRED BY STATE LAW PRIOR TO ANY CONSTRUCTION ACTIVITIES (1-888-DIGSAFE).
2. CONTRACTORS SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION OR CONSTRUCTION ACTIVITIES.
3. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE MASSACHUSETTS HIGHWAY DEPARTMENT & NEW BEDFORD DEPARTMENT OF PUBLIC INFRASTRUCTURE CONSTRUCTION SPECIFICATIONS.
4. PROPOSED CONCRETE SIDEWALK, DRIVEWAY APRONS & CURB RAMPS SHALL BE IN COMPLIANCE WITH CURRENT ADA & CITY STANDARDS. HANDICAP PARKING SHALL BE CLEARLY IDENTIFIED BY A SIGN STATING SAID STALL IS RESERVED FOR PHYSICALLY HANDICAPPED PERSONS.
5. CONTRACTOR SHALL INSTALL A 2 FT X 4 FT YELLOW DETECTABLE WARNING IN COMPLIANCE WITH 28 CFR PART 36, SECTION 4.29 IN THE PROPOSED CURB RAMP IN CHURCH STREET AND AT END OF THE HANDICAP PARKING SPACES..
6. ALL ARTIFICIAL LIGHTING SHALL BE ARRANGED AND SHIELDED SO AS TO PREVENT DIRECT GLARE FROM THE LIGHT SOURCE ONTO ANY PUBLIC WAY OR ANY OTHER PROPERTY. ALL PARKING FACILITIES WHICH ARE USED AT NIGHT SHALL BE LIGHTED AS EVENLY AND FULLY AS POSSIBLE WITHIN THE MAXIMUM WATTAGE LIMITS ESTABLISHED BY THE STATE BUILDING CODE.
7. A PERMIT FOR THE PROPOSED SIDEWALKS, DRIVEWAYS, DRAINAGE AND WATER MUST BE OBTAINED FROM THE DEPARTMENT OF PUBLIC INFRASTRUCTURE – ENGINEERING DIVISION. THE DRIVEWAY PERMITS ARE SUBJECT TO APPROVAL BY THE NEW BEDFORD TRAFFIC COMMISSION. THE APPLICANT SHALL ABIDE BY ALL CONDITIONS OF APPROVAL ISSUED BY THE TRAFFIC COMMISSION.
8. THE ENTRANCE DRIVEWAY IS TO BE BUILT IN ACCORDANCE WITH CITY OF NEW BEDFORD REGULATIONS AND WITH 4 FOOT TRANSITION CURB ON BOTH SIDES.
9. A NEW GRANITE CURB & CONCRETE SIDEWALK SHALL BE INSTALLED ACROSS THE FRONTAGE IN CHURCH STREET.
10. A NEW 1" CURB STOP SHALL BE INSTALLED 1.5 FEET FROM THE PROPERTY LINE IN CHAFFEE STREET.
11. USE STORMCEPTOR MODEL 450i; MANUFACTURED BY RINKER MATERIALS, INC. 69 NECK ROAD WESTFIELD, AM 01085 413-562-3647; OR APPROVED COMPARABLE SUBSTITUTE.
12. THE DEVELOPER'S REPRESENTATIVE AND SITE CONTRACTOR MUST SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE DEPARTMENT OF PUBLIC INFRASTRUCTURE – ENGINEERING DIVISION PRIOR TO THE START OF CONSTRUCTION AND PROVIDE A FULL SET OF THE MOST RECENT VERSION OF THE SITE CONSTRUCTION PLANS.
13. UPON COMPLETION OF THE SITE WORK, THE PROJECT ENGINEER MUST SUBMIT AS-BUILT DRAWINGS IN AUTOCAD FORMAT PRIOR TO CERTIFICATE OF OCCUPANCY BEING ISSUED.

PARKING SPACE REQUIREMENT

MINIMUM NUMBER OF PARKING SPACES:	REQUIRED	PROPOSED
SPORTS FACILITIES		
1 PER 200 SF OF GROSS FLOOR AREA = 5,200 SF/200 SF	26	30
HANDICAP SPACES*	2*	2

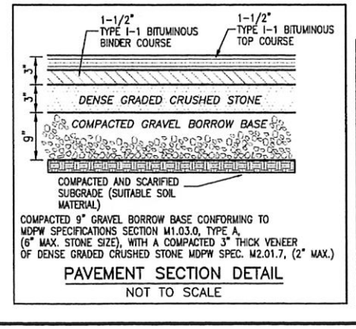
*INCLUDED IN TOTAL PARKING SPACE REQUIREMENT (521 CMR 23.2)



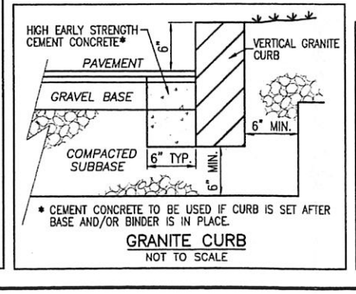


LEGEND

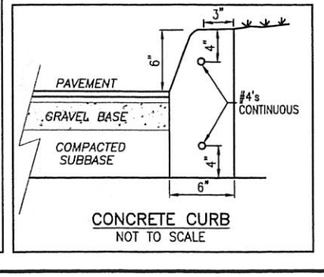
- PROPERTY LINE
- CONCRETE CURB
- GRANITE CURB (IN CHURCH STREET)
- BITUMINOUS CONCRETE BERM
- (12) # OF PARKING SPACES
- HANDICAP PARKING SPACE
- PROPOSED TREE (SEE DETAIL)



PAVEMENT SECTION DETAIL
NOT TO SCALE



GRANITE CURB
NOT TO SCALE



CONCRETE CURB
NOT TO SCALE

20 0 10 20 40
SCALE IN FEET

ALAN J. HEUREUX, P.E. DATE
MA. REG. NO. 33811

LAYOUT & LANDSCAPE PLAN

XCEL BRAZILIAN JIU JITSU
MAP 130G-1, FORMERLY LOTS 22, 41-44
NEW BEDFORD, MASSACHUSETTS
PREPARED FOR
MARCIO SILVA
DATE: JANUARY 23, 2017

PREPARED BY
Boucher & Heureux, Inc.
CIVIL ENGINEERS / LAND SURVEYORS
648 AMERICAN LEGION HIGHWAY, SUITE ONE
WESTPORT, MASSACHUSETTS 02790
tel. (508) 636-5905 – fax. (508) 636-2477

FILE: 3245-01_SP.dwg

ATTACHMENT 6

Case 02-17
02/06/2017

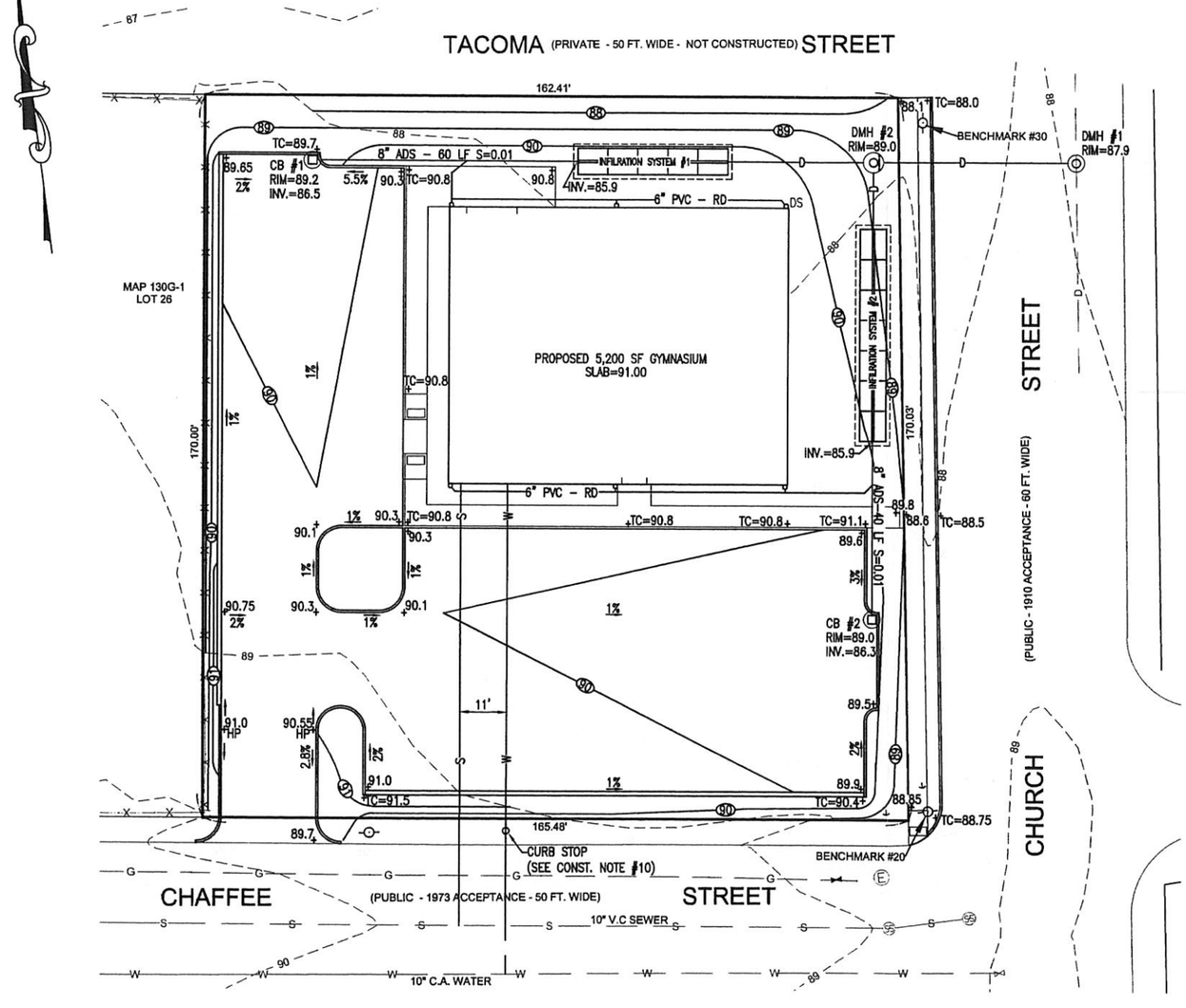
SCHEDULE OF PERIODIC MAINTENANCE AND INSPECTION OF THE PARKING LOT AND CATCH BASINS

1. SWEEP PARKING LOT MONTHLY – MAY THROUGH OCTOBER.
2. REMOVE AND PROPERLY DISPOSE OF ACCUMULATED SEDIMENT, TRASH AND OTHER DEBRIS FROM CATCH BASINS – SPRING AND FALL.

STORM DRAIN STRUCTURE SCHEDULE

STRUCTURE	RIM ELEV.	INV. IN	INV. OUT
DMH#1	87.9 (EXISTING STREET)	84.5 (8"PVC) 83.7 (EX. 18" DRAIN)	83.7 (EXISTING 18"DRAIN)
DMH#2* (OUTLET CONTROL)	89.0	85.90 (8" ADS)	85.0 (8" ADS TO DMH #1) WIER ELEV=87.45
CB#1** (STC-450i)	89.2	–	86.50 (8"ADS TO INFIL. #1)
CB#2** (STC-450i)	89.0	–	86.30 (8"ADS TO INFIL. #2)

* SEE DETAIL SHEET FOR INFORMATION ON THE OUTLET CONTROL STRUCTURE (DMH#2)
** SEE CONSTRUCTION NOTE #11



LEGEND

EXISTING

- PROPERTY LINE
- 100 CONTOUR
- D STORMWATER DRAIN PIPE
- G GAS MAIN
- S SEWER MAIN
- W WATER MAIN
- UP UTILITY POLE

PROPOSED

- 90 CONTOUR
- +91.0 SPOT ELEVATION (PAVEMENT)
- +TC=91.5 TOP OF CURB SPOT ELEV.
- CB1 STORMCEPTOR CATCHBASIN
- DMH1 DRAIN MANHOLE
- D STORM DRAIN PIPE
- RD ROOF DRAIN PIPE
- W 1" COPPER WATER SERVICE
- S 6" PVC BUILDING SEWER

COMMONWEALTH OF MASSACHUSETTS
ALAN J. HEUREUX
CIVIL
No. 33811
REGISTERED PROFESSIONAL ENGINEER

ALAN J. HEUREUX, P.E.
MA. REG. NO. 33811

1/23/17
DATE

GRADING & UTILITIES PLAN

XCEL BRAZILIAN JIU JITSU
MAP 130G–1, FORMERLY LOTS 22, 41–44
NEW BEDFORD, MASSACHUSETTS
PREPARED FOR
MARCIO SILVA
DATE: JANUARY 23, 2017

PREPARED BY
Boucher & Heureux, Inc.
CIVIL ENGINEERS / LAND SURVEYORS
648 AMERICAN LEGION HIGHWAY, SUITE ONE
WESTPORT, MASSACHUSETTS 02790
tel. (508) 636-5905 – fax. (508) 636-2477

FILE: 3245-01_SP.dwg

20 0 10 20 40
SCALE IN FEET

BENCHMARKS (ASSUMED DATUM)

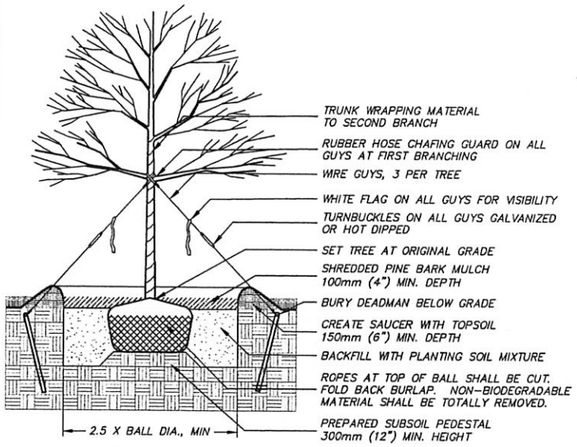
BM #20 – SPIKE IN UTILITY POLE #18
ELEVATION=89.38

BM #30 – SPIKE IN UTILITY POLE LOCATED NEAR NORTHEASTERLY LOCUS CORNER.
ELEVATION=88.81

NOTES:

1. THE EXISTING CONDITIONS SHOWN HEREON ARE TAKEN FROM A PLAN ENTITLED "EXISTING CONDITIONS, CHAFFEE STREET, NEW BEDFORD MA" PREPARED FOR MARCIO SILVA, PREPARED BY PRIME ENGINEERING, INC. DATED 10/18/16.
2. PROPERTY LINES SHOWN HEREON ARE TAKEN FROM A PLAN ENTITLED "APPROVAL NOT REQUIRED PLAN IN NEW BEDFORD MA" PREPARED FOR JOSE & MARIA SILVA, PREPARED BY PRIME ENGINEERING, INC. DATED 01/18/17.

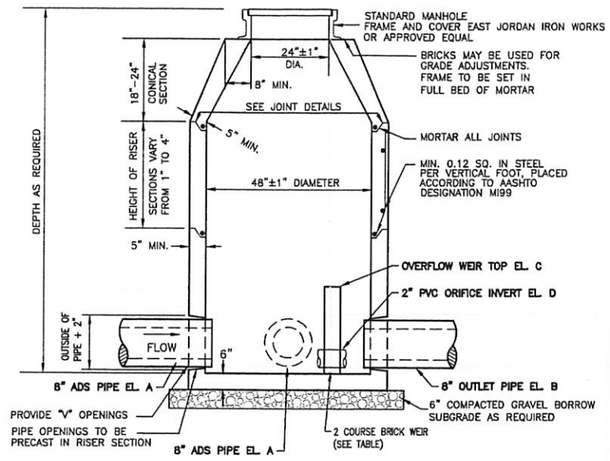
Case 02-17
02/06/2017

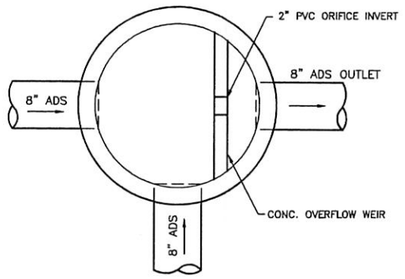


DECIDUOUS TREE PLANTING
NOT TO SCALE

NBDPI APPROVED NEW DEVELOPMENT TREE LIST:

SHORT		
	HAWTHORN	CRATAEGUS CRUSGALLI CRATAEGUS PHAENOPYRUM
	CHERRY	PRUNUS SARGENTII PRUNUS AUTUMNALIS
	HORNBEAM	OSTRYA VIRGINIANA
	LILAC TREE	SYRINGA RETICULATA
TALL		
	MAPLE	ACER RUBRUM ACER SACCHARUM
	HONEY LOCUST	GLEDITSIA TRIACANTHOS
	SWEET GUM	LIQUIDAMBER STYRACIFLUA
	WHITE OAK	QUERCUS BICOLOR
	ELM	ULMUS AMERICANA
	ZELKOVA	ZELKOVA SERRATA



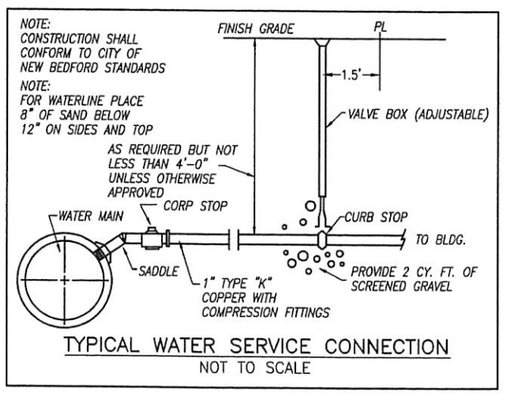


OUTLET CONTROL MANHOLE
ELEVATION TABLE

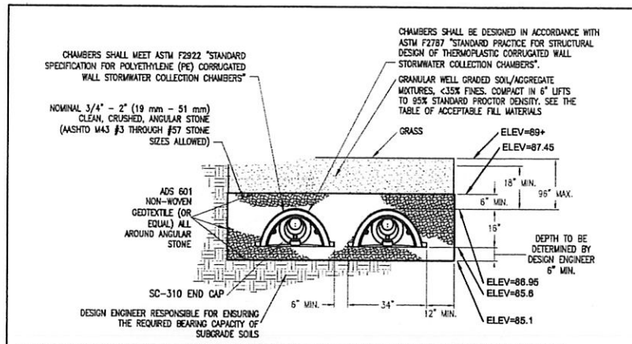
STRUCTURE:	EL. A	EL. B	EL. C	EL. D
OCMH #1	85.90	85.00	87.45	85.90

NOTES:
1. MANHOLE DESIGN TO CONFORM TO ASTM C478 LATEST REVISION.
2. CONCRETE SHALL BE WET CAST 4000 P.S.I. @ 28 DAYS.
3. USE FLAT TOP SLAB WHEN HEIGHT OF CONE SECTION IS LESS THAN 3'-0".
4. FILL OUTSIDE FACE OF ALL MANHOLE JOINTS WITH NON-SHRINK MORTAR.

TYPICAL OUTLET CONTROL STRUCTURE MANHOLE
NOT TO SCALE



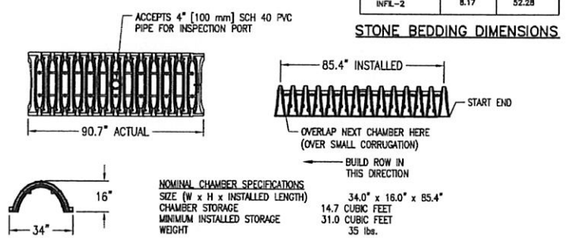
TYPICAL WATER SERVICE CONNECTION
NOT TO SCALE



THE INSTALLED CHAMBER SYSTEM SHALL PROVIDE THE LOAD FACTORS SPECIFIED IN THE AASHTO LFRD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12 FOR EARTH AND LIVE LOADS WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.

SYSTEM	WIDTH FT.	LENGTH FT.
INFIL-1	8.17	38.04
INFIL-2	8.17	52.28

STONE BEDDING DIMENSIONS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W x H x INSTALLED LENGTH)	34.0" x 16.0" x 85.4"
CHAMBER STORAGE	14.7 CUBIC FEET
MINIMUM INSTALLED STORAGE	31.0 CUBIC FEET
WEIGHT	35 lbs.

NOTE: ALL DIMENSIONS ARE NOMINAL

UNDERGROUND RECHARGE SYSTEM
NOT TO SCALE

ALAN J. HEUREUX, P.E.
MA. REG. NO. 33811
DATE

COMMONWEALTH OF MASSACHUSETTS
ALAN J. HEUREUX
CIVIL
No. 33811
REGISTERED PROFESSIONAL ENGINEER

DETAILS & NOTES

XCEL BRAZILIAN JIU JITSU

MAP 130G-1, FORMERLY LOTS 22, 41-44
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR

MARCIO SILVA

DATE: JANUARY 23, 2017

PREPARED BY

Boucher & Heureux, Inc.

CIVIL ENGINEERS / LAND SURVEYORS

648 AMERICAN LEGION HIGHWAY, SUITE ONE
WESTPORT, MASSACHUSETTS 02790
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FILE: 3245-01_SP.dwg

DRAINAGE STORMWATER ANALYSIS REPORT

January 2017

XCEL BRAZILIAN JIU JITSU GYM

Church & Chaffee Street

New Bedford, Massachusetts

Prepared for: *Marcio Silva*

Prepared by: *Gustavo O. Raposo, P.E.*
Raposo Engineering Consulting, LLC
411 Gulf Road West
Dartmouth, Massachusetts
Tel: (508) 999-4681

1-24-17

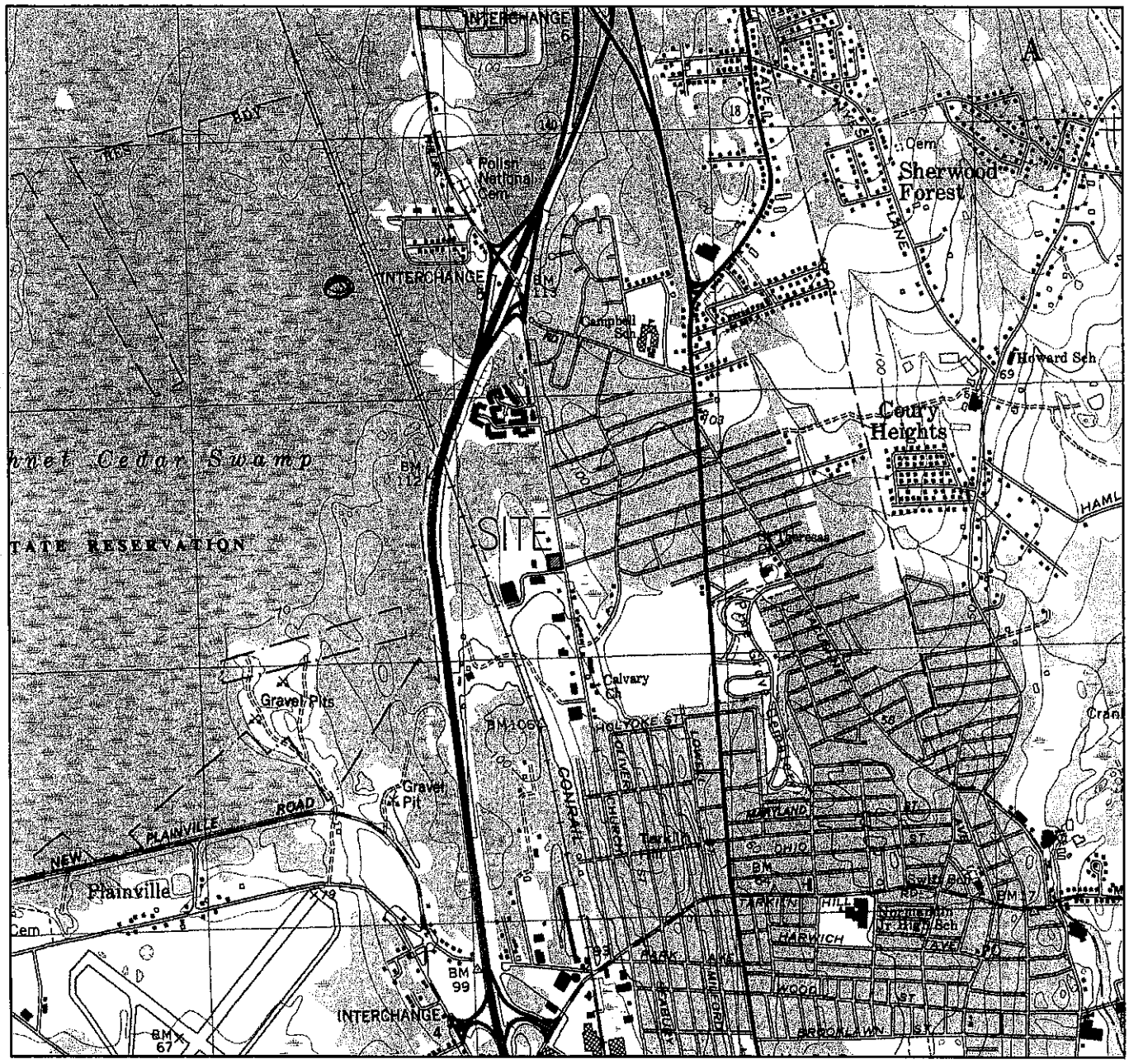
PLANNING
FEB 06 2017
DEPARTMENT

ATTACHMENT 7

Case 02-17
02/06/2017

Table of Contents

APPENDIX



TITLE: Site Locus – U.S. Quadrangle Map

CLIENT: Xcel Brazilian Jiu Jitsu

ADDRESS: New Bedford, Massachusetts

PLAT/LOT: Map 130g–1;
Formerly Lots 22, 41–44

SCALE: 1" = 2000'±

DATE: January 23, 2017

JN: 3245–01

Boucher & Heureux, Inc.

648 American Legion Highway
Westport, MA 02790
(508) 636–5905
Fax (508) 636–2477

Civil Engineers
Environmental Engineers
Land Surveyors
Planners
Scientists

I. INTRODUCTION

This report has been developed to outline and document the proposed project Ecel Brazilian Jiu Jitsu Gym on a vacant lot (MAP 130G-1, Formerly Parcels 22, 41-44) on Church & Chaffee Street, New Bedford Massachusetts.

The project consists of a 5,200 S.F. Gymnasium and associated parking lot. Stormwater runoff from the entire of impervious areas will be collected by the proposed drainage system. Detailed information of the drainage analysis can be found in this report.

All construction activities will incorporate sedimentation and erosion control measures to insure the protection of adjacent properties. These measures at a minimum include limit of work area consisting of Haybales & Silt fence surrounding the down slopes of the project area, stone construction entrance/exit, the placement of Siltsacks at each existing and newly installed catch basin to prevent silt from entering the existing or proposed drainage system. In addition dust control measures will be provided as warranted by field conditions.

II. STORMWATER MANAGEMENT

The proposed stormwater management system is designed to meet the standards of the *Massachusetts Stormwater Management Policy* and *Regulations* for water quality and flood control and does not increase the discharge rate of runoff from existing conditions. Stormwater runoff rates were calculated utilizing HydroCAD 10, a computer aided design program that utilizes the NRCS SCS TR-20 method. The rainfalls amounts for each storm event were taken from the Northeast Regional Climate Center (NRCC) for Extreme Precipitation.

24-Hour Type III Rainfall Amount (inches)

2-YEAR	10-YEAR	25-YEAR
3.35	4.95	6.19

A. PRE-DEVELOPMENT CONDITIONS

The site is located at Church and Chaffee Street, City of New Bedford, Massachusetts. Currently the property is undeveloped. There are no wetlands onsite.

Grades on the site can be characterized as moderate and fall from west to east toward Church Street. The entire property has been identified on the USDA/SCS Soil Survey as Urban Land type "D" soils. Currently there are no measures for stormwater management or water quality on site. The site is served by public water, gas and overhead electric and telephone utilities.

Refer to the "Pre-Development Watershed Plan" attached to the report and HydroCAD modeling calculations for the existing topography, cover descriptions, times of concentration and delineation of drainage area for the Pre-Development conditions. The following descriptions outline the conditions and design parameters of the project model.

Design Point #1

The area discharging to Design Point #1 is indicated as EWS-1 on the Existing Watershed Plan. EWS-1 represents the entire undeveloped area. EWS-1 discharges via overland flow to Church Street, which for the purpose of analysis is noted as DESIGN POINT #1.

DESIGN POINT #1 TOTAL RUNOFF SUMMARY
(EWS-1)

Rainfall Event	Existing Runoff (cfs)
2-year	1.58
10-year	2.50
25-year	4.62

B. POST-DEVELOPMENT CONDITIONS

The project consists of a 5,200 S.F. Building and associated parking lot.
Less than one acre of land is being disturbed.

Stormwater runoff from the proposed building roof is directed to two (2) separate Infiltration Systems, associated access drives and parking areas will be directed to two (2) Stormceptors to provide water quality treatment prior to discharging to two (2) infiltration systems to provide retention, water quality and recharge to groundwater. This design consideration will insure recharge to the maximum extent practicable and no net increase in runoff from that of existing conditions for the 2yr, 10 and 25.yr storm events.

Refer to the "Proposed Watershed Plan" (PWP) attached to the report for the proposed topography, cover descriptions, times of concentration and delineation of drainage sub-areas for the Post-Development conditions. The following paragraphs outline the conditions and design parameters included in the project model.

Refer to the "Post-Development Watershed Plan" attached to the report for the existing/proposed topography, cover descriptions, times of concentration and delineation of drainage sub-areas for the Post-Development conditions.

The Static Method was used for the design of the two(2) Infiltration System and an extremely conservative Infiltration Rate of 0.06 Inches/Hour taken from Table 2.3.3 - Rawls Rates - Massachusetts Stormwater Handbook.

There are five (5) sub-catchment drainage areas:

SC-1: SUBCATCHMENT AREA #1

West Parking Lot:

- Total Area= 5,123 S.F
- Paved= 4,605 S.F.
- Grass Area= 518 S.F.

SC-2: SUBCATCHMENT AREA #2

South Parking Lot:

- Total Area= 9,378 S.F
- Paved= 8,830 S.F.
- Grass Area= 548 S.F.

R-1: HALF OF THE BUILDING ROOF

- Area= 2,600 S.F.

R-2: HALF OF THE BUILDING ROOF

- Area= 2,600 S.F.

UA-1: UNDETAINED AREA

- Total Area= 8,170 S.F
- Paved= 457 S.F.
- Grass Area= 7,713 S.F.

Finally, all construction activities will incorporate sedimentation and erosion control measures to insure protection to the adjacent property. These measures include utilization of existing paved entrances for construction traffic anti-tracking, and the placement of haybales & silt fence along the perimeter of the project area, siltsacks at each existing and proposed catch basin to prevent silt from entering the proposed drainage system and the existing drainage system adjacent to the site. In addition dust control will be provided as warranted by field conditions.

DESIGN POINT #1 (DMH#1)

Rainfall Event	Existing Peak Runoff (cfs)	Proposed Peak Runoff (cfs)
2-year	1.58	1.50
10-year	2.50	2.39
25-year	3.20	3.08

As this table indicates no increases in peak stormwater discharges during each of the design rainfall events are anticipated due to the proposed improvements.

III. CONCLUSION

Based on the HydroCAD analysis for the 2, 10, and 25-year storm events, the peak rate of stormwater runoff flowing off-site has been decreased from the existing to the proposed condition.

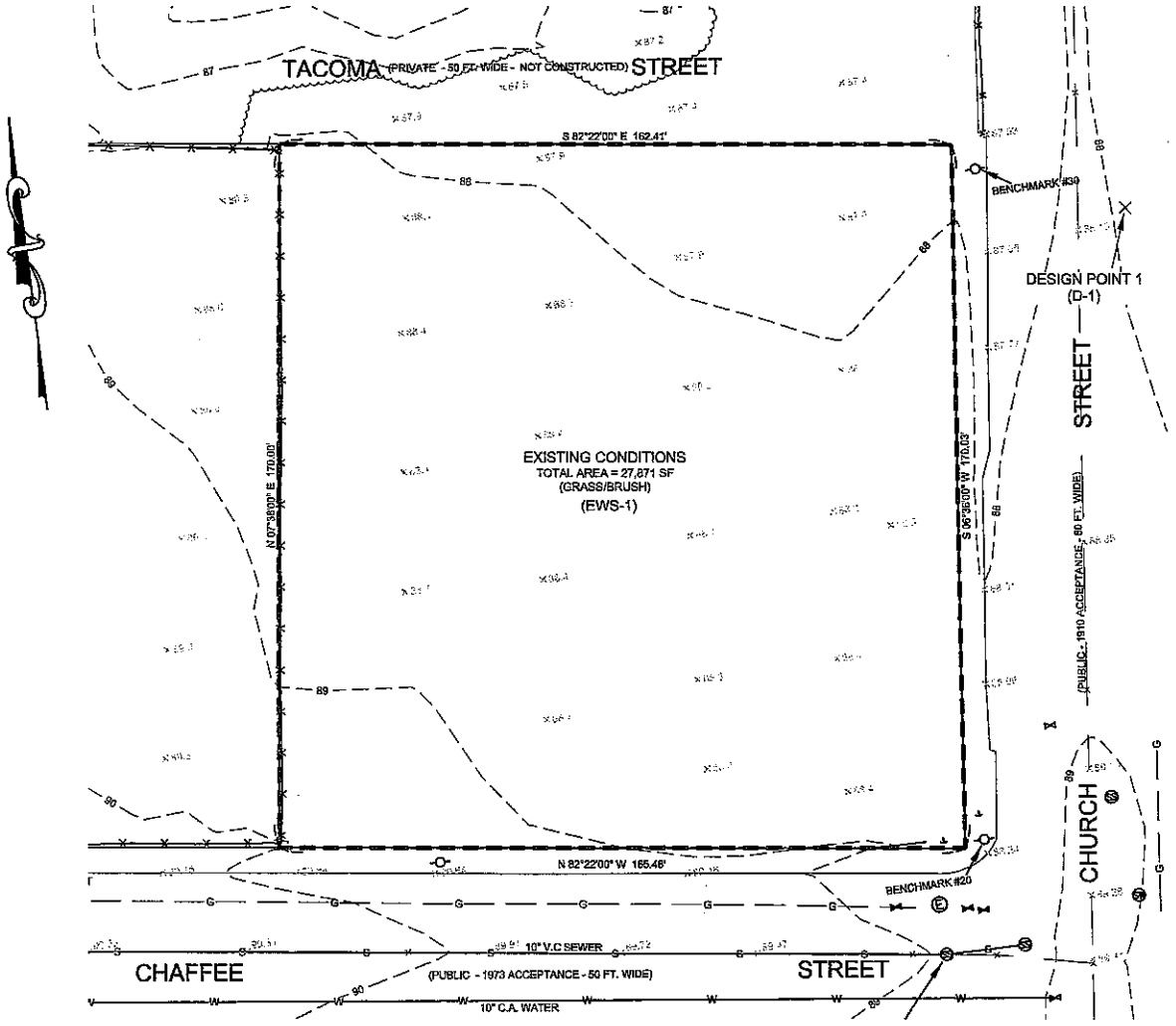
Based on these findings, no adverse drainage impacts to adjacent or downstream properties will be precipitated by the project.

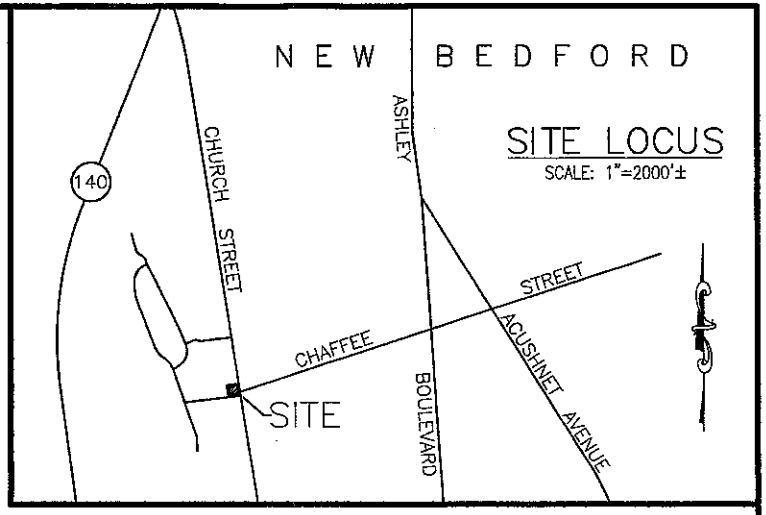
Appendix A

Existing Conditions Plan

&

HydroCAD Analysis





SCALE: 1" = 30'

30 0 15 30 60

PRE-DEVELOPMENT WATERSHED PLAN

MAP 130G-1, FORMERLY PARCELS 22,41-44
CHURCH & CHAFFEE STREET
NEW BEDFORD, MASSACHUSETTS

SCALE: 1"=30' DATE: JANUARY 23, 2017

PREPARED FOR

XCEL BRAZILIAN JUI JITSU

PREPARED BY

BOUCHER & HEUREUX, INC.

CIVIL/ENVIRONMENTAL ENGINEERS, SCIENTISTS
LAND SURVEYORS AND PLANNERS

648 AMERICAN LEGION HIGHWAY, SUITE 1, WESTPORT, MASSACHUSETTS 02790
TEL: 508-636-5905 FAX: 508-636-2477

FILE: 3245-01_SP.dwg

Grassed Area/Brush

DESIGN POINT 1

Subcat Reach Pond Link

Routing Diagram for EWS-Silva's Gym - Church Street 12-27-16
Prepared by Raposo Engineering Consulting, Printed 1/23/2017

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.640	93	Urban industrial, 72% imp, HSG D (EWS-1)
0.640	93	TOTAL AREA

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.640	HSG D	EWS-1
0.000	Other	
0.640		TOTAL AREA

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchmen Numbers
0.000	0.000	0.000	0.640	0.000	0.640	Urban industrial, 72% imp	EWS-1
0.000	**0.000**	**0.000**	**0.640**	**0.000**	**0.640**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EWS-1: Grassed Runoff Area=0.640 ac 72.00% Impervious Runoff Depth=2.56"
Flow Length=250' Tc=10.5 min CN=93 Runoff=1.58 cfs 0.137 af

Reach D-1: DESIGN POINT 1 Inflow=1.58 cfs 0.137 af
Outflow=1.58 cfs 0.137 af

Total Runoff Area = 0.640 ac Runoff Volume = 0.137 af Average Runoff Depth = 2.56"
28.00% Pervious = 0.179 ac 72.00% Impervious = 0.461 ac

Summary for Subcatchment EWS-1: Grassed Area/Brush

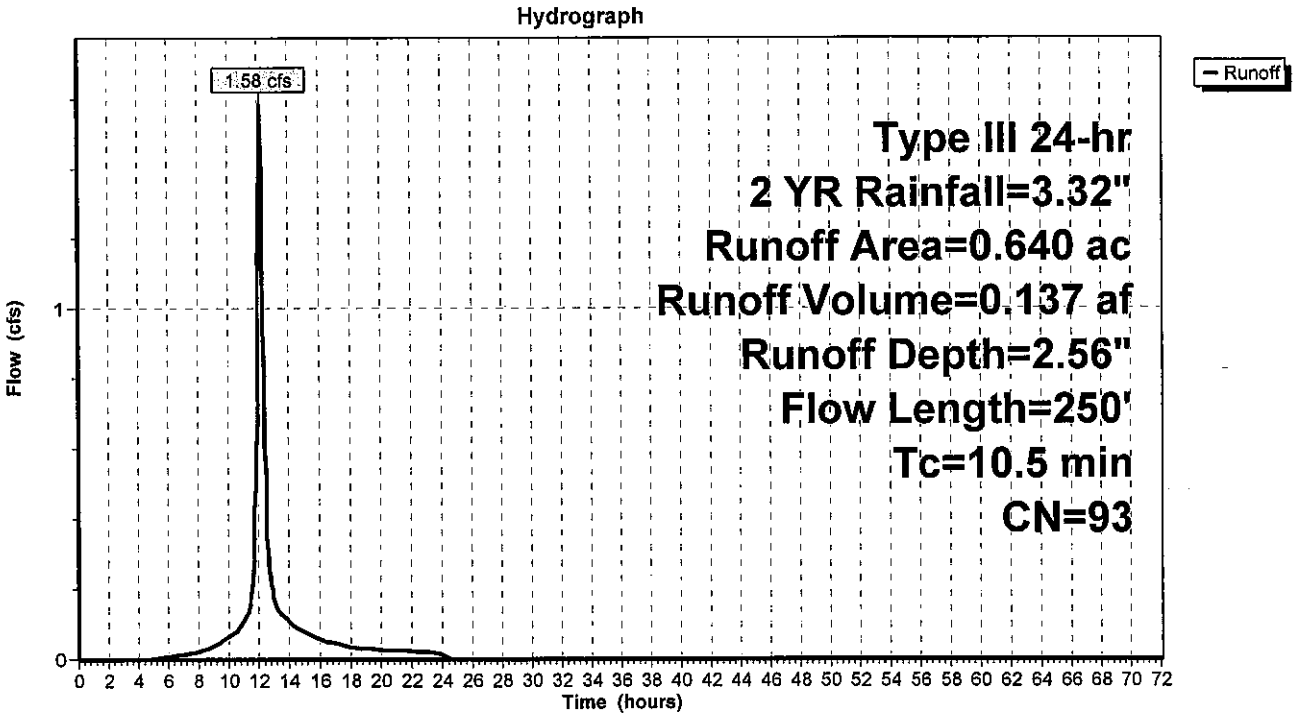
Runoff = 1.58 cfs @ 12.15 hrs, Volume= 0.137 af, Depth= 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.32"

Area (ac)	CN	Description
0.640	93	Urban industrial, 72% imp, HSG D
0.179		28.00% Pervious Area
0.461		72.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.0150	0.14		Sheet Flow, Sheet Flow, PWS-10 - A-B Grass: Short n= 0.150 P2= 3.35"
4.3	200	0.0120	0.77		Shallow Concentrated Flow, Shallow Concentrate Flow- P Short Grass Pasture Kv= 7.0 fps
10.5	250	Total			

Subcatchment EWS-1: Grassed Area/Brush



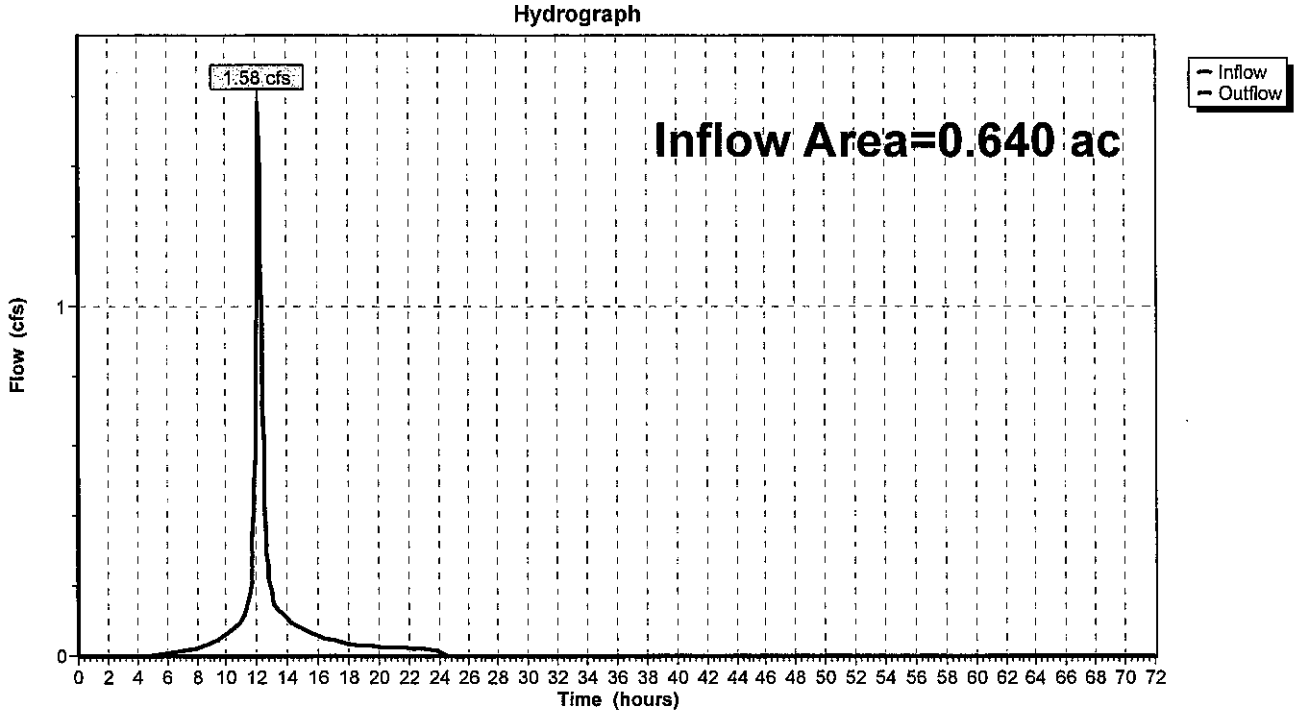
Summary for Reach D-1: DESIGN POINT 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.640 ac, 72.00% Impervious, Inflow Depth = 2.56" for 2 YR event
Inflow = 1.58 cfs @ 12.15 hrs, Volume= 0.137 af
Outflow = 1.58 cfs @ 12.15 hrs, Volume= 0.137 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach D-1: DESIGN POINT 1



Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.640	93	Urban industrial, 72% imp, HSG D (EWS-1)
0.640	93	TOTAL AREA

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.640	HSG D	EWS-1
0.000	Other	
0.640		TOTAL AREA

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchmen Numbers
0.000	0.000	0.000	0.640	0.000	0.640	Urban industrial, 72% imp	EWS-1
0.000	**0.000**	**0.000**	**0.640**	**0.000**	**0.640**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EWS-1: Grassed Runoff Area=0.640 ac 72.00% Impervious Runoff Depth=4.14"
Flow Length=250' Tc=10.5 min CN=93 Runoff=2.50 cfs 0.221 af

Reach D-1: DESIGN POINT 1 Inflow=2.50 cfs 0.221 af
Outflow=2.50 cfs 0.221 af

Total Runoff Area = 0.640 ac Runoff Volume = 0.221 af Average Runoff Depth = 4.14"
28.00% Pervious = 0.179 ac 72.00% Impervious = 0.461 ac

Summary for Subcatchment EWS-1: Grassed Area/Brush

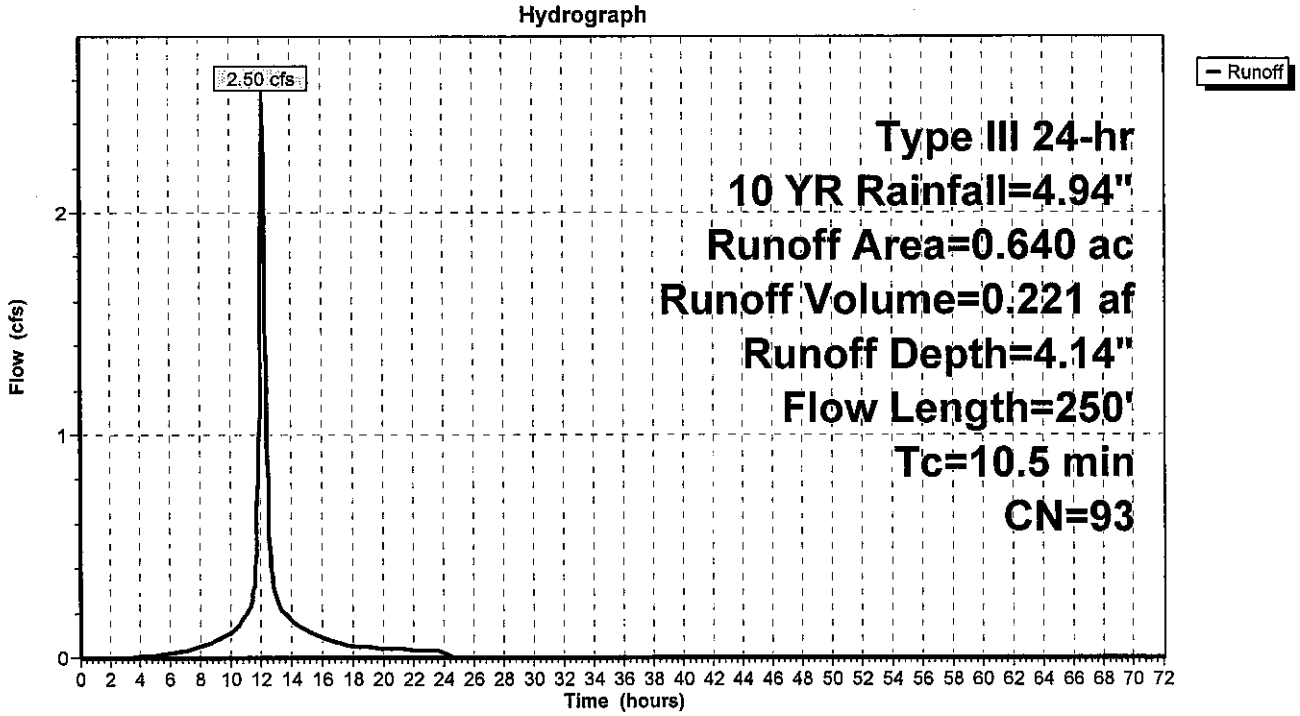
Runoff = 2.50 cfs @ 12.14 hrs, Volume= 0.221 af, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.94"

Area (ac)	CN	Description
0.640	93	Urban industrial, 72% imp, HSG D
0.179		28.00% Pervious Area
0.461		72.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.0150	0.14		Sheet Flow, Sheet Flow, PWS-10 - A-B Grass: Short n= 0.150 P2= 3.35"
4.3	200	0.0120	0.77		Shallow Concentrated Flow, Shallow Concentrate Flow- P Short Grass Pasture Kv= 7.0 fps
10.5	250	Total			

Subcatchment EWS-1: Grassed Area/Brush



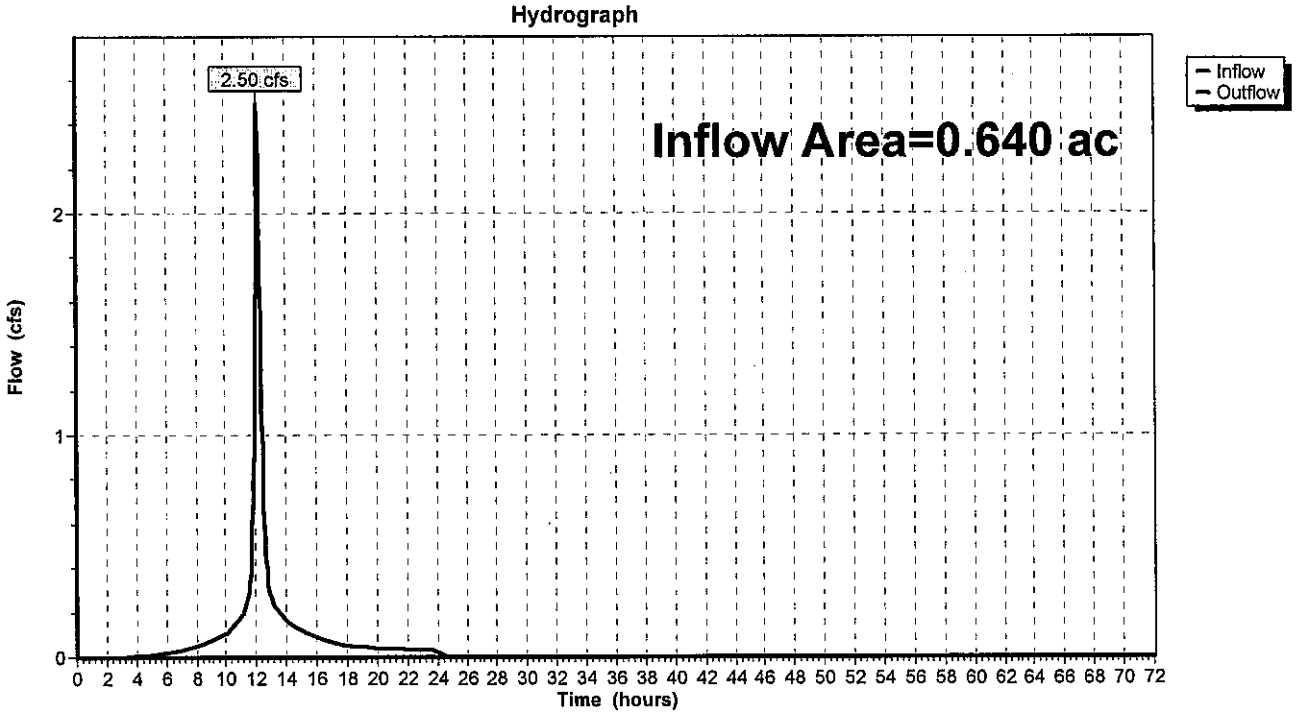
Summary for Reach D-1: DESIGN POINT 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.640 ac, 72.00% Impervious, Inflow Depth = 4.14" for 10 YR event
Inflow = 2.50 cfs @ 12.14 hrs, Volume= 0.221 af
Outflow = 2.50 cfs @ 12.14 hrs, Volume= 0.221 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach D-1: DESIGN POINT 1

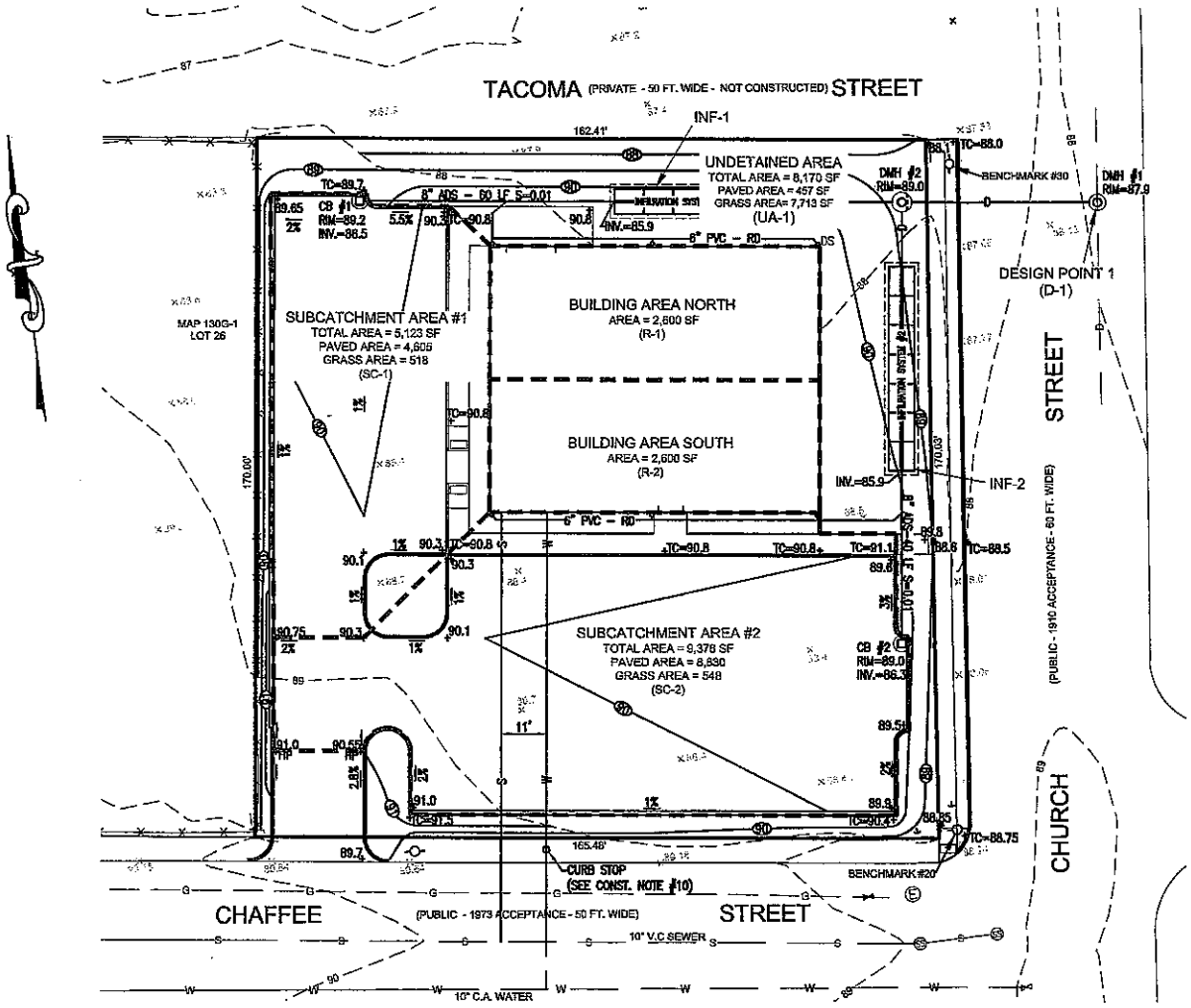


Appendix B

Proposed Conditions Plan

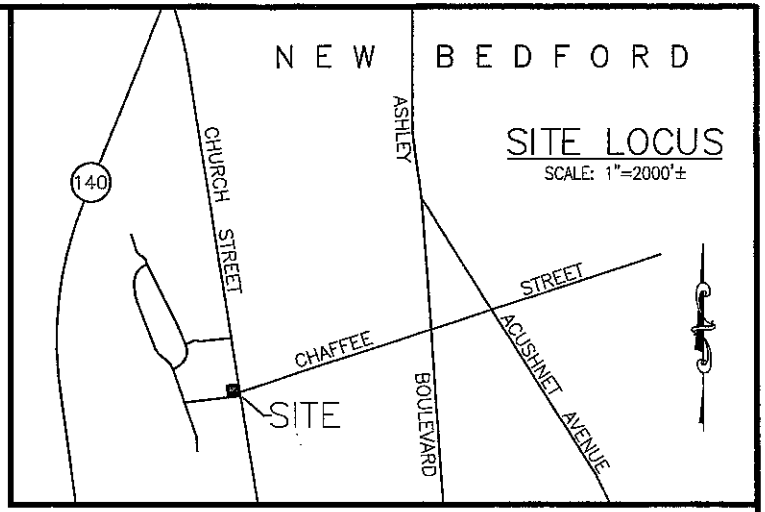
&

HydroCAD Analysis



SCALE: 1" = 30'

30 0 15 30 60



POST-DEVELOPMENT WATERSHED PLAN

MAP 130G-1, FORMERLY PARCELS 22,41-44
CHURCH & CHAFFEE STREET
NEW BEDFORD, MASSACHUSETTS

SCALE: 1"=30' DATE: JANUARY 23, 2017

PREPARED FOR

XCEL BRAZILIAN JIU JITSU

PREPARED BY

BOUCHER & HEUREUX, INC.

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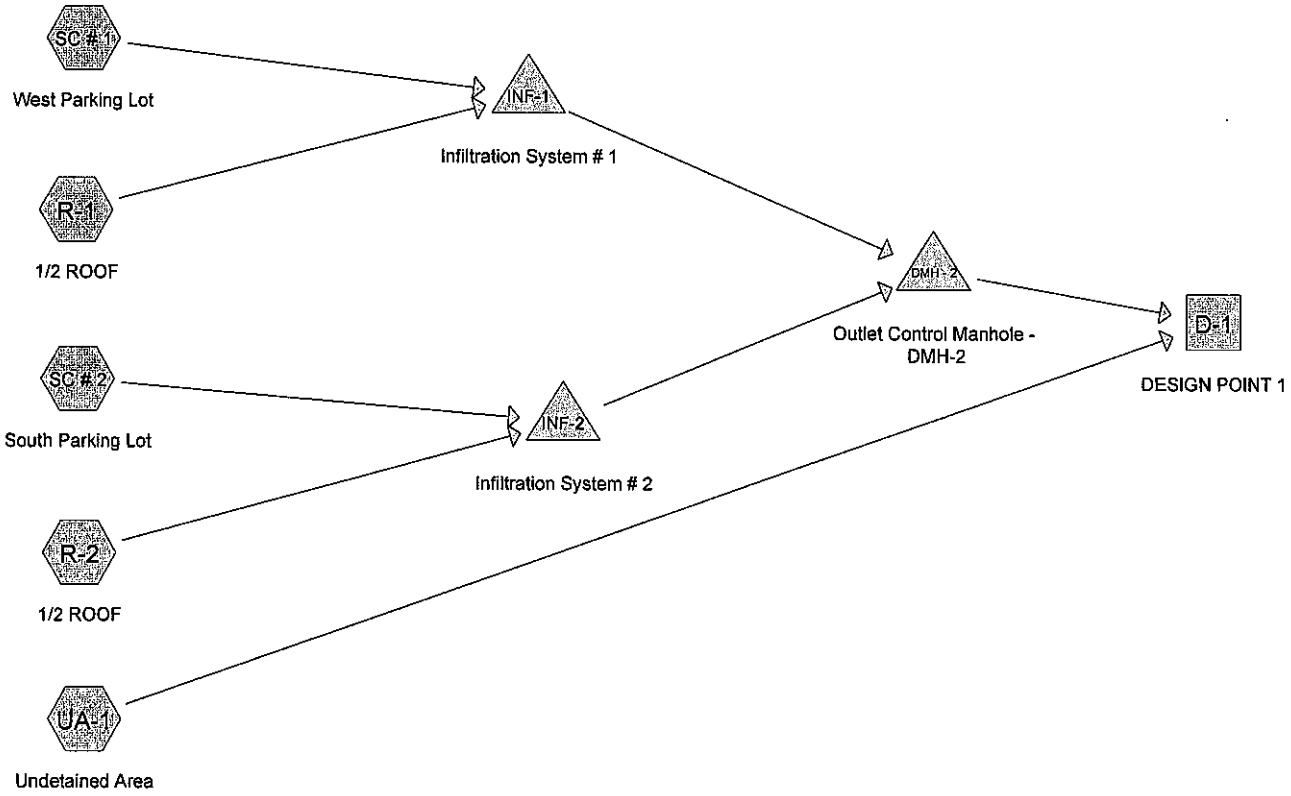
FILE: 3245-01_SP.dwg



Subcat Reach Pond Link

Routing Diagram for PWS-Silva's Gym - Church Street 1-23-2017
Prepared by Raposo Engineering Consulting, Printed 1/23/2017

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.202	80	>75% Grass cover, Good, HSG D (SC # 1, SC # 2, UA-1)
0.110	98	Impervious (SC # 1, UA-1)
0.215	98	Paved parking, HSG D (SC # 2)
0.120	98	Roof (R-1, R-2)
0.647	92	TOTAL AREA

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.417	HSG D	SC # 1, SC # 2, UA-1
0.230	Other	R-1, R-2, SC # 1, UA-1
0.647		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	0.000	0.202	0.000	0.202	>75% Grass cover, Good	SC # 1, SC # 2, UA-1
0.000	0.000	0.000	0.000	0.110	0.110	Impervious	SC # 1, UA-1
0.000	0.000	0.000	0.215	0.000	0.215	Paved parking	SC # 2
0.000	0.000	0.000	0.000	0.120	0.120	Roof	R-1, R-2
0.000	**0.000**	**0.000**	**0.417**	**0.230**	**0.647**	**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	INF-1	85.95	85.95	10.0	0.0000	0.013	8.0	0.0	0.0
2	INF-2	85.95	85.95	10.0	0.0000	0.013	8.0	0.0	0.0

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment R-1: 1/2 ROOF Runoff Area=0.060 ac 100.00% Impervious Runoff Depth=3.09"
Tc=5.0 min CN=98 Runoff=0.19 cfs 0.015 af

Subcatchment R-2: 1/2 ROOF Runoff Area=0.060 ac 100.00% Impervious Runoff Depth=3.09"
Tc=5.0 min CN=98 Runoff=0.19 cfs 0.015 af

Subcatchment SC # 1: West Parking Lot Runoff Area=0.111 ac 89.19% Impervious Runoff Depth=2.87"
Tc=8.0 min CN=96 Runoff=0.32 cfs 0.027 af

Subcatchment SC # 2: South Parking Lot Runoff Area=0.228 ac 94.30% Impervious Runoff Depth=2.98"
Tc=8.0 min CN=97 Runoff=0.67 cfs 0.057 af

Subcatchment UA-1: Undetained Area Runoff Area=0.188 ac 5.85% Impervious Runoff Depth=1.56"
Flow Length=100' Slope=0.0080 '/' Tc=14.1 min CN=81 Runoff=0.26 cfs 0.025 af

Reach D-1: DESIGN POINT 1 Inflow=1.50 cfs 0.127 af
Outflow=1.50 cfs 0.127 af

Pond DMH - 2: Outlet Control Manhole - DMH-2 Inflow=1.27 cfs 0.103 af
Primary=1.27 cfs 0.103 af

Pond INF-1: Infiltration System # 1 Peak Elev=86.45' Storage=0.006 af Inflow=0.50 cfs 0.042 af
Discarded=0.00 cfs 0.004 af Primary=0.47 cfs 0.037 af Outflow=0.47 cfs 0.041 af

Pond INF-2: Infiltration System # 2 Peak Elev=86.63' Storage=0.009 af Inflow=0.85 cfs 0.072 af
Discarded=0.00 cfs 0.005 af Primary=0.79 cfs 0.065 af Outflow=0.80 cfs 0.071 af

Total Runoff Area = 0.647 ac Runoff Volume = 0.138 af Average Runoff Depth = 2.57"
31.22% Pervious = 0.202 ac 68.78% Impervious = 0.445 ac

Summary for Subcatchment R-1: 1/2 ROOF

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

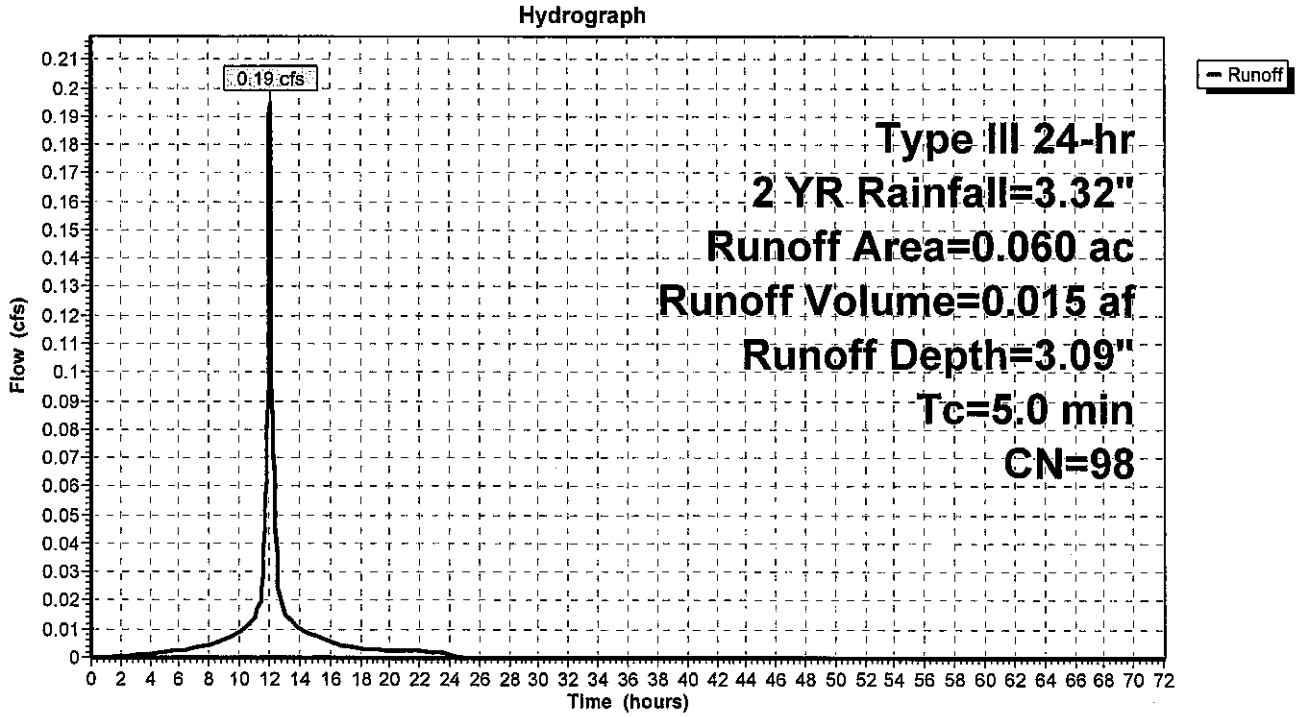
Runoff = 0.19 cfs @ 12.07 hrs, Volume= 0.015 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.32"

	Area (ac)	CN	Description
*	0.060	98	Roof
	0.060		100.00% Impervious Area

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

Subcatchment R-1: 1/2 ROOF



Summary for Subcatchment R-2: 1/2 ROOF

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

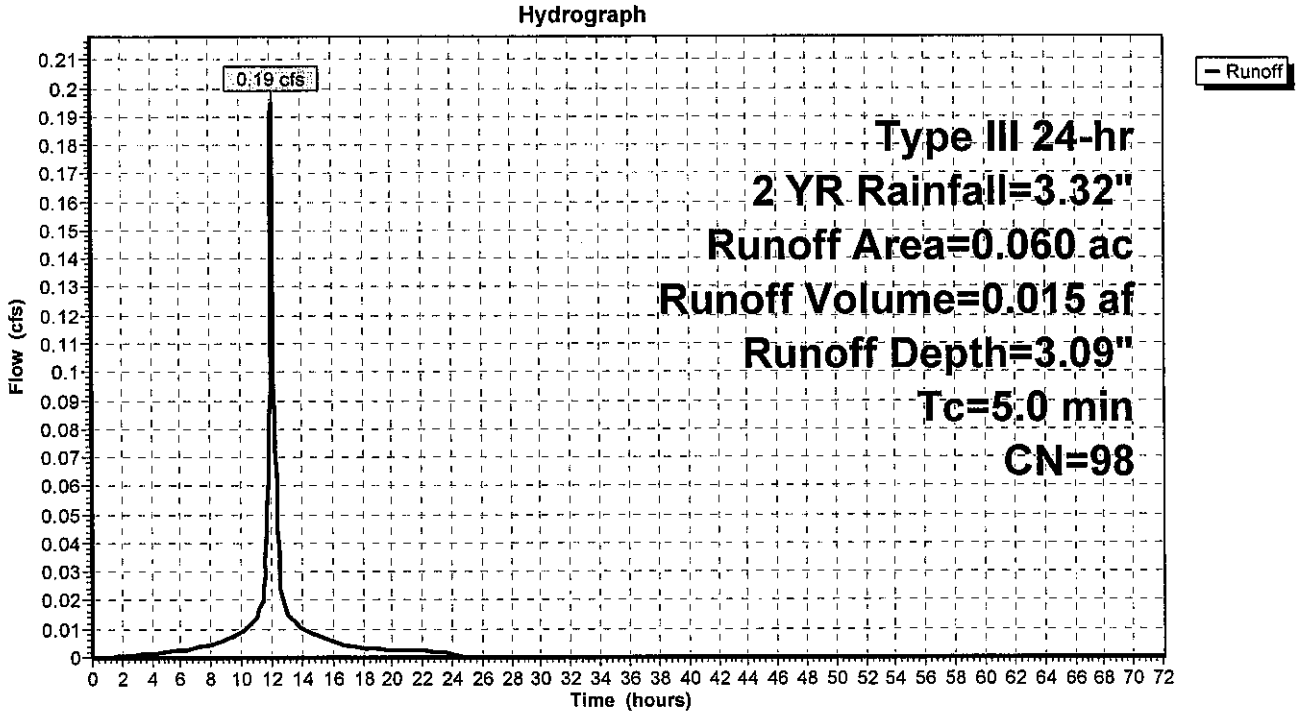
Runoff = 0.19 cfs @ 12.07 hrs, Volume= 0.015 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.32"

	Area (ac)	CN	Description
*	0.060	98	Roof
	0.060		100.00% Impervious Area

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

Subcatchment R-2: 1/2 ROOF



Summary for Subcatchment SC # 1: West Parking Lot

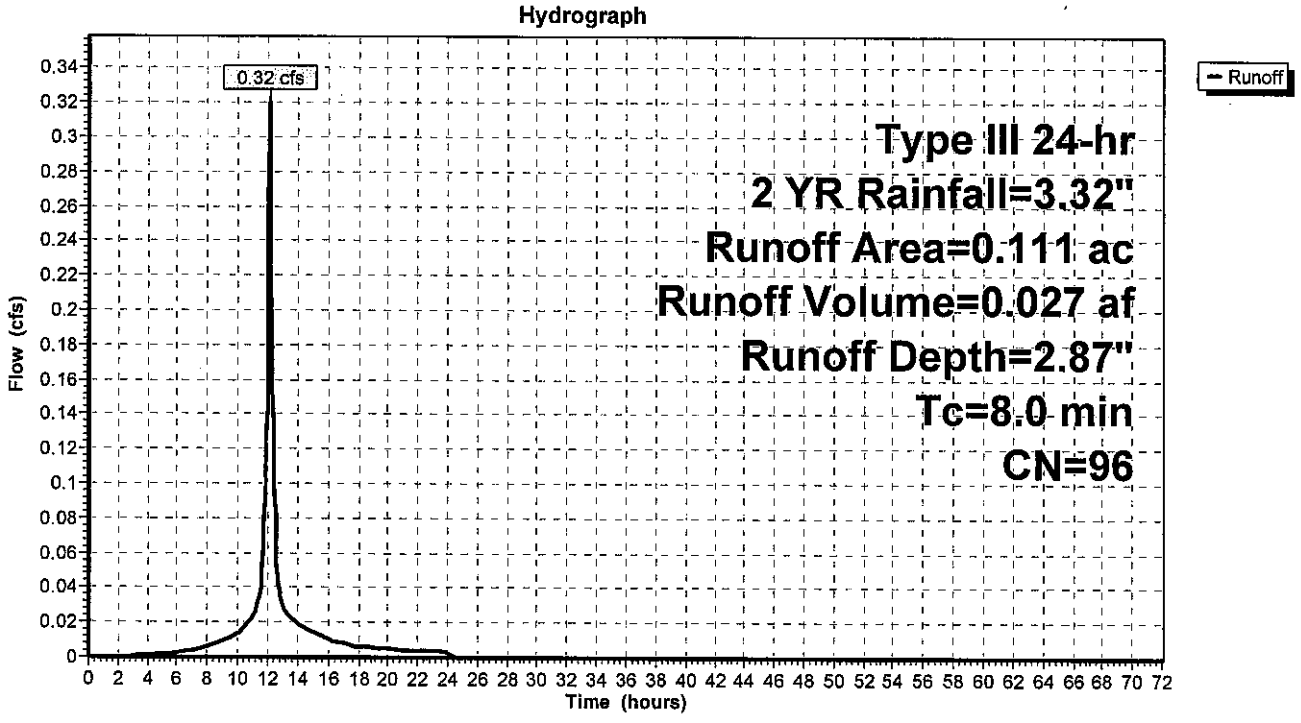
Runoff = 0.32 cfs @ 12.11 hrs, Volume= 0.027 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.32"

	Area (ac)	CN	Description
*	0.099	98	Impervious
	0.012	80	>75% Grass cover, Good, HSG D
	0.111	96	Weighted Average
	0.012		10.81% Pervious Area
	0.099		89.19% Impervious Area

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

Subcatchment SC # 1: West Parking Lot



Summary for Subcatchment SC # 2: South Parking Lot

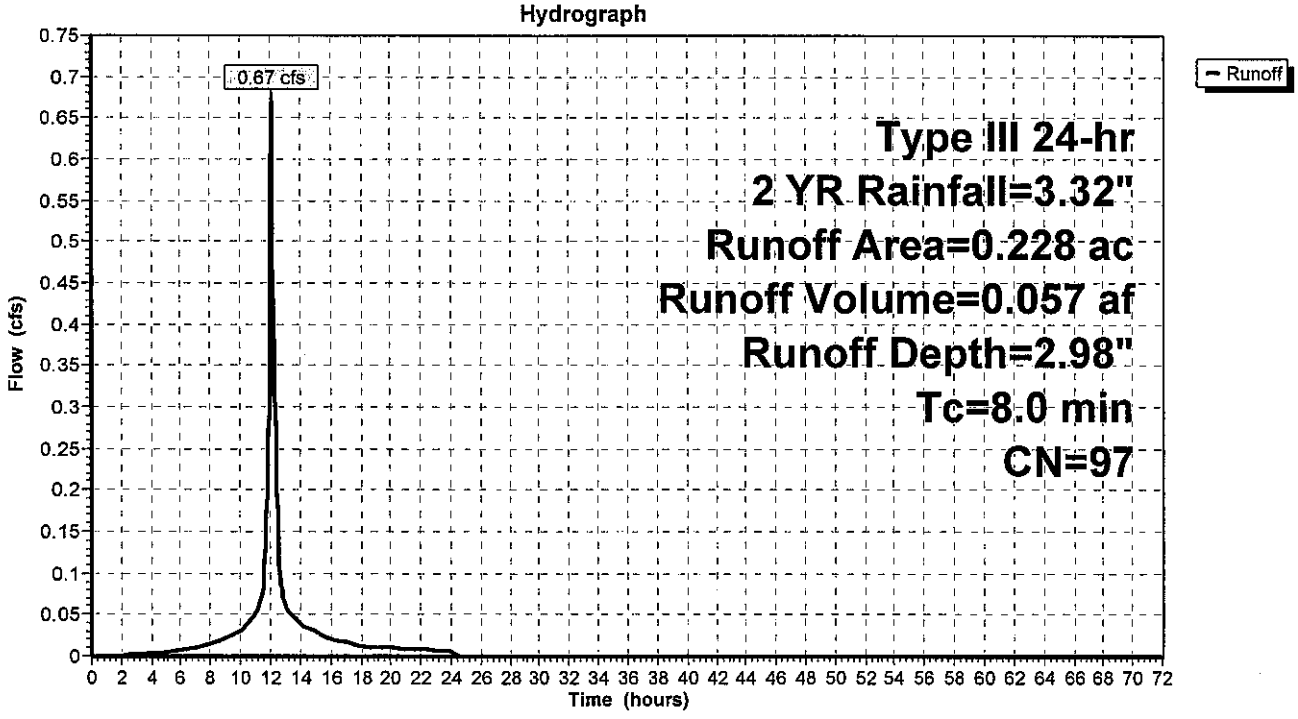
Runoff = 0.67 cfs @ 12.11 hrs, Volume= 0.057 af, Depth= 2.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.32"

Area (ac)	CN	Description
0.215	98	Paved parking, HSG D
0.013	80	>75% Grass cover, Good, HSG D
0.228	97	Weighted Average
0.013		5.70% Pervious Area
0.215		94.30% Impervious Area

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

Subcatchment SC # 2: South Parking Lot



Summary for Subcatchment UA-1: Undetained Area

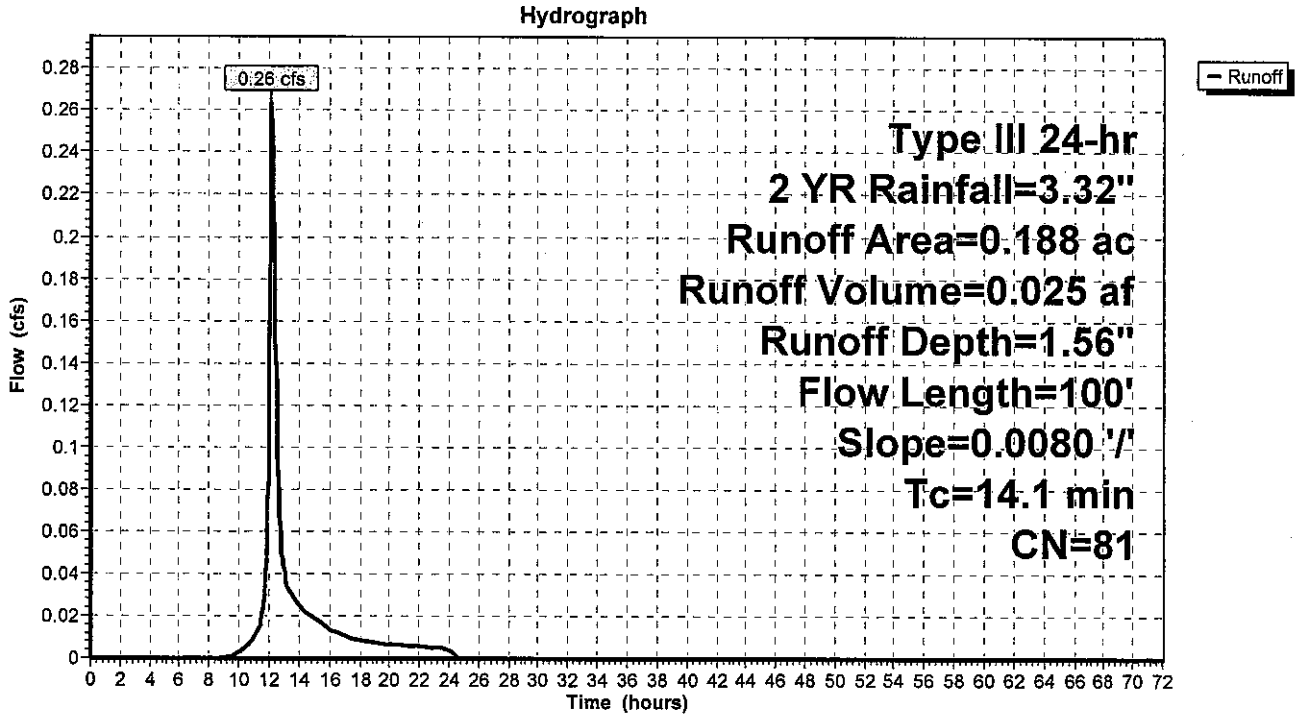
Runoff = 0.26 cfs @ 12.20 hrs, Volume= 0.025 af, Depth= 1.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.32"

	Area (ac)	CN	Description
*	0.011	98	Impervious
	0.177	80	>75% Grass cover, Good, HSG D
	0.188	81	Weighted Average
	0.177		94.15% Pervious Area
	0.011		5.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0080	0.12		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.20"

Subcatchment UA-1: Undetained Area



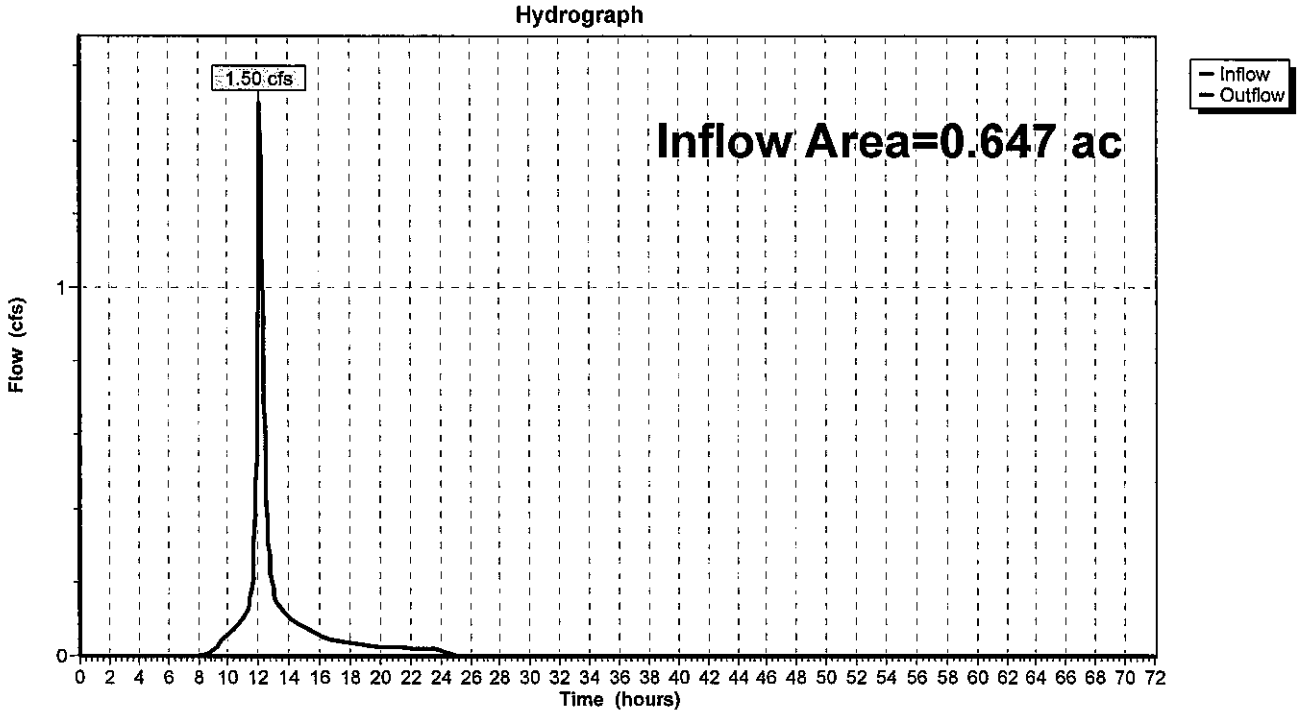
Summary for Reach D-1: DESIGN POINT 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.647 ac, 68.78% Impervious, Inflow Depth = 2.36" for 2 YR event
Inflow = 1.50 cfs @ 12.14 hrs, Volume= 0.127 af
Outflow = 1.50 cfs @ 12.14 hrs, Volume= 0.127 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach D-1: DESIGN POINT 1



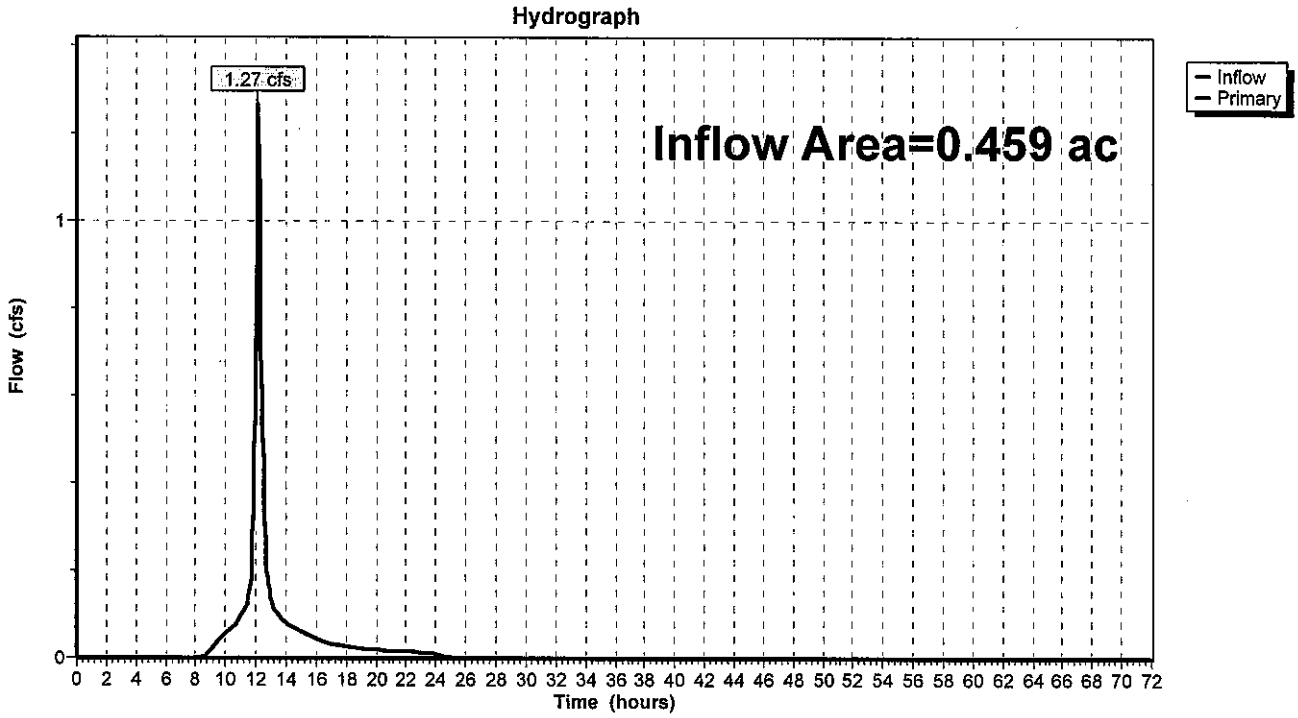
Summary for Pond DMH - 2: Outlet Control Manhole - DMH-2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.459 ac, 94.55% Impervious, Inflow Depth = 2.68" for 2 YR event
Inflow = 1.27 cfs @ 12.13 hrs, Volume= 0.103 af
Primary = 1.27 cfs @ 12.13 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond DMH - 2: Outlet Control Manhole - DMH-2



Summary for Pond INF-1: Infiltration System # 1

Inflow Area = 0.171 ac, 92.98% Impervious, Inflow Depth = 2.94" for 2 YR event
Inflow = 0.50 cfs @ 12.10 hrs, Volume= 0.042 af
Outflow = 0.47 cfs @ 12.13 hrs, Volume= 0.041 af, Atten= 6%, Lag= 1.8 min
Discarded = 0.00 cfs @ 12.13 hrs, Volume= 0.004 af
Primary = 0.47 cfs @ 12.13 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 86.45' @ 12.13 hrs Surf.Area= 0.007 ac Storage= 0.006 af

Plug-Flow detention time= 175.3 min calculated for 0.041 af (98% of inflow)
Center-of-Mass det. time= 165.7 min (933.1 - 767.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	85.10'	0.005 af	**8.17'W x 38.04'L x 2.33'H Field A** 0.017 af Overall - 0.003 af Embedded = 0.013 af x 40.0% Voids
#2A	85.60'	0.003 af	**ADS_StormTech SC-310** x 10 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 2.07 sf x 2 rows
		0.009 af	Total Available Storage

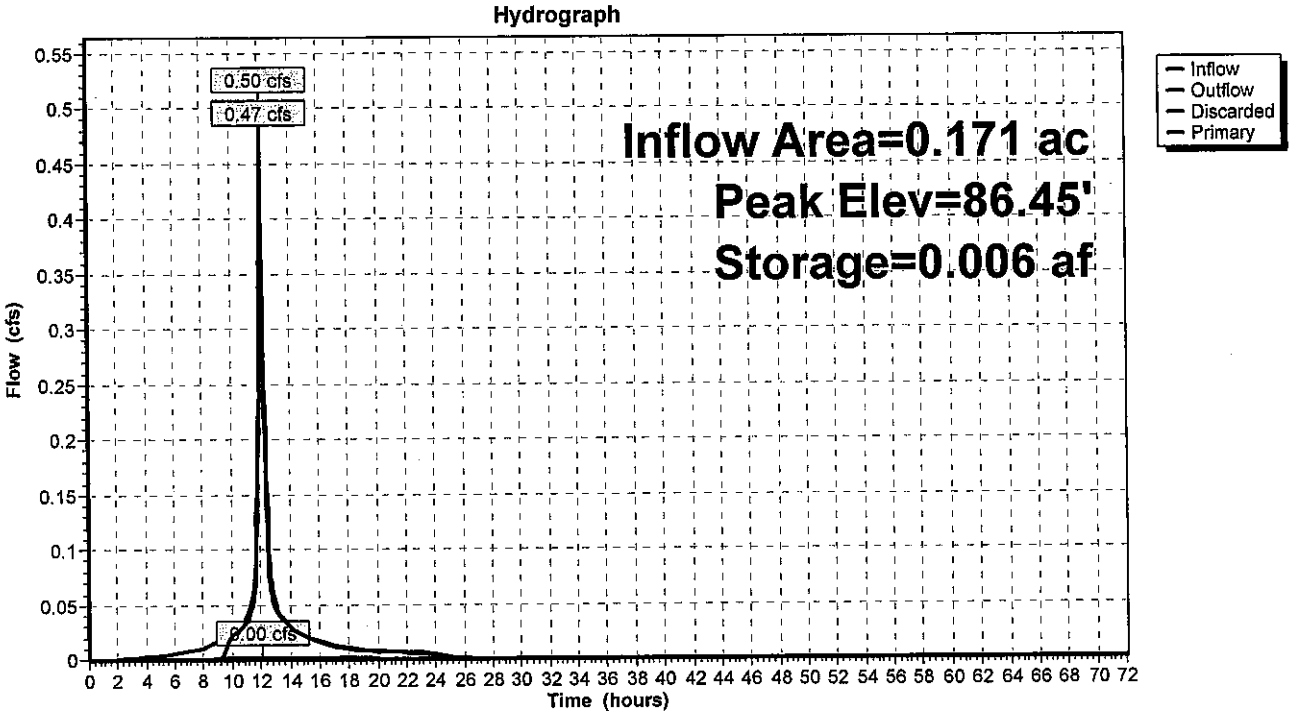
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	85.10'	**0.060 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 84.00'
#2	Primary	85.95'	**8.0" Round Culvert** L= 10.0' Ke= 0.020 Inlet / Outlet Invert= 85.95' / 85.95' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf

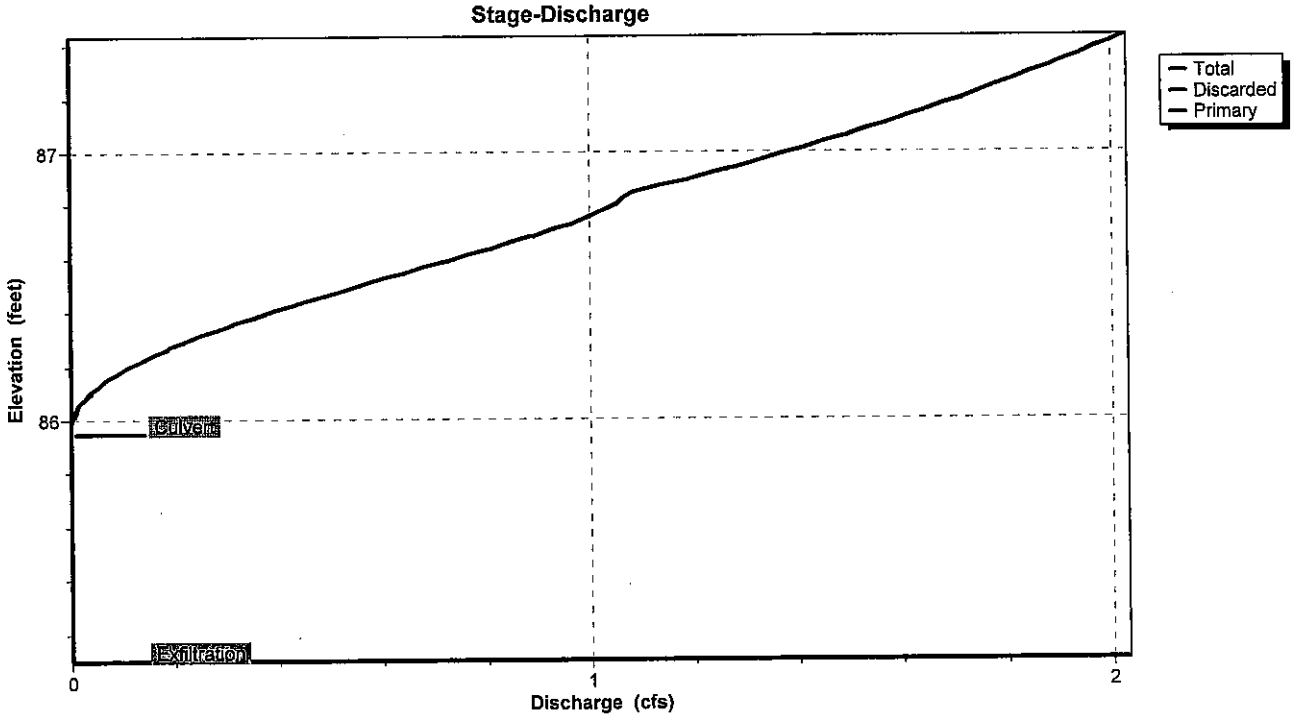
Discarded OutFlow Max=0.00 cfs @ 12.13 hrs HW=86.45' (Free Discharge)
↑—1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.46 cfs @ 12.13 hrs HW=86.45' (Free Discharge)
↑—2=Culvert (Barrel Controls 0.46 cfs @ 2.30 fps)

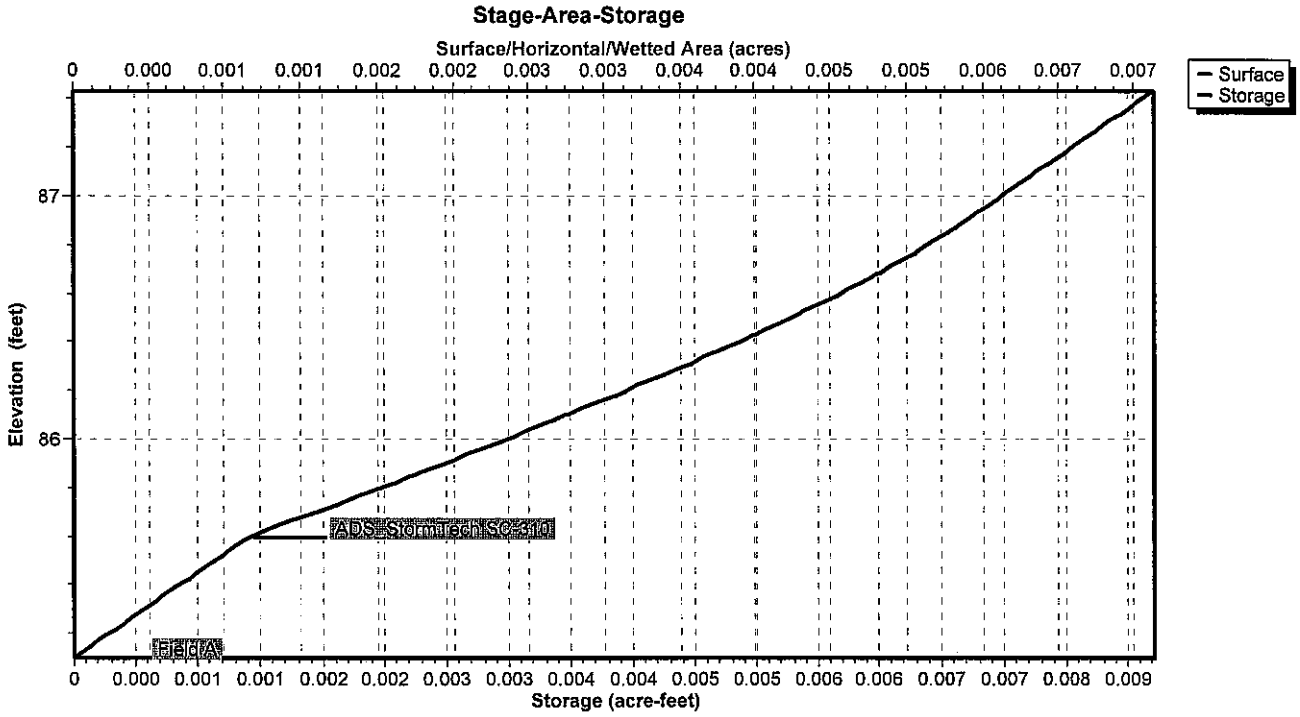
Pond INF-1: Infiltration System # 1



Pond INF-1: Infiltration System # 1



Pond INF-1: Infiltration System # 1



Summary for Pond INF-2: Infiltration System # 2

Inflow Area = 0.288 ac, 95.49% Impervious, Inflow Depth = 3.00" for 2 YR event
Inflow = 0.85 cfs @ 12.10 hrs, Volume= 0.072 af
Outflow = 0.80 cfs @ 12.14 hrs, Volume= 0.071 af, Atten= 6%, Lag= 2.2 min
Discarded = 0.00 cfs @ 12.14 hrs, Volume= 0.005 af
Primary = 0.79 cfs @ 12.14 hrs, Volume= 0.065 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 86.63' @ 12.14 hrs Surf.Area= 0.010 ac Storage= 0.009 af

Plug-Flow detention time= 146.2 min calculated for 0.071 af (98% of inflow)
Center-of-Mass det. time= 138.3 min (902.7 - 764.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	85.10'	0.007 af	**8.17'W x 52.28'L x 2.33'H Field A** 0.023 af Overall - 0.005 af Embedded = 0.018 af x 40.0% Voids
#2A	85.60'	0.005 af	**ADS_StormTech SC-310** x 14 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 2.07 sf x 2 rows
		0.012 af	Total Available Storage

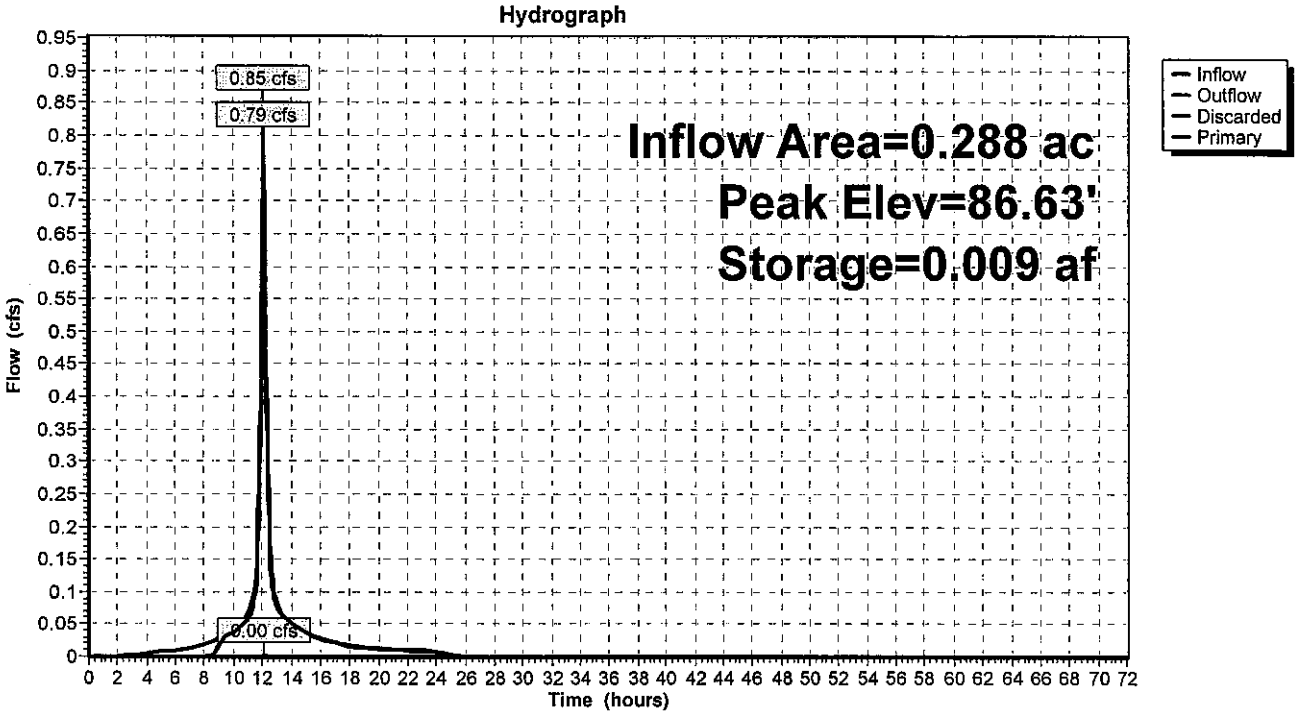
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	85.10'	**0.060 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 84.00'
#2	Primary	85.95'	**8.0" Round Culvert** L= 10.0' Ke= 0.020 Inlet / Outlet Invert= 85.95' / 85.95' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf

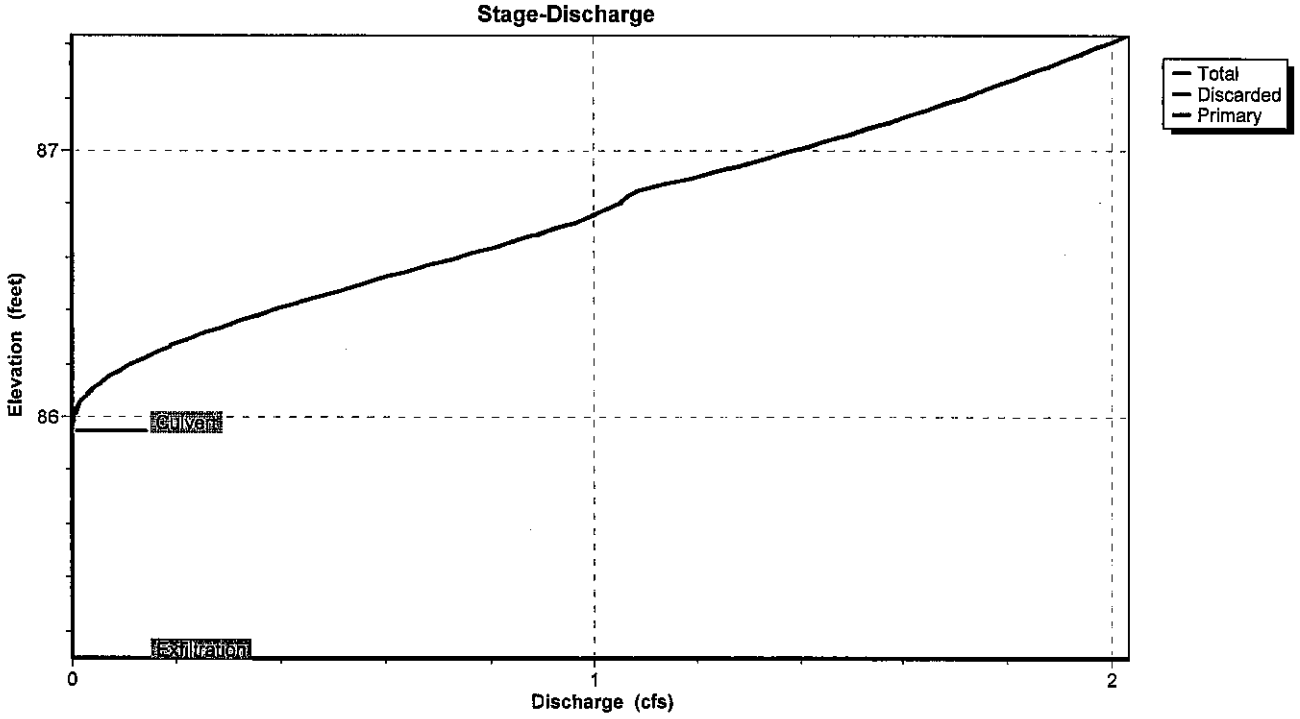
Discarded OutFlow Max=0.00 cfs @ 12.14 hrs HW=86.63' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.78 cfs @ 12.14 hrs HW=86.63' (Free Discharge)
↑—**2=Culvert** (Barrel Controls 0.78 cfs @ 2.75 fps)

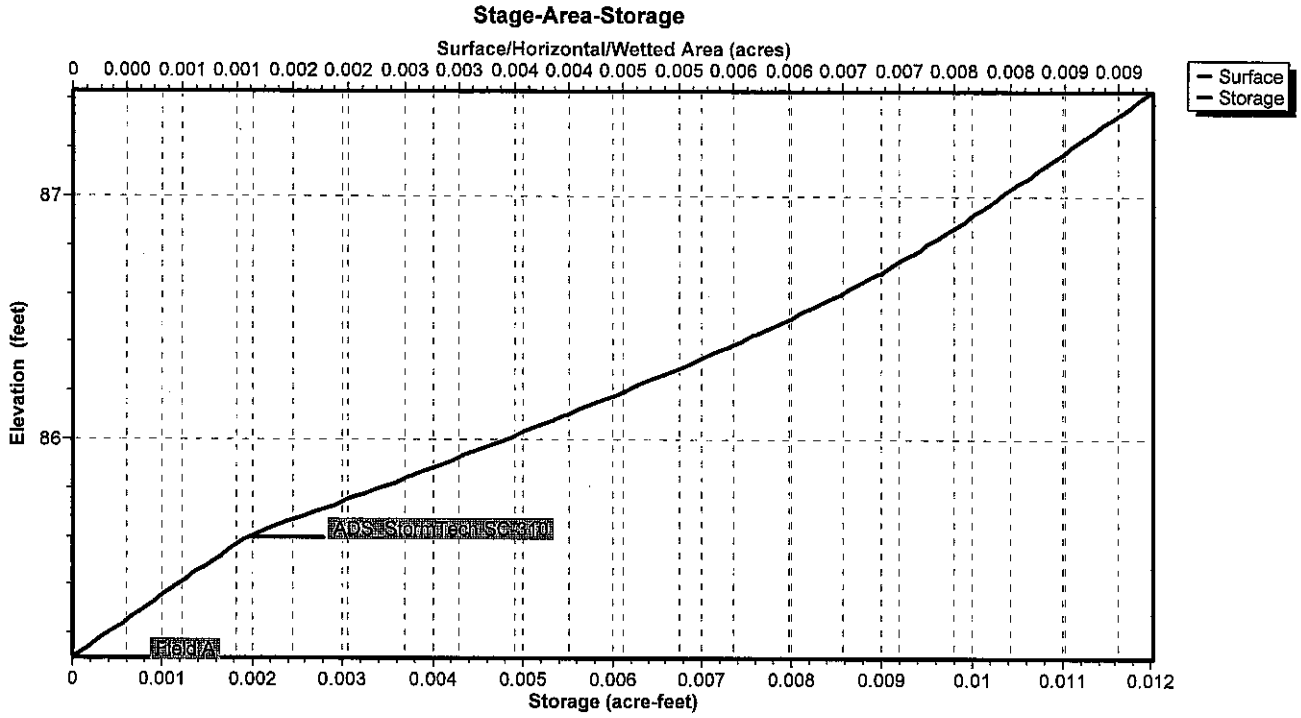
Pond INF-2: Infiltration System # 2



Pond INF-2: Infiltration System # 2



Pond INF-2: Infiltration System # 2



Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.202	80	>75% Grass cover, Good, HSG D (SC # 1, SC # 2, UA-1)
0.110	98	Impervious (SC # 1, UA-1)
0.215	98	Paved parking, HSG D (SC # 2)
0.120	98	Roof (R-1, R-2)
0.647	92	TOTAL AREA

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.417	HSG D	SC # 1, SC # 2, UA-1
0.230	Other	R-1, R-2, SC # 1, UA-1
0.647		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	0.000	0.202	0.000	0.202	>75% Grass cover, Good	SC # 1, SC # 2, UA-1
0.000	0.000	0.000	0.000	0.110	0.110	Impervious	SC # 1, UA-1
0.000	0.000	0.000	0.215	0.000	0.215	Paved parking	SC # 2
0.000	0.000	0.000	0.000	0.120	0.120	Roof	R-1, R-2
0.000	0.000	0.000	0.417	0.230	0.647	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	INF-1	85.95	85.95	10.0	0.0000	0.013	8.0	0.0	0.0
2	INF-2	85.95	85.95	10.0	0.0000	0.013	8.0	0.0	0.0

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment R-1: 1/2 ROOF Runoff Area=0.060 ac 100.00% Impervious Runoff Depth=4.70"
Tc=5.0 min CN=98 Runoff=0.29 cfs 0.024 af

Subcatchment R-2: 1/2 ROOF Runoff Area=0.060 ac 100.00% Impervious Runoff Depth=4.70"
Tc=5.0 min CN=98 Runoff=0.29 cfs 0.024 af

Subcatchment SC # 1: West Parking Lot Runoff Area=0.111 ac 89.19% Impervious Runoff Depth=4.47"
Tc=8.0 min CN=96 Runoff=0.49 cfs 0.041 af

Subcatchment SC # 2: South Parking Lot Runoff Area=0.228 ac 94.30% Impervious Runoff Depth=4.59"
Tc=8.0 min CN=97 Runoff=1.01 cfs 0.087 af

Subcatchment UA-1: Undetained Area Runoff Area=0.188 ac 5.85% Impervious Runoff Depth=2.93"
Flow Length=100' Slope=0.0080 '/' Tc=14.1 min CN=81 Runoff=0.50 cfs 0.046 af

Reach D-1: DESIGN POINT 1 Inflow=2.39 cfs 0.210 af
Outflow=2.39 cfs 0.210 af

Pond DMH - 2: Outlet Control Manhole - DMH-2 Inflow=1.93 cfs 0.164 af
Primary=1.93 cfs 0.164 af

Pond INF-1: Infiltration System # 1 Peak Elev=86.60' Storage=0.006 af Inflow=0.76 cfs 0.065 af
Discarded=0.00 cfs 0.004 af Primary=0.73 cfs 0.060 af Outflow=0.73 cfs 0.064 af

Pond INF-2: Infiltration System # 2 Peak Elev=86.91' Storage=0.010 af Inflow=1.28 cfs 0.111 af
Discarded=0.00 cfs 0.006 af Primary=1.21 cfs 0.104 af Outflow=1.21 cfs 0.110 af

Total Runoff Area = 0.647 ac Runoff Volume = 0.222 af Average Runoff Depth = 4.11"
31.22% Pervious = 0.202 ac 68.78% Impervious = 0.445 ac

Summary for Subcatchment R-1: 1/2 ROOF

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

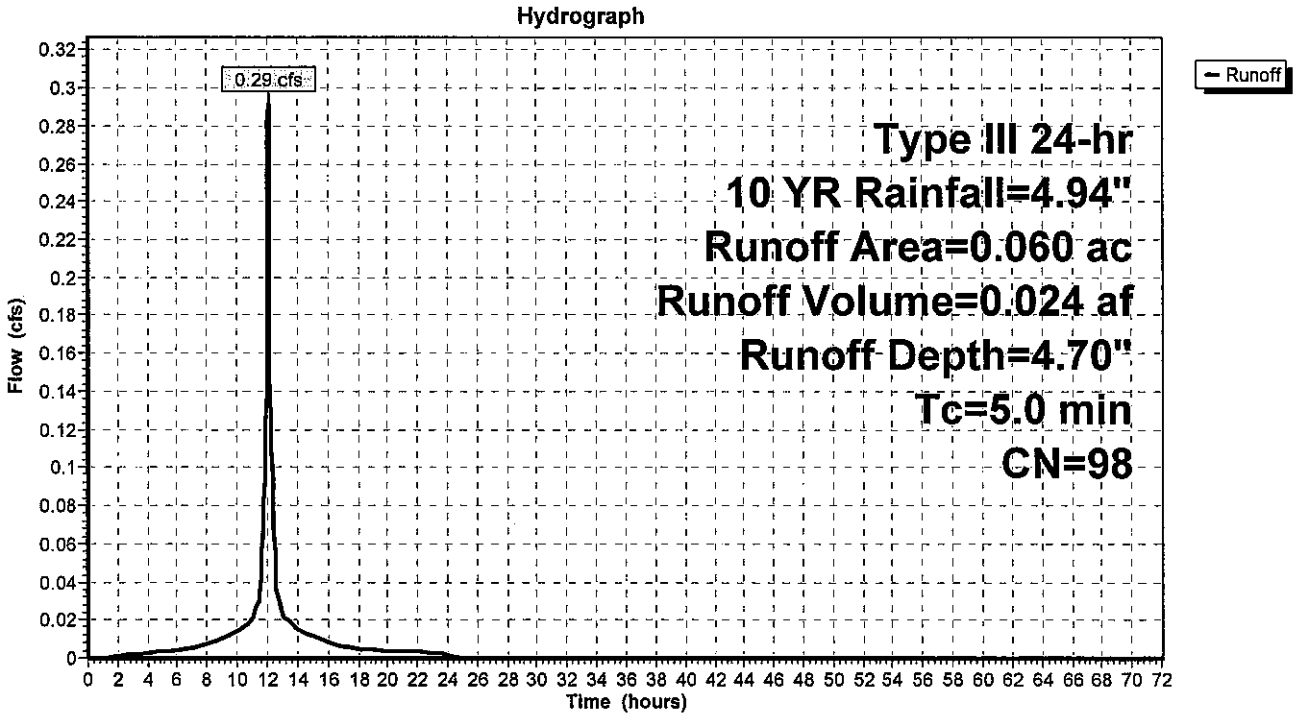
Runoff = 0.29 cfs @ 12.07 hrs, Volume= 0.024 af, Depth= 4.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.94"

	Area (ac)	CN	Description
*	0.060	98	Roof
	0.060		100.00% Impervious Area

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

Subcatchment R-1: 1/2 ROOF



Summary for Subcatchment R-2: 1/2 ROOF

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

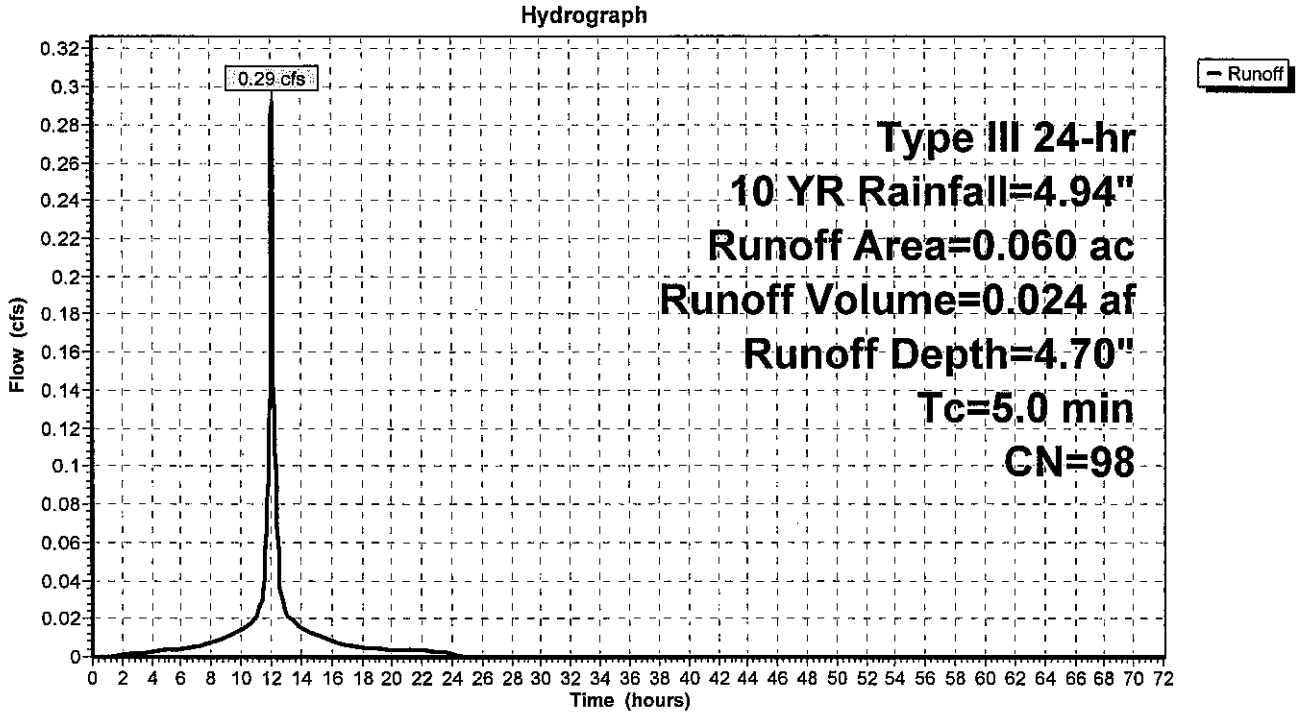
Runoff = 0.29 cfs @ 12.07 hrs, Volume= 0.024 af, Depth= 4.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.94"

	Area (ac)	CN	Description
*	0.060	98	Roof
	0.060		100.00% Impervious Area

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

Subcatchment R-2: 1/2 ROOF



Summary for Subcatchment SC # 1: West Parking Lot

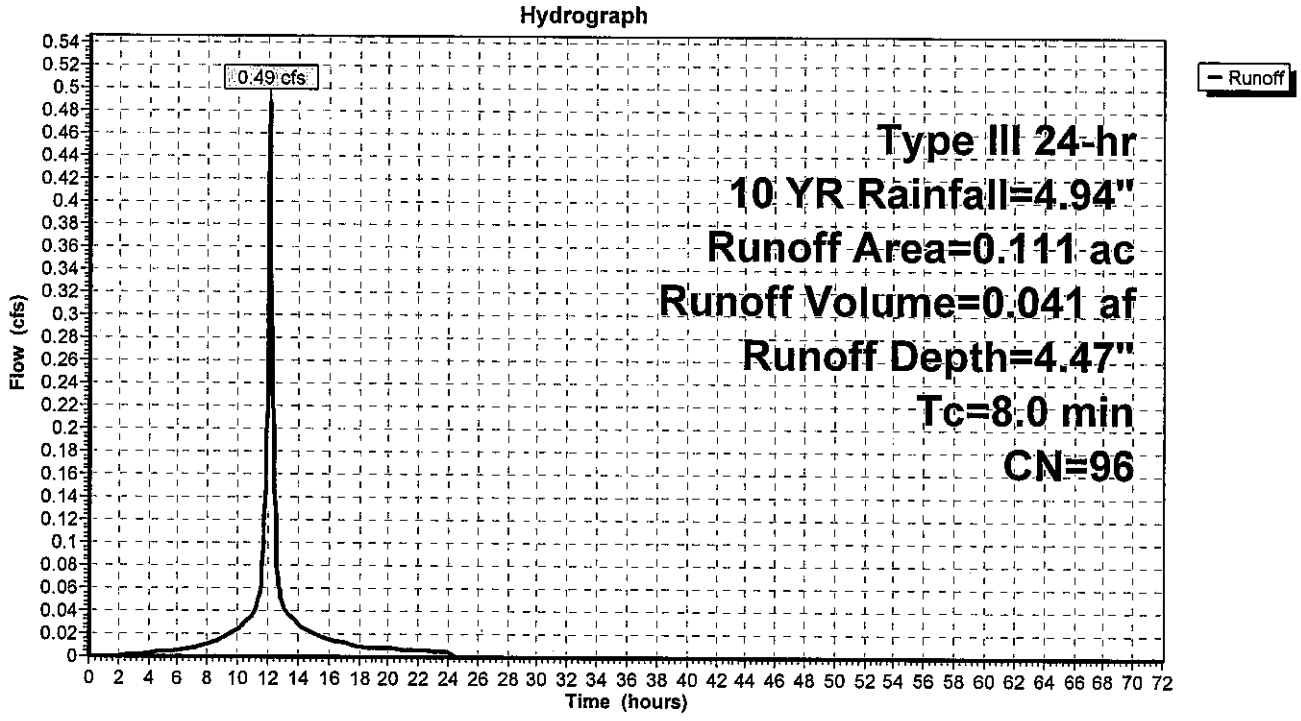
Runoff = 0.49 cfs @ 12.11 hrs, Volume= 0.041 af, Depth= 4.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.94"

	Area (ac)	CN	Description
*	0.099	98	Impervious
	0.012	80	>75% Grass cover, Good, HSG D
	0.111	96	Weighted Average
	0.012		10.81% Pervious Area
	0.099		89.19% Impervious Area

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

Subcatchment SC # 1: West Parking Lot



Summary for Subcatchment SC # 2: South Parking Lot

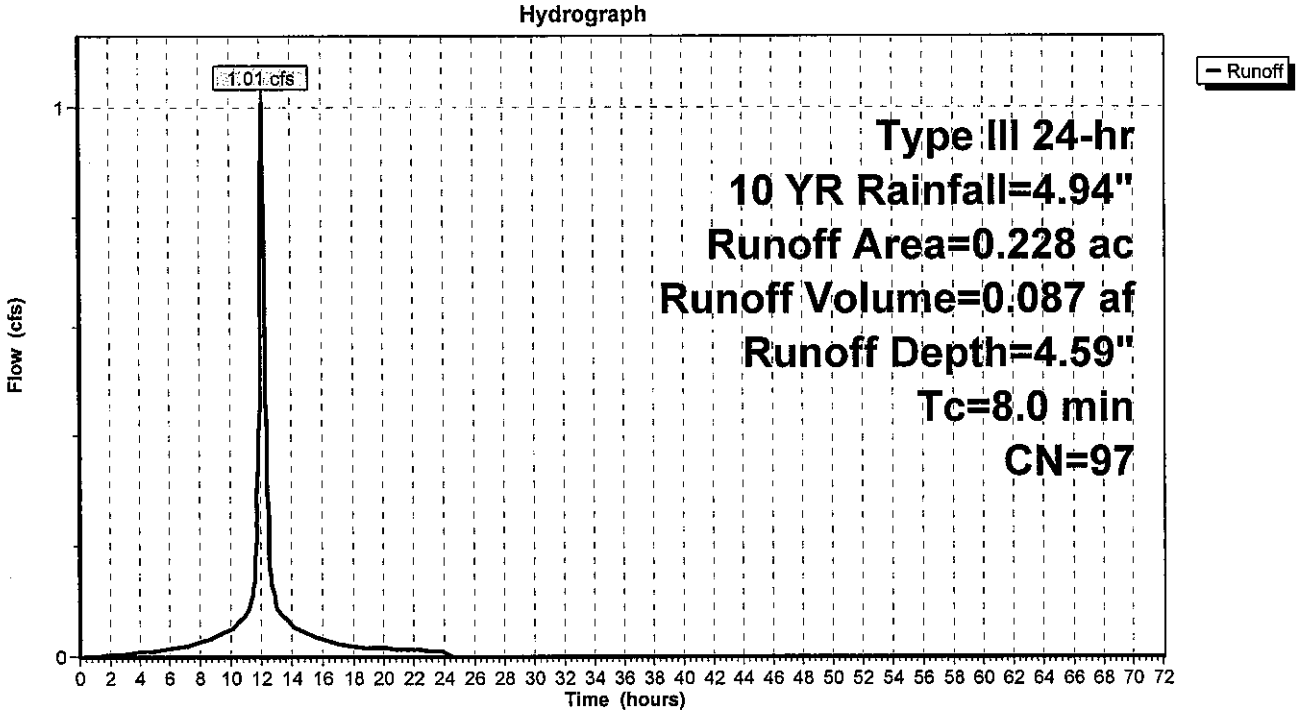
Runoff = 1.01 cfs @ 12.11 hrs, Volume= 0.087 af, Depth= 4.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.94"

Area (ac)	CN	Description
0.215	98	Paved parking, HSG D
0.013	80	>75% Grass cover, Good, HSG D
0.228	97	Weighted Average
0.013		5.70% Pervious Area
0.215		94.30% Impervious Area

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

Subcatchment SC # 2: South Parking Lot



Summary for Subcatchment UA-1: Undetained Area

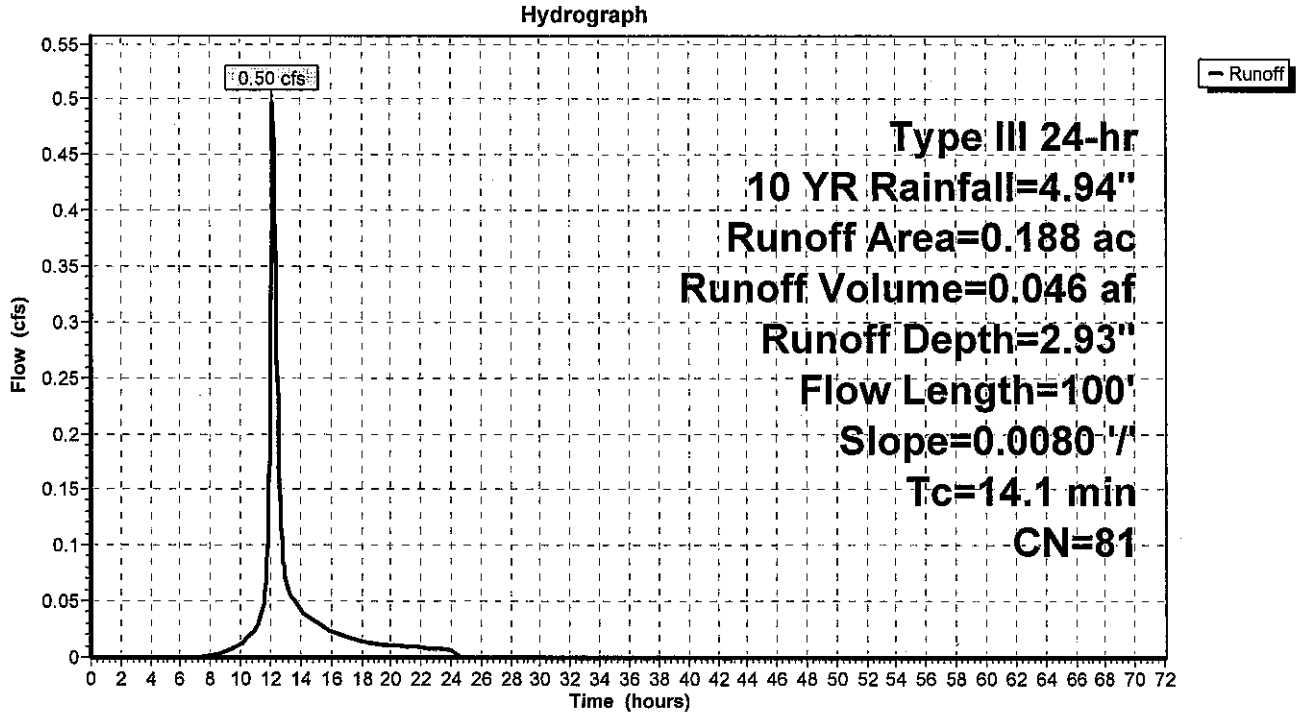
Runoff = 0.50 cfs @ 12.20 hrs, Volume= 0.046 af, Depth= 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.94"

	Area (ac)	CN	Description
*	0.011	98	Impervious
	0.177	80	>75% Grass cover, Good, HSG D
	0.188	81	Weighted Average
	0.177		94.15% Pervious Area
	0.011		5.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0080	0.12		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.20"

Subcatchment UA-1: Undetained Area



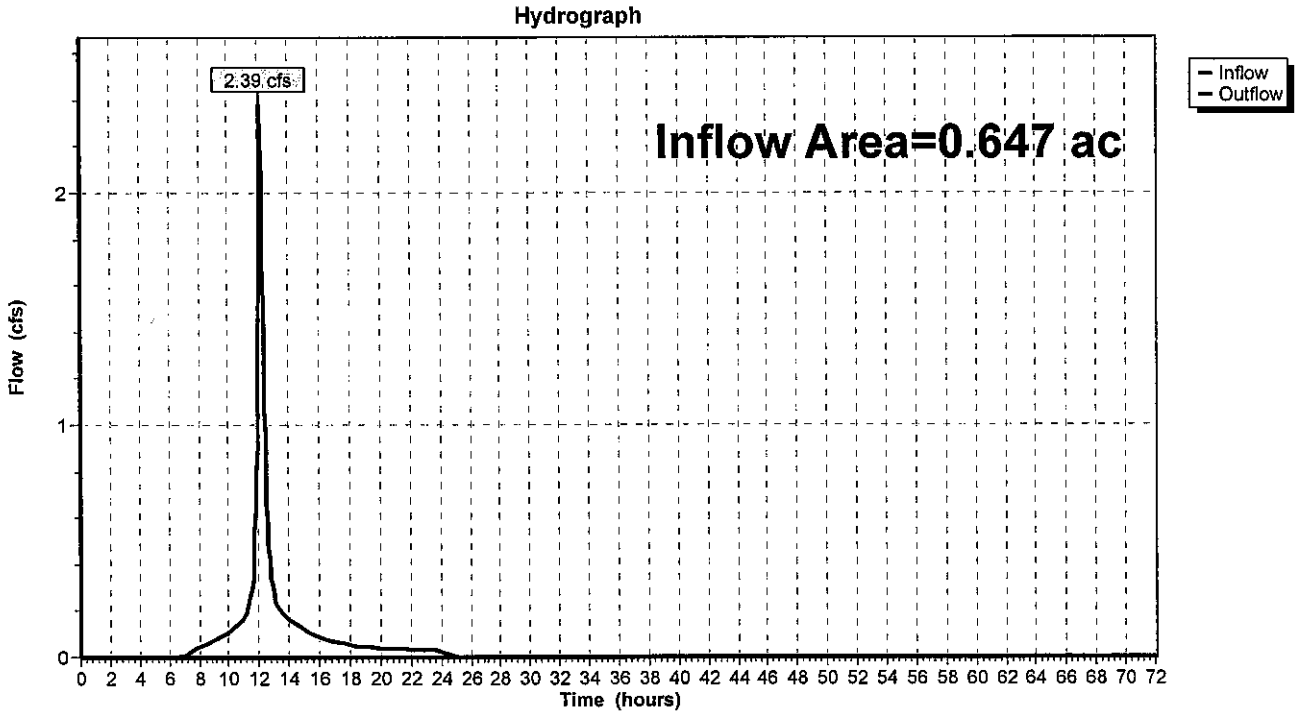
Summary for Reach D-1: DESIGN POINT 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.647 ac, 68.78% Impervious, Inflow Depth = 3.90" for 10 YR event
Inflow = 2.39 cfs @ 12.14 hrs, Volume= 0.210 af
Outflow = 2.39 cfs @ 12.14 hrs, Volume= 0.210 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach D-1: DESIGN POINT 1



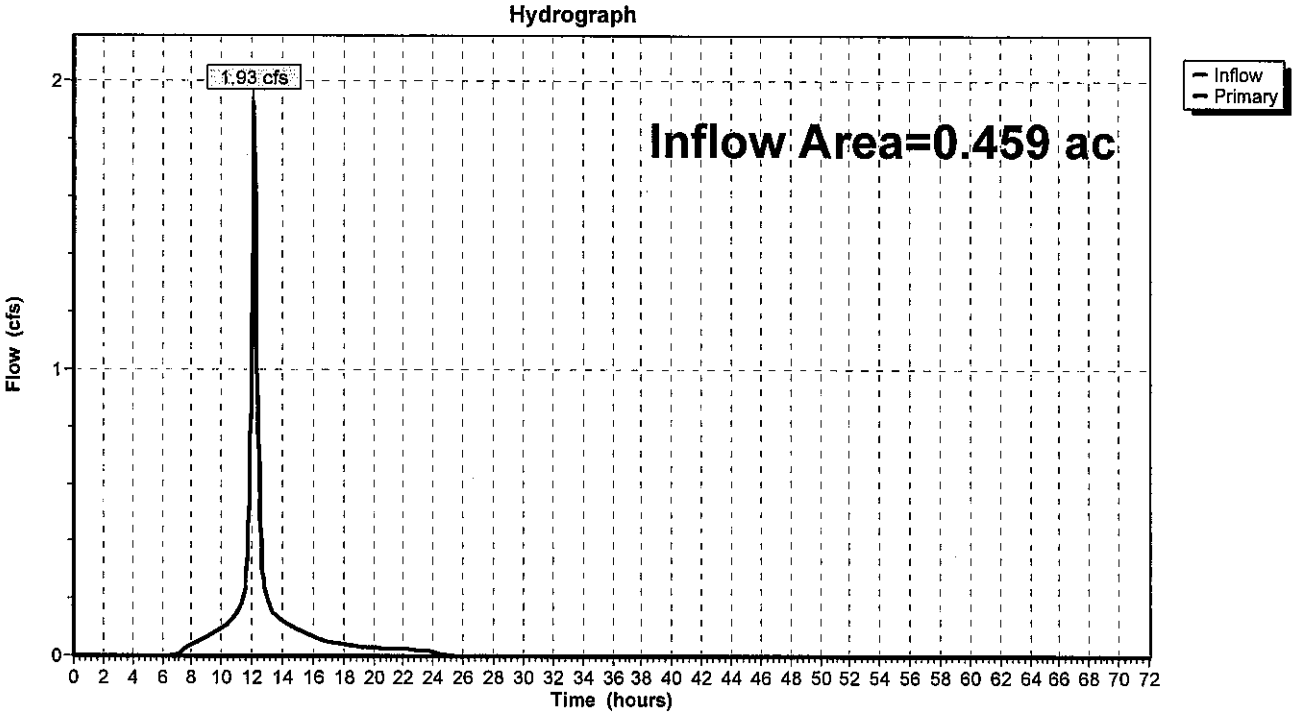
Summary for Pond DMH - 2: Outlet Control Manhole - DMH-2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.459 ac, 94.55% Impervious, Inflow Depth = 4.29" for 10 YR event
Inflow = 1.93 cfs @ 12.13 hrs, Volume= 0.164 af
Primary = 1.93 cfs @ 12.13 hrs, Volume= 0.164 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond DMH - 2: Outlet Control Manhole - DMH-2



Summary for Pond INF-1: Infiltration System # 1

Inflow Area = 0.171 ac, 92.98% Impervious, Inflow Depth = 4.55" for 10 YR event
Inflow = 0.76 cfs @ 12.10 hrs, Volume= 0.065 af
Outflow = 0.73 cfs @ 12.12 hrs, Volume= 0.064 af, Atten= 4%, Lag= 1.6 min
Discarded = 0.00 cfs @ 12.12 hrs, Volume= 0.004 af
Primary = 0.73 cfs @ 12.12 hrs, Volume= 0.060 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 86.60' @ 12.12 hrs Surf.Area= 0.007 ac Storage= 0.006 af

Plug-Flow detention time= 121.6 min calculated for 0.064 af (99% of inflow)
Center-of-Mass det. time= 113.8 min (872.1 - 758.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	85.10'	0.005 af	**8.17'W x 38.04'L x 2.33'H Field A** 0.017 af Overall - 0.003 af Embedded = 0.013 af x 40.0% Voids
#2A	85.60'	0.003 af	**ADS_StormTech SC-310** x 10 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 2.07 sf x 2 rows
		0.009 af	Total Available Storage

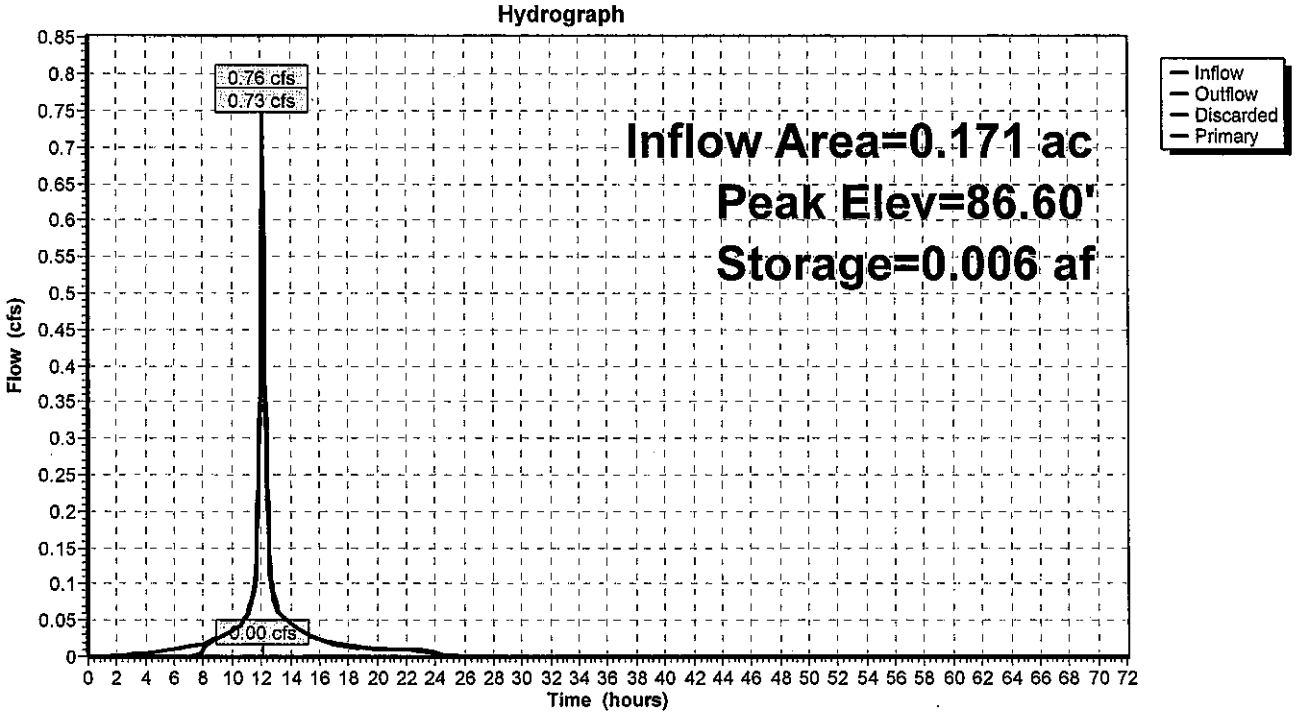
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	85.10'	**0.060 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 84.00'
#2	Primary	85.95'	**8.0" Round Culvert** L= 10.0' Ke= 0.020 Inlet / Outlet Invert= 85.95' / 85.95' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf

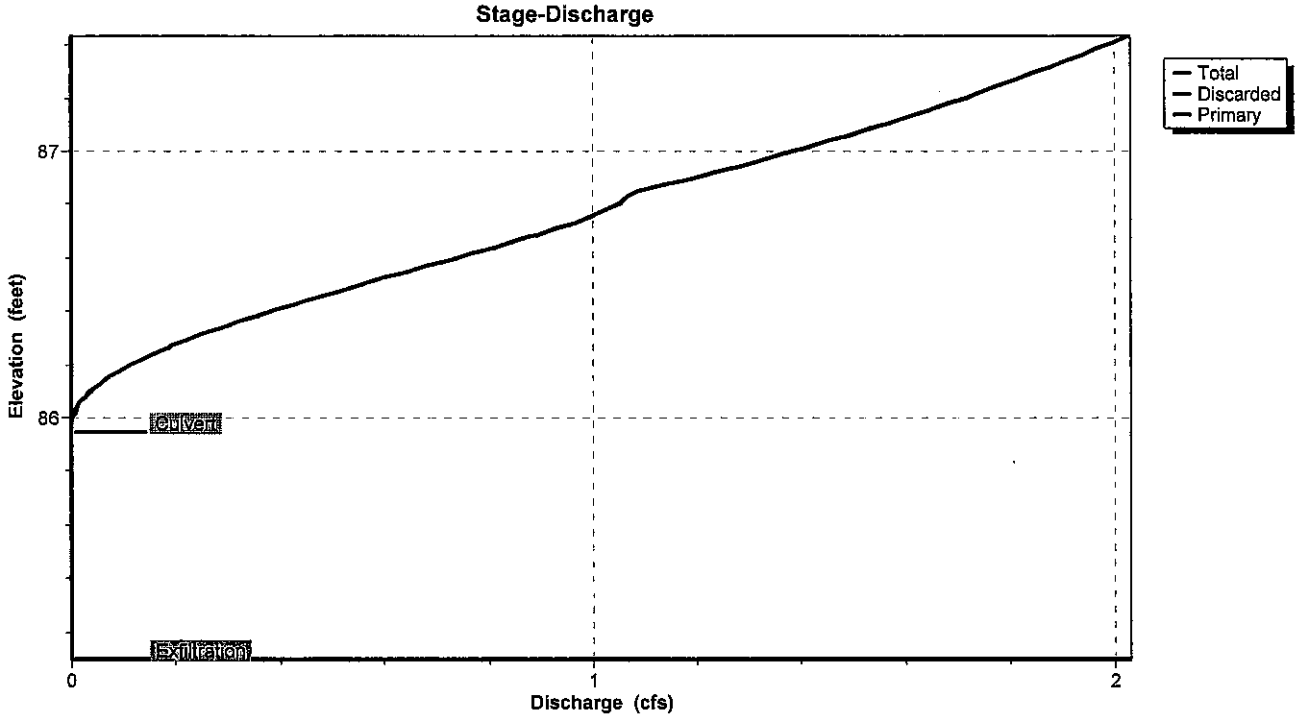
Discarded OutFlow Max=0.00 cfs @ 12.12 hrs HW=86.59' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.71 cfs @ 12.12 hrs HW=86.59' (Free Discharge)
↑—**2=Culvert** (Barrel Controls 0.71 cfs @ 2.66 fps)

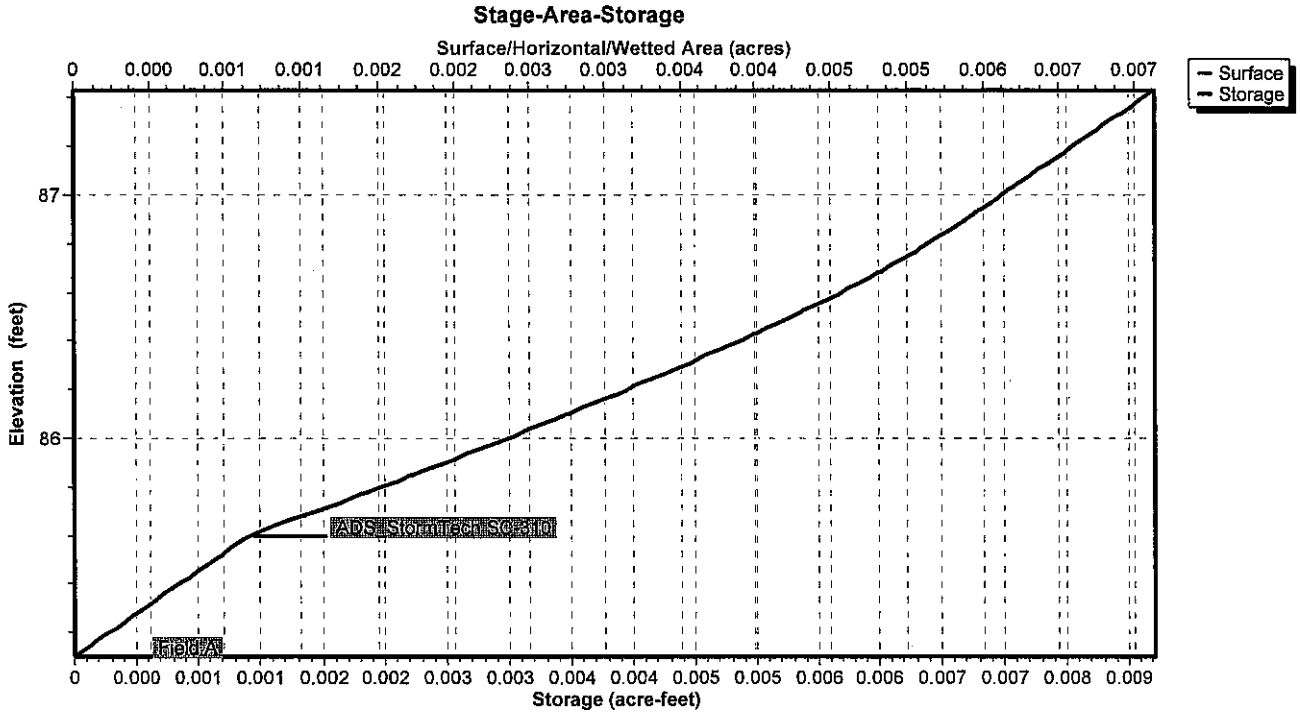
Pond INF-1: Infiltration System # 1



Pond INF-1: Infiltration System # 1



Pond INF-1: Infiltration System # 1



Summary for Pond INF-2: Infiltration System # 2

Inflow Area = 0.288 ac, 95.49% Impervious, Inflow Depth = 4.61" for 10 YR event
Inflow = 1.28 cfs @ 12.10 hrs, Volume= 0.111 af
Outflow = 1.21 cfs @ 12.14 hrs, Volume= 0.110 af, Atten= 5%, Lag= 2.4 min
Discarded = 0.00 cfs @ 12.14 hrs, Volume= 0.006 af
Primary = 1.21 cfs @ 12.14 hrs, Volume= 0.104 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 86.91' @ 12.14 hrs Surf.Area= 0.010 ac Storage= 0.010 af

Plug-Flow detention time= 100.6 min calculated for 0.110 af (99% of inflow)
Center-of-Mass det. time= 96.0 min (851.6 - 755.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	85.10'	0.007 af	**8.17'W x 52.28'L x 2.33'H Field A** 0.023 af Overall - 0.005 af Embedded = 0.018 af x 40.0% Voids
#2A	85.60'	0.005 af	**ADS_StormTech SC-310** x 14 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 2.07 sf x 2 rows
		0.012 af	Total Available Storage

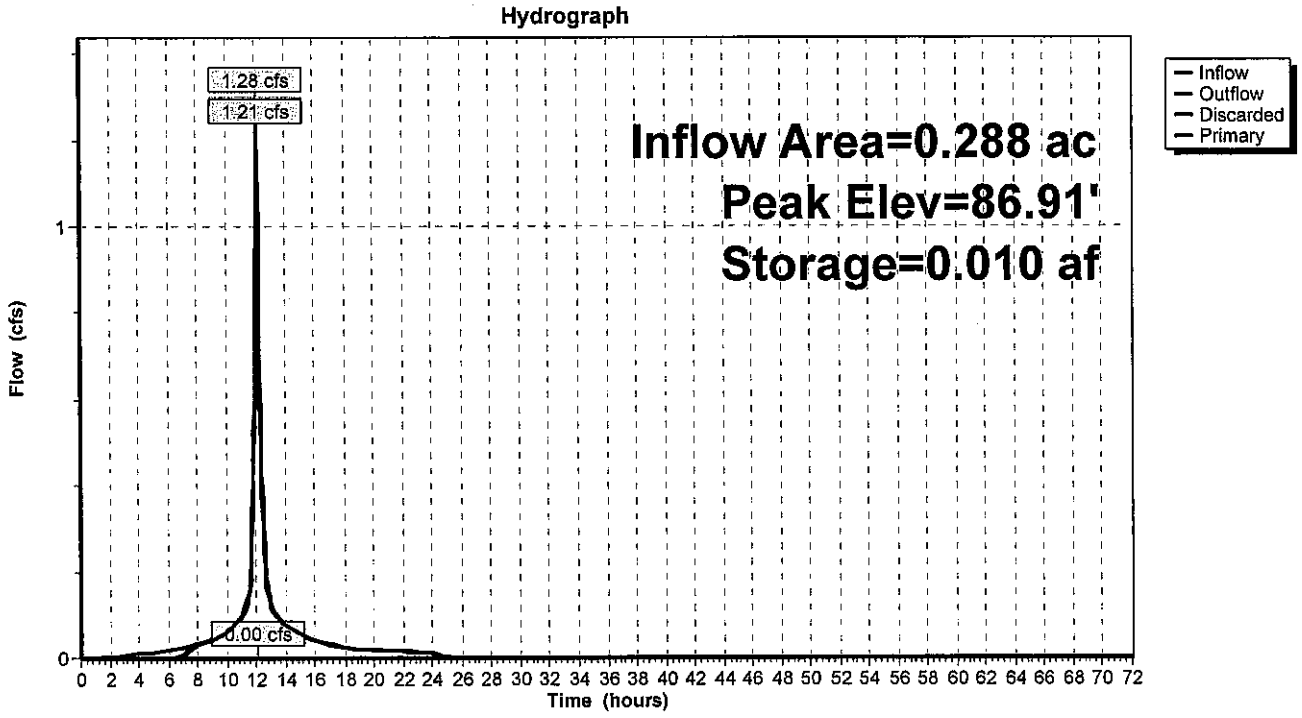
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	85.10'	**0.060 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 84.00'
#2	Primary	85.95'	**8.0" Round Culvert** L= 10.0' Ke= 0.020 Inlet / Outlet Invert= 85.95' / 85.95' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf

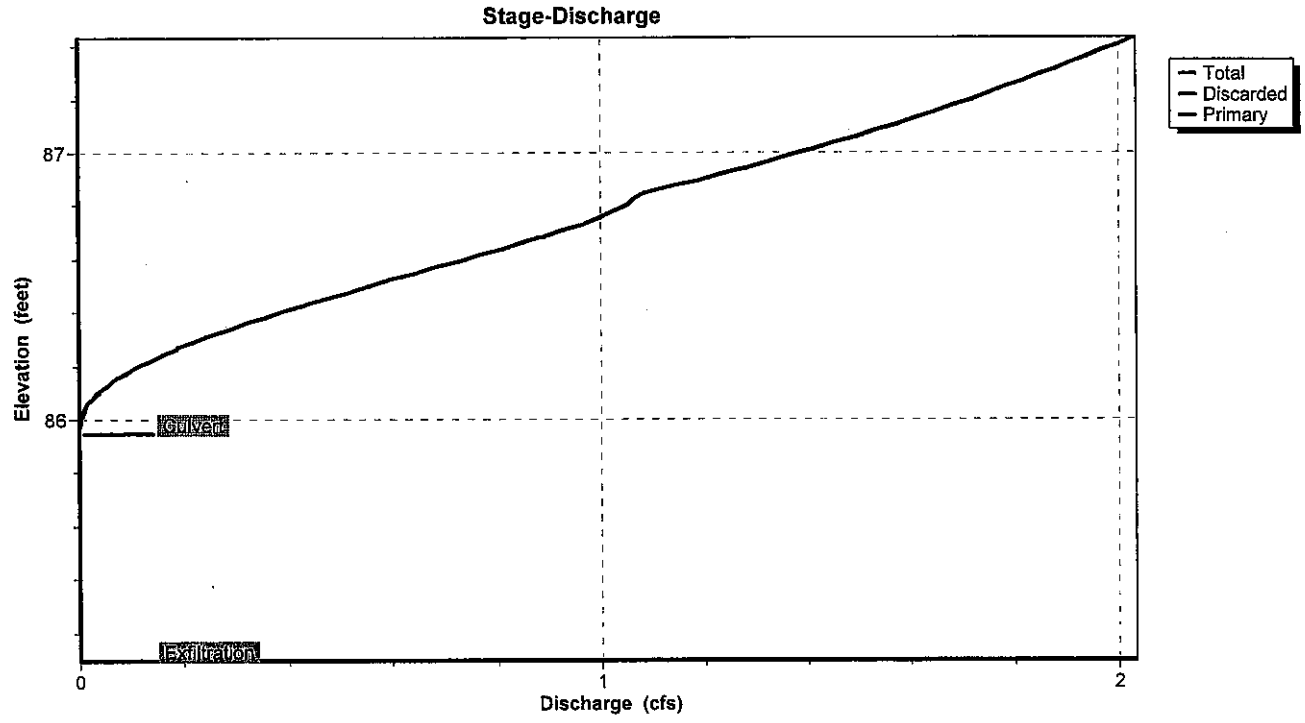
Discarded OutFlow Max=0.00 cfs @ 12.14 hrs HW=86.90' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=1.19 cfs @ 12.14 hrs HW=86.90' (Free Discharge)
↑—**2=Culvert** (Barrel Controls 1.19 cfs @ 3.42 fps)

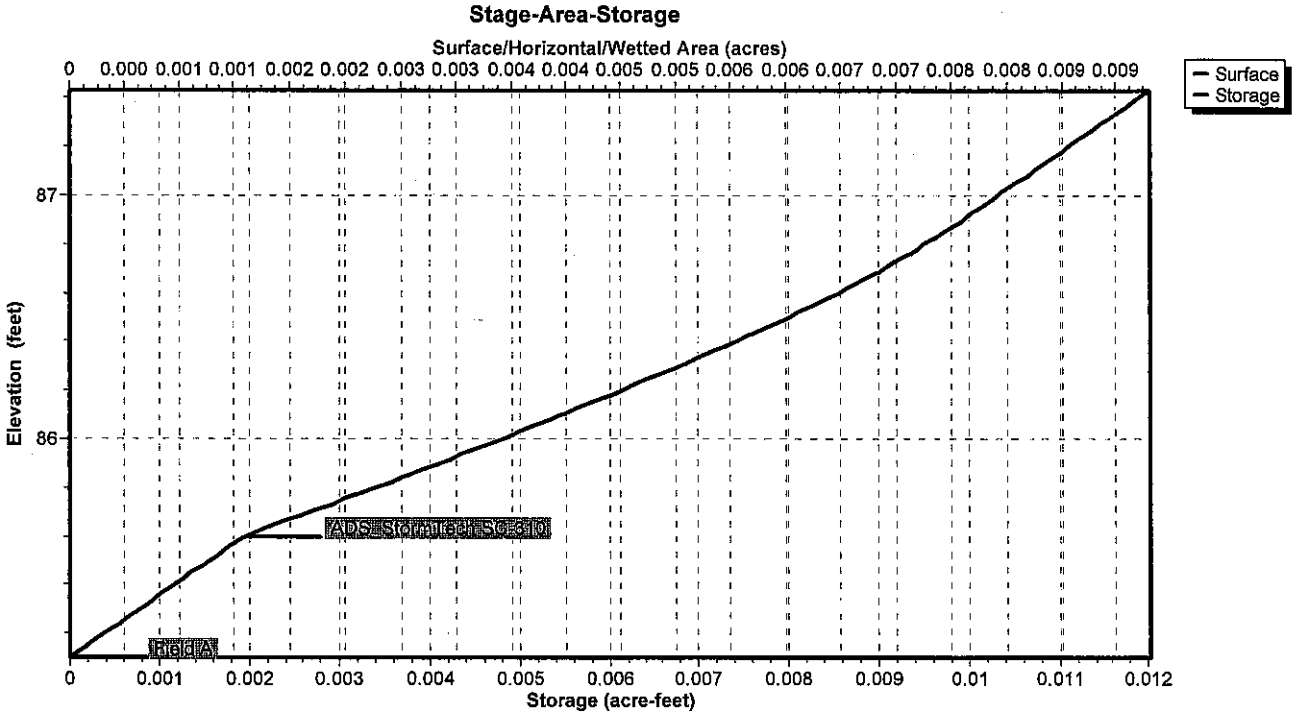
Pond INF-2: Infiltration System # 2



Pond INF-2: Infiltration System # 2



Pond INF-2: Infiltration System # 2



Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.202	80	>75% Grass cover, Good, HSG D (SC # 1, SC # 2, UA-1)
0.110	98	Impervious (SC # 1, UA-1)
0.215	98	Paved parking, HSG D (SC # 2)
0.120	98	Roof (R-1, R-2)
0.647	92	TOTAL AREA

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.417	HSG D	SC # 1, SC # 2, UA-1
0.230	Other	R-1, R-2, SC # 1, UA-1
0.647		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	0.000	0.202	0.000	0.202	>75% Grass cover, Good	SC # 1, SC # 2, UA-1
0.000	0.000	0.000	0.000	0.110	0.110	Impervious	SC # 1, UA-1
0.000	0.000	0.000	0.215	0.000	0.215	Paved parking	SC # 2
0.000	0.000	0.000	0.000	0.120	0.120	Roof	R-1, R-2
0.000	**0.000**	**0.000**	**0.417**	**0.230**	**0.647**	**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	INF-1	85.95	85.95	10.0	0.0000	0.013	8.0	0.0	0.0
2	INF-2	85.95	85.95	10.0	0.0000	0.013	8.0	0.0	0.0

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment R-1: 1/2 ROOF Runoff Area=0.060 ac 100.00% Impervious Runoff Depth=5.96"
Tc=5.0 min CN=98 Runoff=0.37 cfs 0.030 af

Subcatchment R-2: 1/2 ROOF Runoff Area=0.060 ac 100.00% Impervious Runoff Depth=5.96"
Tc=5.0 min CN=98 Runoff=0.37 cfs 0.030 af

Subcatchment SC # 1: West Parking Lot Runoff Area=0.111 ac 89.19% Impervious Runoff Depth=5.73"
Tc=8.0 min CN=96 Runoff=0.62 cfs 0.053 af

Subcatchment SC # 2: South Parking Lot Runoff Area=0.228 ac 94.30% Impervious Runoff Depth=5.84"
Tc=8.0 min CN=97 Runoff=1.27 cfs 0.111 af

Subcatchment UA-1: Undetained Area Runoff Area=0.188 ac 5.85% Impervious Runoff Depth=4.07"
Flow Length=100' Slope=0.0080 '/' Tc=14.1 min CN=81 Runoff=0.69 cfs 0.064 af

Reach D-1: DESIGN POINT 1 Inflow=3.08 cfs 0.276 af
Outflow=3.08 cfs 0.276 af

Pond DMH - 2: Outlet Control Manhole - DMH-2 Inflow=2.49 cfs 0.212 af
Primary=2.49 cfs 0.212 af

Pond INF-1: Infiltration System # 1 Peak Elev=86.71' Storage=0.007 af Inflow=0.96 cfs 0.083 af
Discarded=0.00 cfs 0.004 af Primary=0.93 cfs 0.078 af Outflow=0.93 cfs 0.082 af

Pond INF-2: Infiltration System # 2 Peak Elev=87.09' Storage=0.011 af Inflow=1.62 cfs 0.141 af
Discarded=0.00 cfs 0.006 af Primary=1.55 cfs 0.134 af Outflow=1.55 cfs 0.140 af

Total Runoff Area = 0.647 ac Runoff Volume = 0.287 af Average Runoff Depth = 5.33"
31.22% Pervious = 0.202 ac 68.78% Impervious = 0.445 ac

Summary for Subcatchment R-1: 1/2 ROOF

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

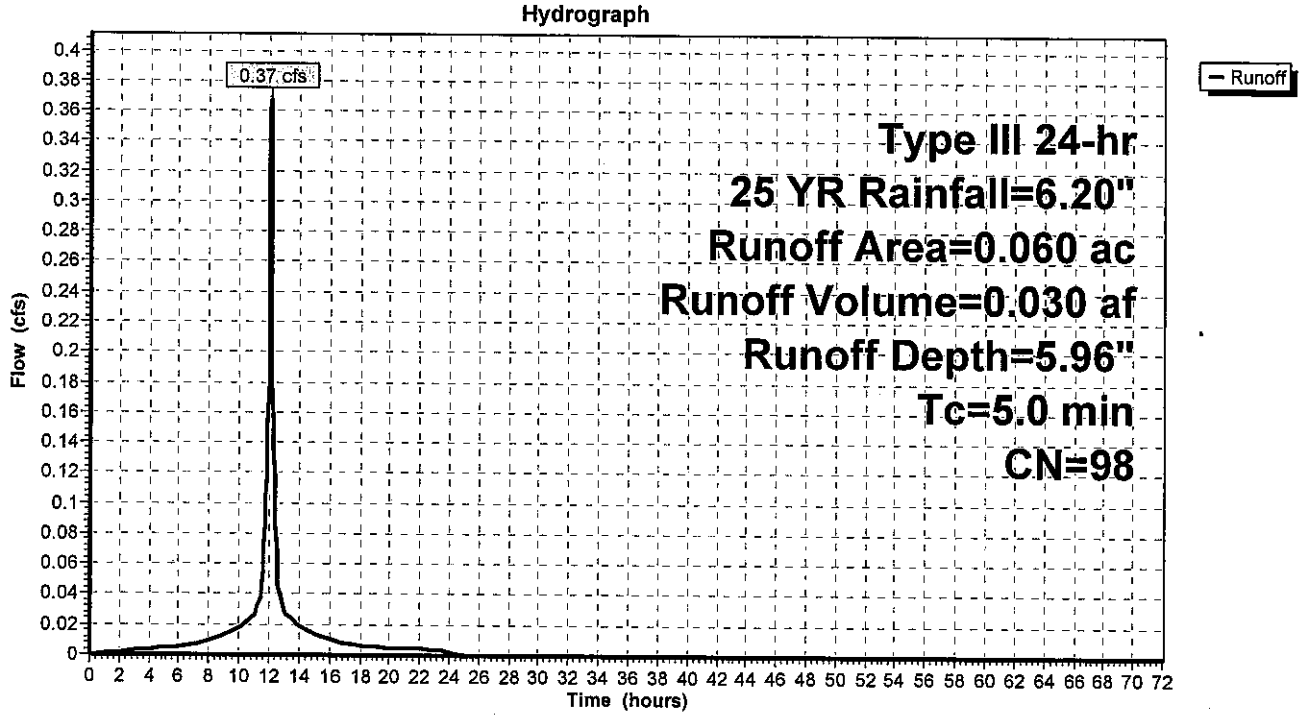
Runoff = 0.37 cfs @ 12.07 hrs, Volume= 0.030 af, Depth= 5.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=6.20"

	Area (ac)	CN	Description
*	0.060	98	Roof
	0.060		100.00% Impervious Area

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

Subcatchment R-1: 1/2 ROOF



Summary for Subcatchment R-2: 1/2 ROOF

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

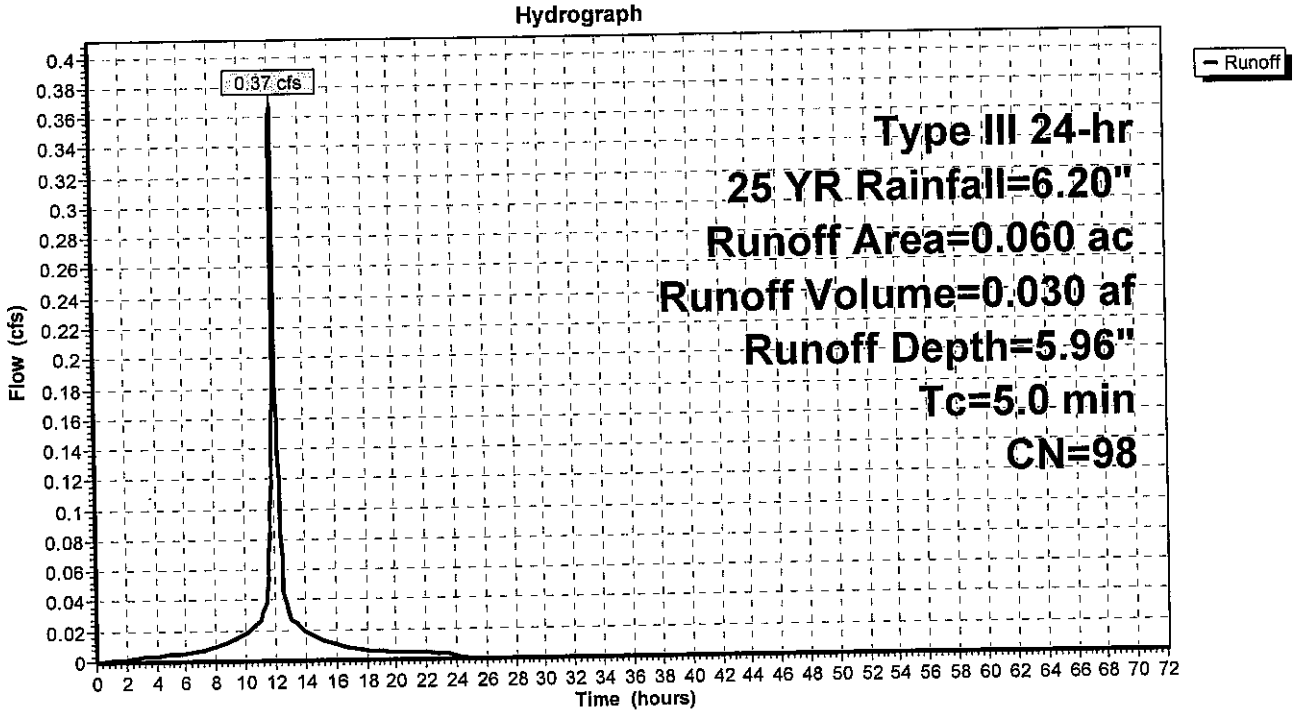
Runoff = 0.37 cfs @ 12.07 hrs, Volume= 0.030 af, Depth= 5.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=6.20"

	Area (ac)	CN	Description
*	0.060	98	Roof
	0.060		100.00% Impervious Area

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

Subcatchment R-2: 1/2 ROOF



Summary for Subcatchment SC # 1: West Parking Lot

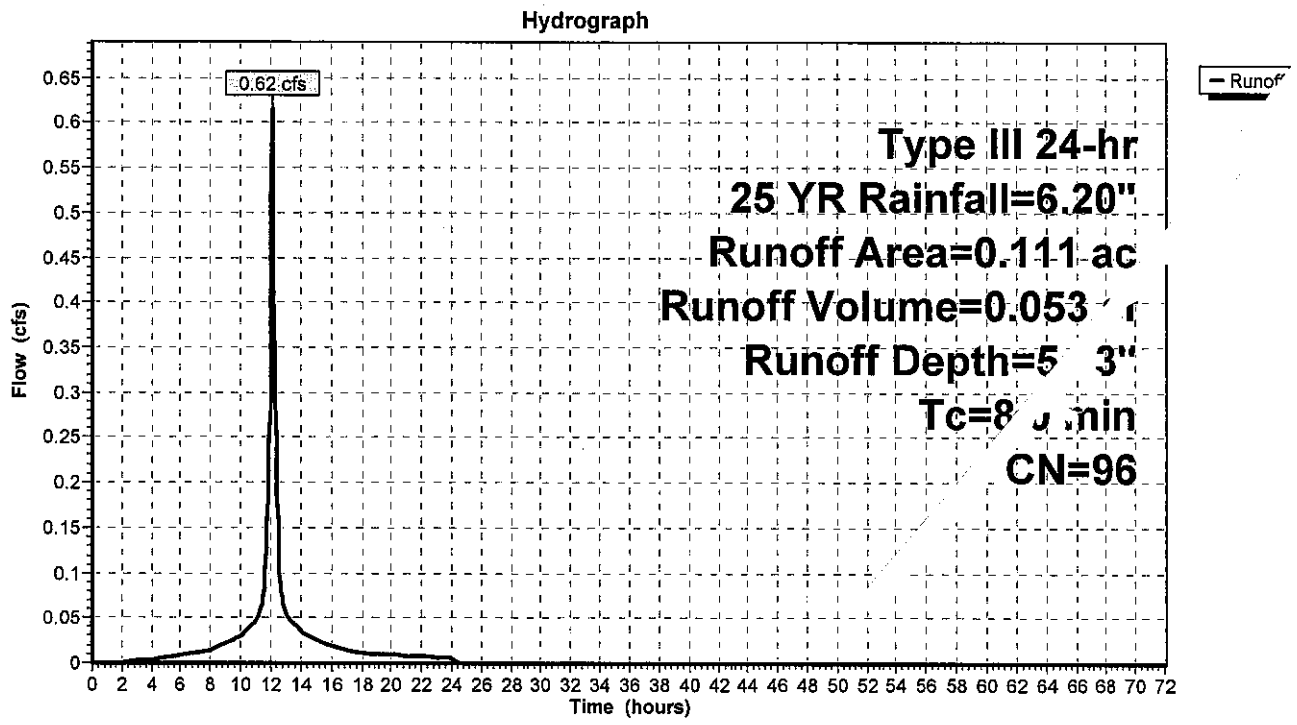
Runoff = 0.62 cfs @ 12.11 hrs, Volume= 0.053 af, Depth= 5.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=6.20"

	Area (ac)	CN	Description
*	0.099	98	Impervious
	0.012	80	>75% Grass cover, Good, HSG D
	0.111	96	Weighted Average
	0.012		10.81% Pervious Area
	0.099		89.19% Impervious Area

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

Subcatchment SC # 1: West Parking Lot



Summary for Subcatchment SC # 2: South Parking Lot

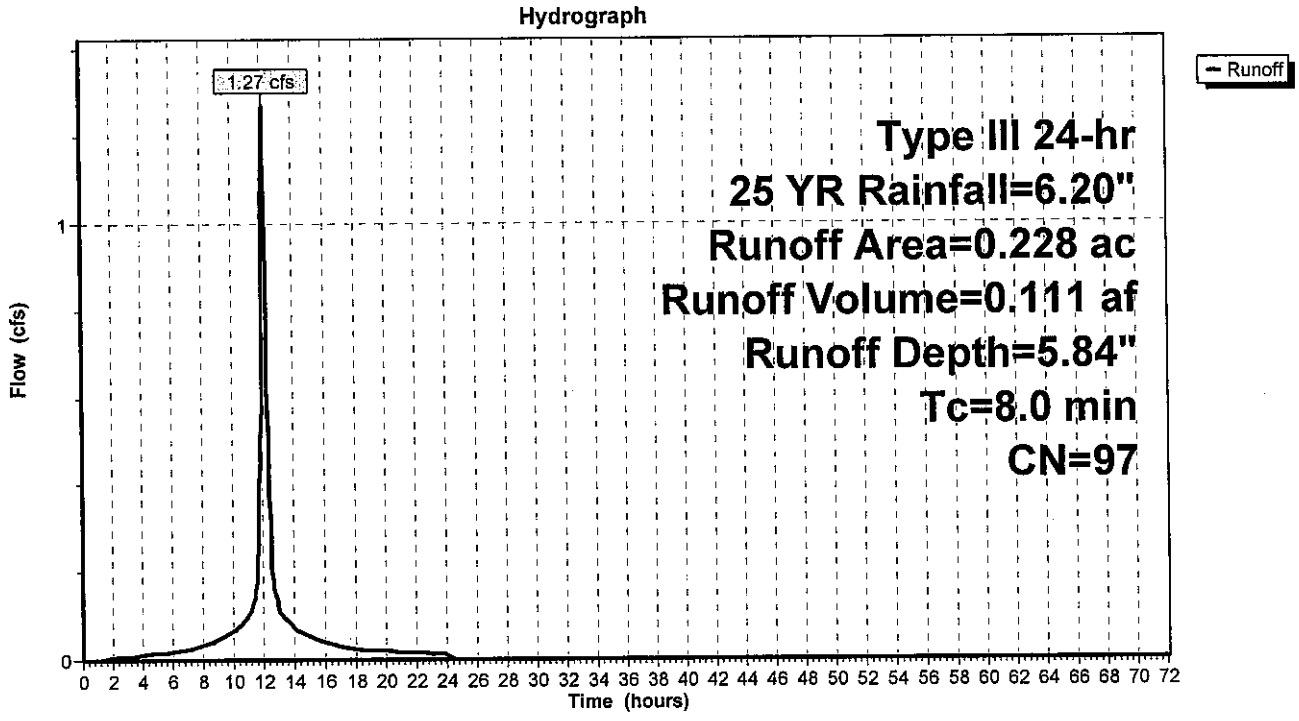
Runoff = 1.27 cfs @ 12.11 hrs, Volume= 0.111 af, Depth= 5.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=6.20"

Area (ac)	CN	Description
0.215	98	Paved parking, HSG D
0.013	80	>75% Grass cover, Good, HSG D
0.228	97	Weighted Average
0.013		5.70% Pervious Area
0.215		94.30% Impervious Area

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

Subcatchment SC # 2: South Parking Lot



Summary for Subcatchment UA-1: Undetained Area

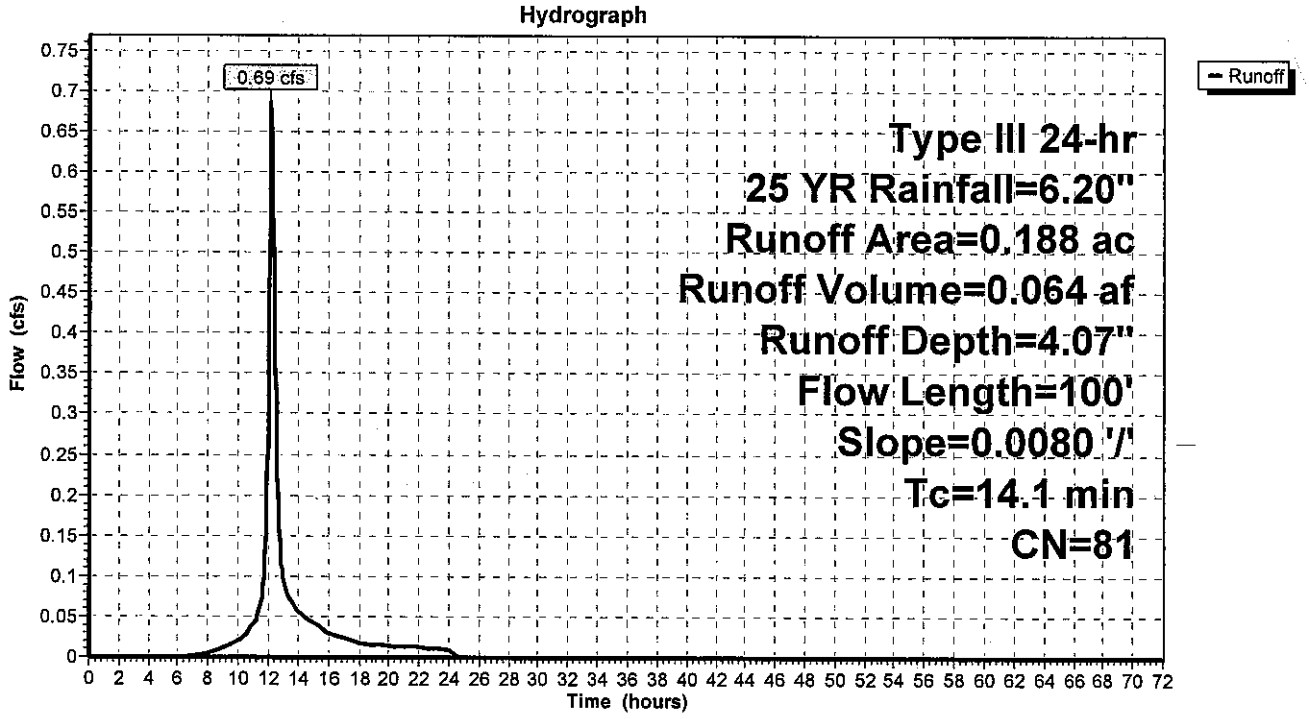
Runoff = 0.69 cfs @ 12.19 hrs, Volume= 0.064 af, Depth= 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=6.20"

	Area (ac)	CN	Description
*	0.011	98	Impervious
	0.177	80	>75% Grass cover, Good, HSG D
	0.188	81	Weighted Average
	0.177		94.15% Pervious Area
	0.011		5.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0080	0.12		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.20"

Subcatchment UA-1: Undetained Area



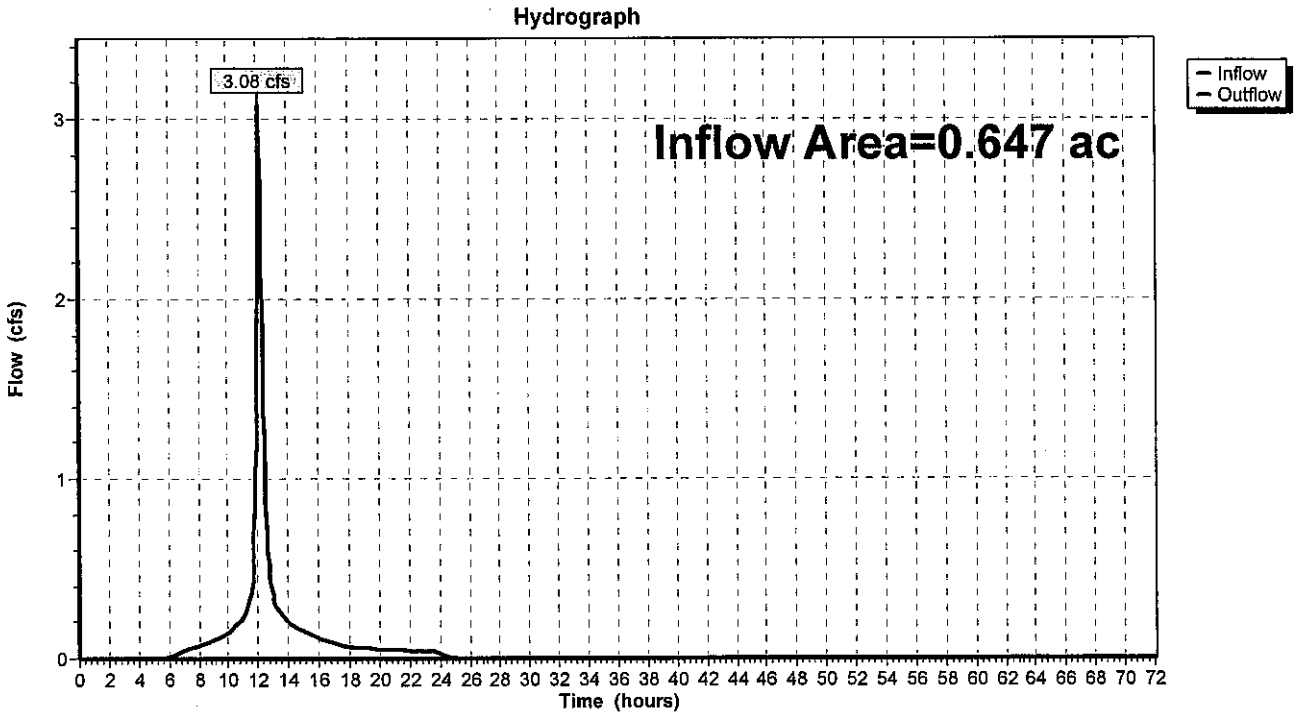
Summary for Reach D-1: DESIGN POINT 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.647 ac, 68.78% Impervious, Inflow Depth = 5.11" for 25 YR event
Inflow = 3.08 cfs @ 12.14 hrs, Volume= 0.276 af
Outflow = 3.08 cfs @ 12.14 hrs, Volume= 0.276 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach D-1: DESIGN POINT 1



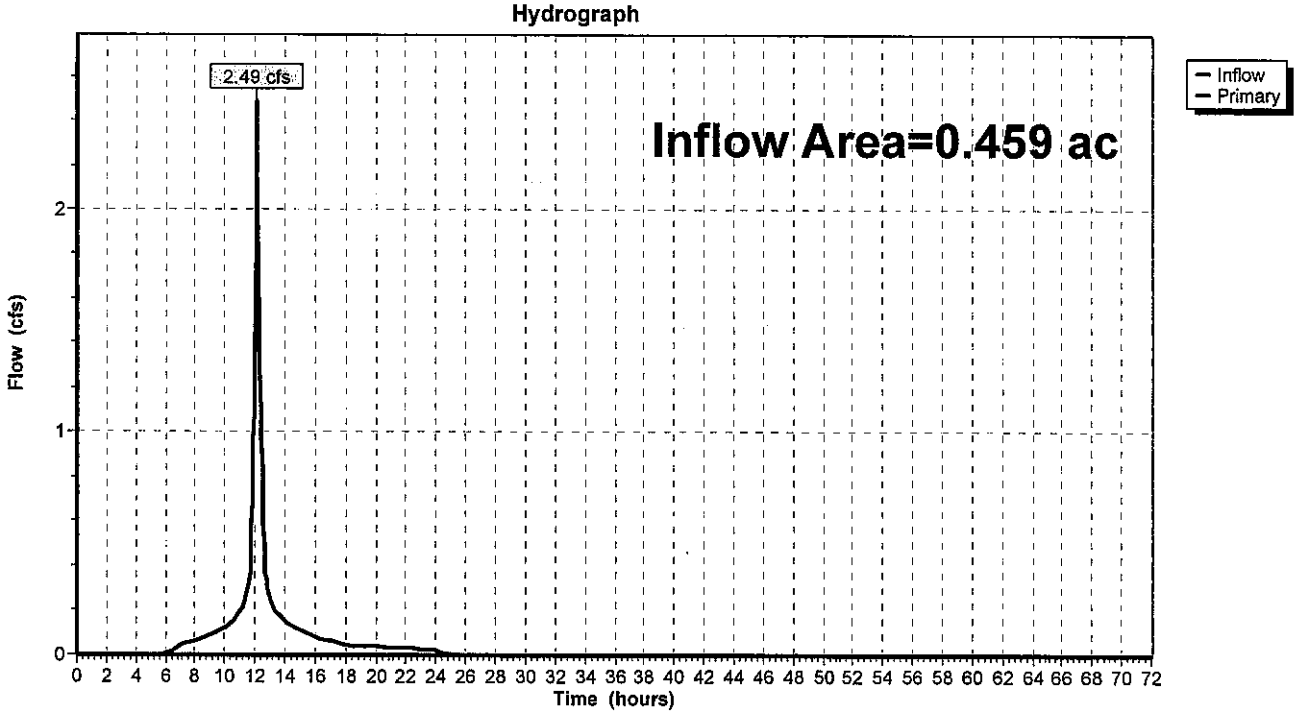
Summary for Pond DMH - 2: Outlet Control Manhole - DMH-2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.459 ac, 94.55% Impervious, Inflow Depth = 5.54" for 25 YR event
Inflow = 2.49 cfs @ 12.12 hrs, Volume= 0.212 af
Primary = 2.49 cfs @ 12.12 hrs, Volume= 0.212 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Pond DMH - 2: Outlet Control Manhole - DMH-2



Summary for Pond INF-1: Infiltration System # 1

Inflow Area = 0.171 ac, 92.98% Impervious, Inflow Depth = 5.81" for 25 YR event
Inflow = 0.96 cfs @ 12.10 hrs, Volume= 0.083 af
Outflow = 0.93 cfs @ 12.12 hrs, Volume= 0.082 af, Atten= 4%, Lag= 1.5 min
Discarded = 0.00 cfs @ 12.12 hrs, Volume= 0.004 af
Primary = 0.93 cfs @ 12.12 hrs, Volume= 0.078 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 86.71' @ 12.12 hrs Surf.Area= 0.007 ac Storage= 0.007 af

Plug-Flow detention time= 96.6 min calculated for 0.082 af (99% of inflow)
Center-of-Mass det. time= 92.4 min (846.1 - 753.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	85.10'	0.005 af	**8.17'W x 38.04'L x 2.33'H Field A** 0.017 af Overall - 0.003 af Embedded = 0.013 af x 40.0% Voids
#2A	85.60'	0.003 af	**ADS_StormTech SC-310** x 10 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 2.07 sf x 2 rows
		0.009 af	Total Available Storage

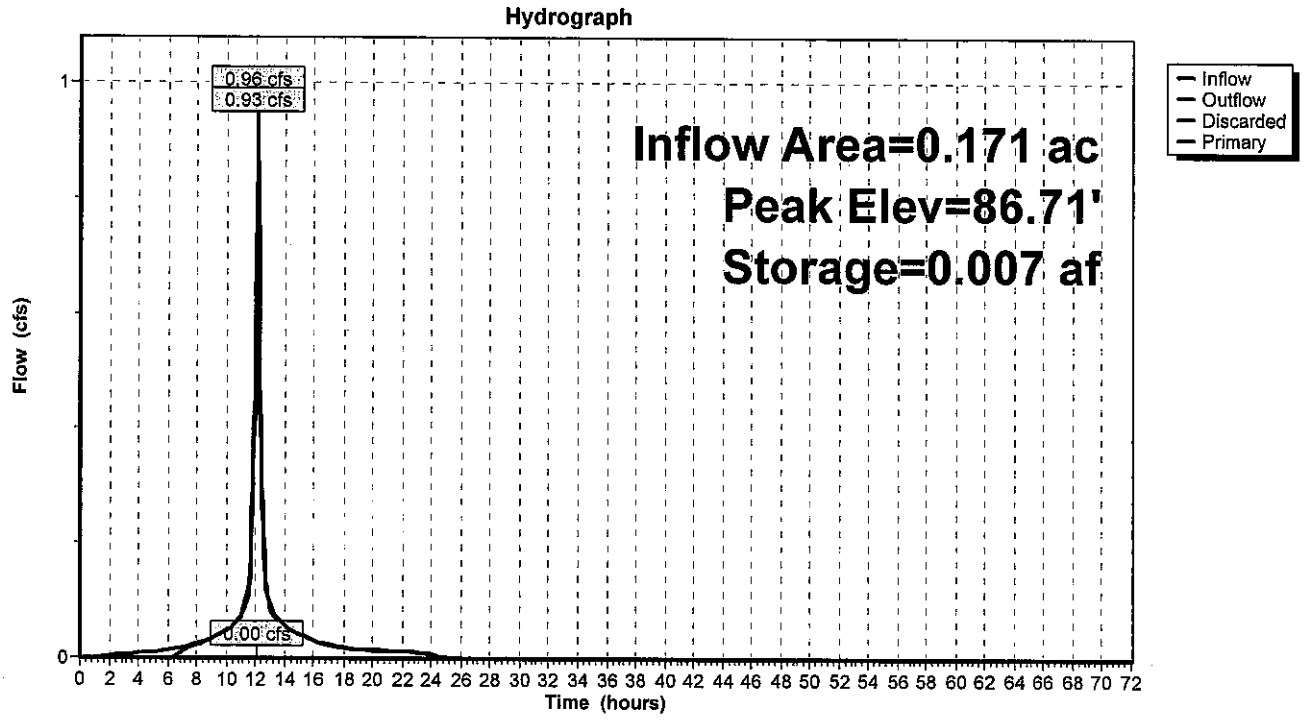
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	85.10'	**0.060 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 84.00'
#2	Primary	85.95'	**8.0" Round Culvert** L= 10.0' Ke= 0.020 Inlet / Outlet Invert= 85.95' / 85.95' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf

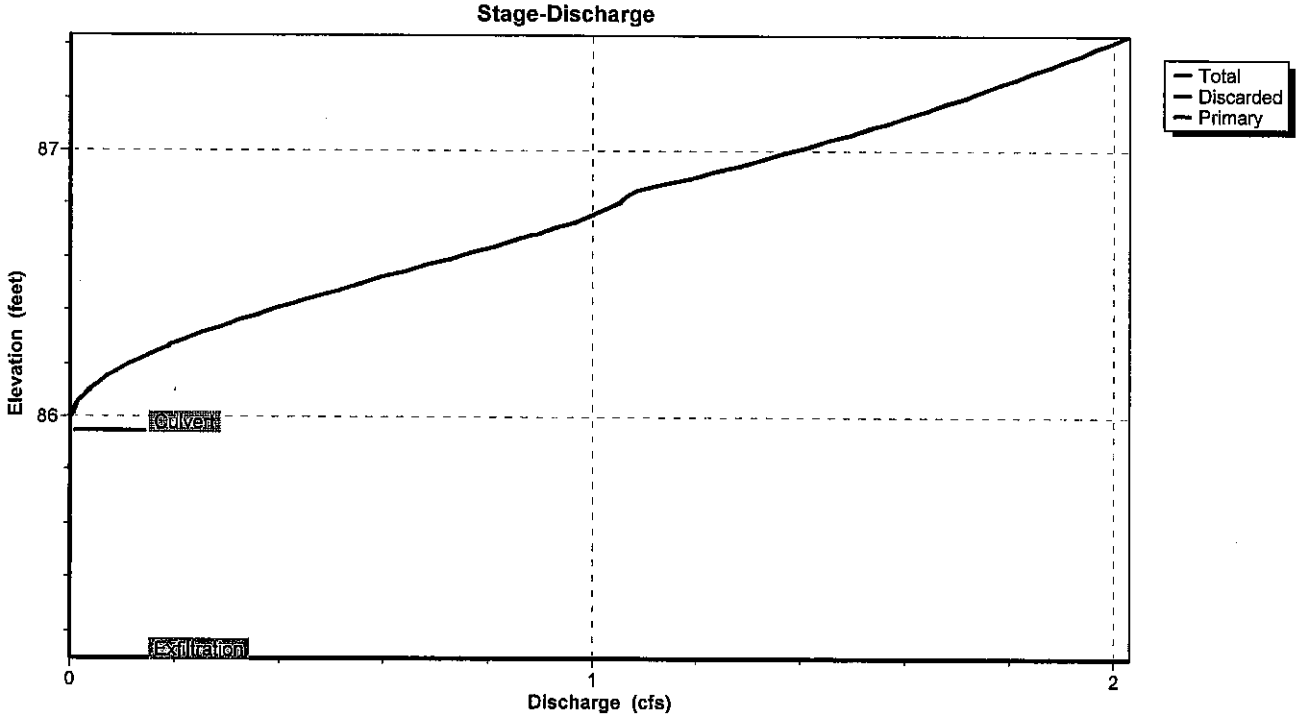
Discarded OutFlow Max=0.00 cfs @ 12.12 hrs HW=86.69' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.90 cfs @ 12.12 hrs HW=86.69' (Free Discharge)
↑—**2=Culvert** (Barrel Controls 0.90 cfs @ 2.89 fps)

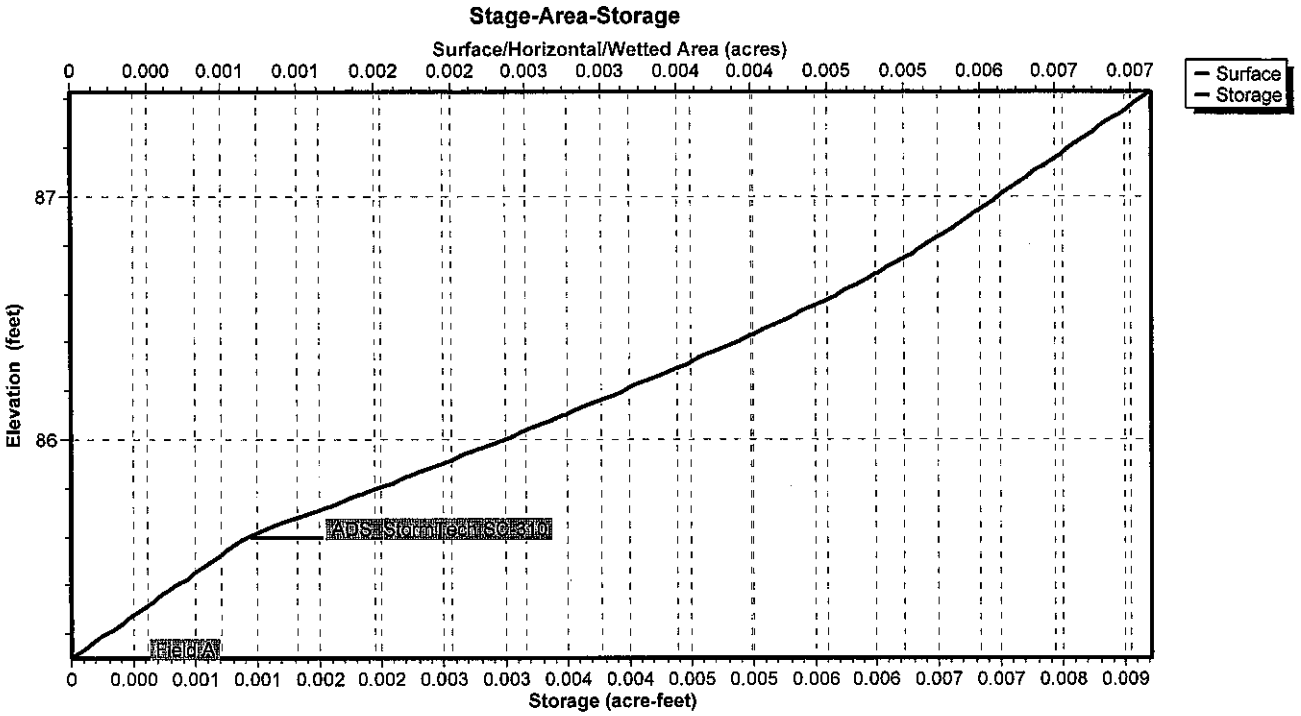
Pond INF-1: Infiltration System # 1



Pond INF-1: Infiltration System # 1



Pond INF-1: Infiltration System # 1



Summary for Pond INF-2: Infiltration System # 2

Inflow Area = 0.288 ac, 95.49% Impervious, Inflow Depth = 5.87" for 25 YR event
Inflow = 1.62 cfs @ 12.10 hrs, Volume= 0.141 af
Outflow = 1.55 cfs @ 12.13 hrs, Volume= 0.140 af, Atten= 4%, Lag= 1.5 min
Discarded = 0.00 cfs @ 12.13 hrs, Volume= 0.006 af
Primary = 1.55 cfs @ 12.13 hrs, Volume= 0.134 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 87.09' @ 12.13 hrs Surf.Area= 0.010 ac Storage= 0.011 af

Plug-Flow detention time= 83.4 min calculated for 0.140 af (99% of inflow)
Center-of-Mass det. time= 78.2 min (829.5 - 751.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	85.10'	0.007 af	**8.17'W x 52.28'L x 2.33'H Field A** 0.023 af Overall - 0.005 af Embedded = 0.018 af x 40.0% Voids
#2A	85.60'	0.005 af	**ADS_StormTech SC-310** x 14 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 2.07 sf x 2 rows
		0.012 af	Total Available Storage

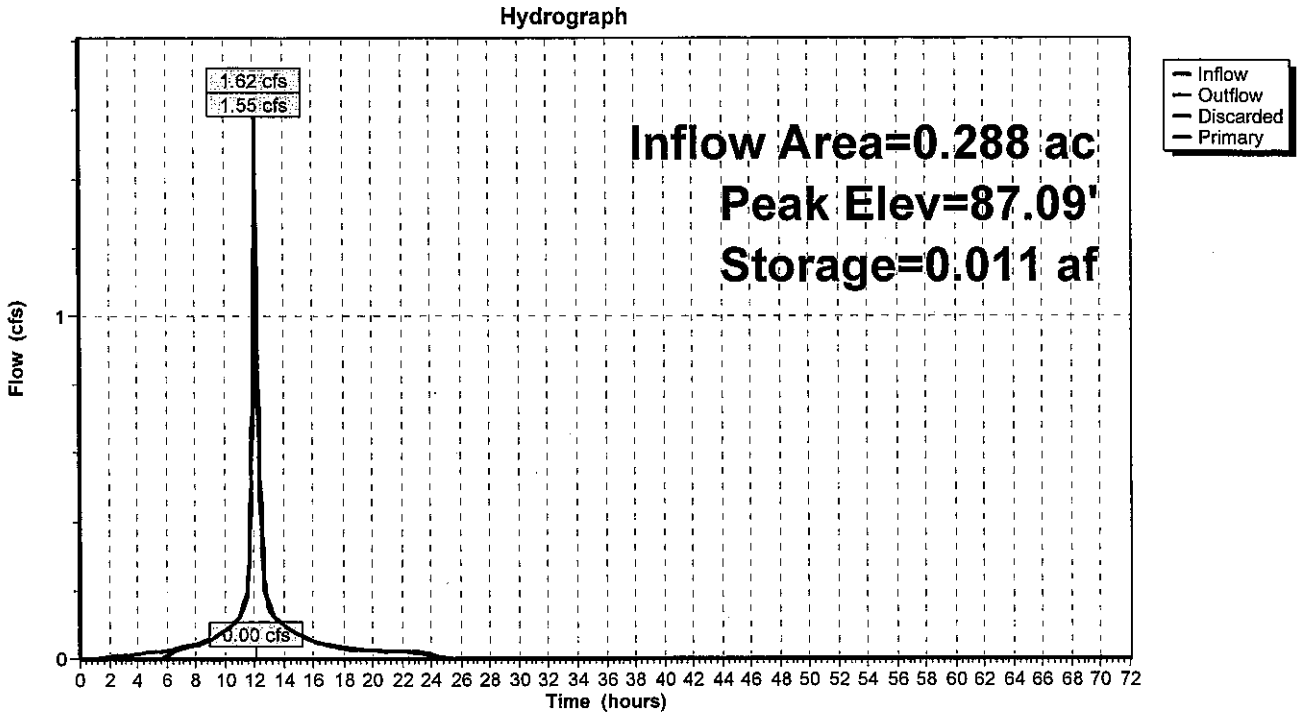
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	85.10'	**0.060 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 84.00'
#2	Primary	85.95'	**8.0" Round Culvert** L= 10.0' Ke= 0.020 Inlet / Outlet Invert= 85.95' / 85.95' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf

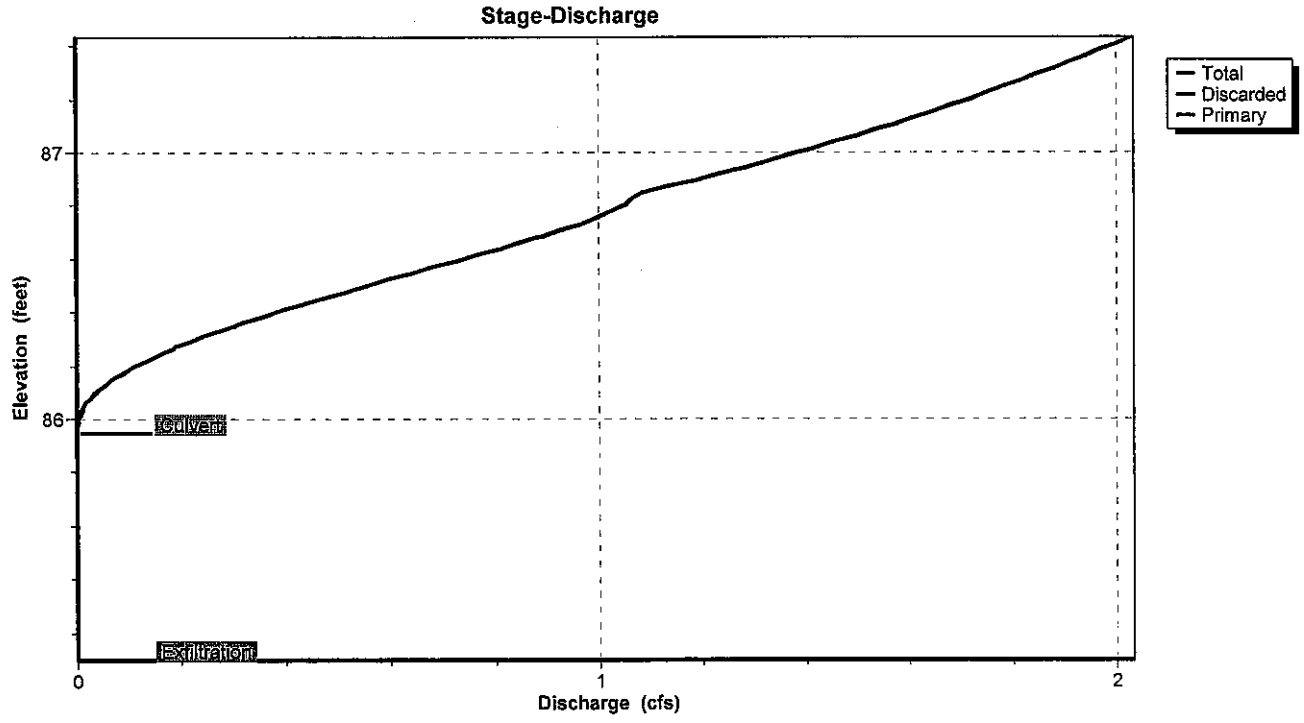
Discarded OutFlow Max=0.00 cfs @ 12.13 hrs HW=87.07' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=1.51 cfs @ 12.13 hrs HW=87.07' (Free Discharge)
↑—**2=Culvert** (Barrel Controls 1.51 cfs @ 4.33 fps)

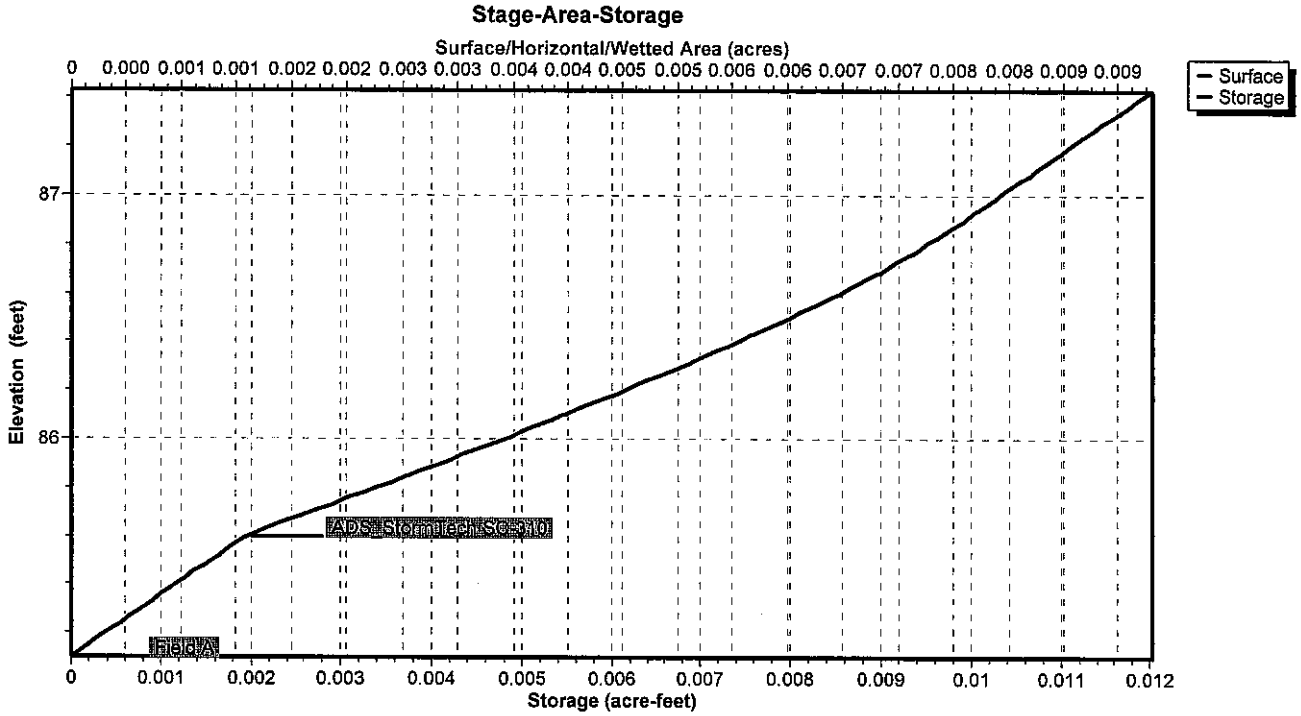
Pond INF-2: Infiltration System # 2



Pond INF-2: Infiltration System # 2



Pond INF-2: Infiltration System # 2



Appendix C

Total Suspended Solids Calculations (TSS)

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: New Bedford, Massachustts

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Subsurface Infiltration Structure	0.80	1.00	0.80	0.20
Deep Sump and Hooded Catch Basin	0.25	0.20	0.05	0.15
Street Sweeping - 10%	0.10	0.15	0.02	0.14
	0.00	0.14	0.00	0.14
	0.00	0.14	0.00	0.14

Total TSS Removal = 87%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: Silva's Gym
Prepared By: GOR
Date: 1/23/2017

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

Appendix D

SOILS MAP

Soil Map—Bristol County, Massachusetts, Southern Part

Map Scale: 1:1,010 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 45 90 180 270

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bristol County, Massachusetts, Southern Part
Survey Area Data: Version 10, Sep 14, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 30, 2011—Oct 8, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Bristol County, Massachusetts, Southern Part (MA603)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
307B	Paxton fine sandy loam, 0 to 8 percent slopes, extremely stony	1.5	30.1%
311B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	0.4	7.6%
602	Urban land	3.0	62.2%
Totals for Area of Interest		**4.9**	**100.0%**

Appendix E

Recharge Volume Calculations

RECHARGE VOLUME CALCULATIONS

Project: ECEL BRAZILIAN JIU JITSU GYM
Location: New Bedford, Massachusetts
Calc. by: GOR Date: 1/23/17

Recharge Volume (REv) Project Area:

REv (Cubic Feet)+ Impervious Area (S.F.) X 1 in. X Recharge Factor X 1 Ft. / 12 in.

Total Impervious Area= 19,610 S.F.

Recharge factor (Soil Type "D")= 0.10

Required REv (C.F.)= 19,610 S.F. X .10 x 1 Ft./ 12 in. = 164 C.F.

TOTAL VOLUME REQUIRED= 164 C.F.

TOTAL VOLUME PROVIDED: (174+217)= 391 C.F. *

Volume Provided (391 C.F.) is greater than the Volume Required (164 C.F.)

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*From 2 Year Storm PWS HydroCAD Model exfiltration (discarded) volumes:

INFILTRATION SYSTEM # 1= (.004Ac. Ft X 43,560 Ac/S.F.)= 174 C.F.

INFILTRATION SYSTEM # 2= (.005 Ac. Ft X 43,560 Ac/S.F.)= 217 C.F.

Appendix F

Water Quality Volume Calculations

0.5 " WATER QUALITY CALCULATIONS

Project: ECEL BRAZILIAN JIU JITSU GYM
Location: New Bedford, Massachusetts
Calc. by: GOR Date: 1/23/17

SUBCATCHMENT AREA #1
Water Quality Volume (WQv) SC-1

WQv (Cubic Feet)= Impervious Area (S.F.) X 0.5 in. X 1 Ft. / 12 in.
WQv (Cubic Feet)=0 .110 Ac X 43,560 S.F./Acre X 0.5 in / 12 in
WQv (Cubic Feet)= 200 C.F.

- ***Volume Provided= 324 C.F.* is Greater Than Volume Required= 200 C.F.***

SUBCATCHMENT AREA #2
Water Quality Volume (WQv) SC-2

WQv (Cubic Feet)= Impervious Area (S.F.) X 0.5 in. X 1 Ft. / 12 in.
WQv (Cubic Feet)= 0.215 Ac X 43,560 S.F./Acre X 0.5 in / 12 in
WQv (Cubic Feet)= 390 C.F.

- ***Volume Provided= 455C.F. ** is Greater Than Volume Required= 390 C.F.***

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*

Total Volume Provided:
(STC 450i= 62.8 C.F.) + (Inf. System #1= 0.006 AC-ft X 43,560 S.F.= 261 C.F.) = 324 C.F.

* *

Total Volume Provided:
(STC 450i= 62.8 C.F.) +(Inf. System #2= 0.009 AC-ft X 43,560 S.F. = 392 C.F.)= 455 C.F.

Department of Public Infrastructure

Euzebio Arruda
Commissioner

Water
Wastewater
Highways
Engineering
Cemeteries
Park Maintenance
Forestry
Energy

CITY OF NEW BEDFORD
Jonathan F. Mitchell, Mayor

MEMORANDUM

To: City of New Bedford Planning Board

From: Euzebio Arruda, Commissioner, DPI

Date: February 21, 2017

RE: XCEL Brazillian Jiu Jitsu- Site Plan
Chaffee Street – Plot 130G Lots 22,44,42,43 &44

The Department of Public Infrastructure has reviewed the proposed site plan referenced above and recommends approval with the following conditions:

1. Driveway permits are subject to Traffic Commission approval.
2. Permits for sidewalk, driveway, water, sewer and drainage must be obtained from the Department of Public Infrastructure Engineering Division.
3. Install granite curb on Chaffee St. between proposed wheelchair ramp and the proposed driveway.
4. Driveway to be built in accordance with City of New Bedford regulations and with 4 foot transition curb on the east side.
5. Add 3 trees to the Chaffee St. sidewalk area.
6. This site plan includes 5 different lots. Owner to provide copy of recorded plan for combining the parcels.
7. All utilities to be installed in accordance with City of New Bedford standards.
8. Owner must install sewer clean out, on the proposed service, within the city layout.
9. Owner must contact the Department of Public Infrastructure Engineering Division to assign a new address for the proposed building.
10. Revise the "Pavement Section Detail" to show a 2 ½" binder course.

11. The Department of Public Infrastructure requires a final set of approval plans to be submitted that reflects all revisions made prior to the start of construction.
12. Developer and site contactor must schedule a pre- construction meeting with the Department of Public Infrastructure prior to the start of construction.
13. Upon completion, Engineer must submit "As Built Drawings" in CADD format prior to the Certificate of Occupancy being issued.

CC: Department of Inspectional Services
Environmental Stewardship
Boucher & Heureux, Inc.
Marcio Silva