Town of Mashpee
Plannina Board
16 Great Neck Road North
Mashpee, Massachusetts 02649

Meeting of the Mashpee Planning Board
Wednesday, July 1, 2020
Waquoit Meeting Room
Mashpee Town Hall
16 Great Neck Road North
Mashpee, MA 02649
7:00 PM

Virtual / Remote Meeting
Broadcast Live on Local Channel 18
Call in Conference Number: 508-539-1400 extension 8585
Streamed Live on the Town of Mashpee Website: https://www.mashpeema.gov/channel-18

Call Meeting to Order

- Pledge of Allegiance

Reorganization of Board Officers

Board Representatives and Assignments to Committees, Commissions and Boards

Approval of Minutes

- Review of meeting minutes from June 17, 2020

Public Hearings

7:10 PM – Southworth Mashpee Properties LLC

Pursuant to Massachusetts General Laws, Chapter 40A Section 11, the Mashpee Planning Board will hold a public hearing on Wednesday, June 17, 2020 at 7:10PM at the Mashpee Town Hall, 16 Great Neck Road North, to consider an application from Southworth Mashpee Properties LLC, property owner, to modify the Willowbend Country Club Special Permit. The applicant proposes to construct a 6-unit multifamily residential townhouse structure to be known as the Clubhouse Villas on a 40,009 square foot parcel located north of Quinaquisset Avenue and found on Assessors Map 69 Block 117.

New Business

- C. Rowley Billing – June 2020

Town Planner Report

- Update to Subdivision Rules and Regulations and Special Permit Regulations
- Stormwater Task Force

Consulting Engineer's Report

- Cape Cod Coffee Update

Town of Mashpee
16 Great Neck Road North
Mashpee, Massachusetts 02649

Correspondence

- Pierce Atwood – Re: South Cape Village – Notice of Intent to Sell and Transfer Special Permit
- Falmouth Board of Appeals Notices
- May 2020 Discharge Monitoring Report for South Cape Village – N = 5.1
- April 2020 Discharge Monitoring Report for South Cape Village – Plant met all permit effluent discharge requirements for April 2020. No influent sample was collected due to Whitewaters Safety Policy pertaining to COVID-19.
- March 2020 Discharge Monitoring Report for South Cape Village N= 6.0
- February 2020 Discharge Monitoring Report for South Cape Village N= 7.1
- January 2020 Discharge Monitoring Report for South Cape Village N=15.60
- December 2019 Discharge Monitoring Report for South Cape Village – No flow in December due to plant upgrade work
- November 2019 Discharge Monitoring Report for South Cape Village N= 4.52

Adjournment

Mashpee Planning Board
Minutes of Meeting
June 17, 2020 at 7:00 p.m.
Mashpee Town Hall-16 Great Neck Road North
Virtual/Remote Meeting-Call In (508) 539-1400 x8585
Broadcast Live on Local Channel 18

Present: Chairman Mary Waygan, Joe Cummings, Dennis Balzarini, John (Jack) Phelan, Joseph Callahan, Robert (Rob) Hansen (Alt.)
Also Present: Evan Lehrer-Town Planner, Charles Rowley-Consultant Engineer

CALL TO ORDER
The Chair welcomed attendees and read a statement regarding the order of Governor Baker suspending provisions of the Open Meeting Law issued March 12, 2020. The meeting was being live streamed and could be viewed at www.mashpeema.gov/channel18 . Viewers wishing to provide comment could call (508) 539-1400, extension 8585, to share public comment.

Attendance was taken by roll call with Mr. Balzarini, Mr. Cummings, Mr. Phelan, Mr. Callahan, Chairman Waygan and Mr. Hansen stating their presence. The Town of Mashpee Planning Board meeting was opened by Chairman Waygan, with a quorum, by remote participation at 7:00 p.m. on Wednesday, June 17, 2020 and the Pledge of Allegiance was recited.

The Chair expressed thanks and appreciation to Mr. Cummings, whose term would be completed at the close of this meeting. The Chair thanked Mr. Cummings for his many years of dedication and hard work on the Planning Board. Committee members all expressed their thanks and appreciation to Mr. Cummings.

APPROVAL OF MINUTES—June 3, 2020
Corrections offered by both Mr. Rowley and Mr. Lehrer were considered and accepted by members of the Board.

MOTION: Mr. Balzarini made a motion to approve the minutes of June 3rd, 2020 as amended by Mr. Rowley and Mr. Lehrer. Mr. Callahan seconded the motion. Roll call vote: Mr. Balzarini-yes; Mr. Cummings-yes; Mr. Phelan-abstained; Mr. Callahan-yes; Chairman Waygan-yes

APPROVAL NOT REQUIRED
Applicant: Sakonnet Realty Trust and Paul & Donna Gardner
Location: 4 & 8 Sakonnet Drive, Mashpee (Assessor's Map 58, Parcels 23 & 29)
Request: Create two new registered unbuildable lots with court assigned numbers 2200 and 2202 along the shore of Johns Pond.
The Chair read the request and recognized Steve Doyle who discussed the application to create two unbuildable lots, lot 2199 and 2200. The Chair had no comments. Mr. Rowley confirmed that he had been in contact with the applicant and indicated his satisfaction, adding that the rights of others to pass and repass would be preserved. Lot 2043, with a dashed line was of no significance and had been established previously. There was discussion regarding prior ownership and it was believed that it was common ownership and Mr. Doyle confirmed that all persons lawfully holding rights to access would continue to have access. Mr. Doyle confirmed that the property would continue to be waterfront and the change was not intended for assessment purposes.

MOTION: Mr. Balzarini made a motion that the plan was an Approval Not Required. Mr. Cummings seconded the motion. Roll call vote: Mr. Balzarini-yes; Mr. Cummings-yes; Mr. Phelan-yes; Mr. Callahan-yes; Chairman Waygan-yes

The Chair reminded the Board that Mr. Lehrer was authorized to sign the plan. Mr. Lehrer confirmed that authorization was recorded with Land Court.

NEW BUSINESS

OLD BUSINESS

South Cape Village-The Chair inquired about the status of new ownership of South Cape Village. Mr. Lehrer responded that he had sent a letter and learned that there would be no sale of the property at this time and he would include a copy of the letter in the next meeting's packet, as correspondence had been received after posting of the agenda.

CHAIRMAN'S REPORT

The Chair reported that, due to an error in abutter noticing, the Public Hearing needed to be re-advertised for the next meeting on July 1. Public comment for the Hearing would be taken by the advertised phone line.

MOTION: Mr. Balzarini made a motion to set the Public Hearing for Southworth Mashpee Properties LLC, July 1 at 7:10 p.m. Mr. Phelan seconded the motion. Roll call vote: Mr. Balzarini-yes; Mr. Cummings-yes; Mr. Phelan-yes; Mr. Callahan-yes; Chairman Waygan-yes

TOWN PLANNER REPORT

Cape Cod Coffee Update & Discussion-Mr. Lehrer reported that Cape Cod Coffee was nearing completion of construction, but that an abutter expressed concern regarding tree clearing in an area that was to remain naturally vegetated. Mr. Lehrer confirmed that tree clearing had occurred beyond the staking, and contacted Mr. Rowley to inspect whether there was a violation to the permit. Mr. Rowley inspected and provided a report, a copy of which was also given to the owner. Mr. Rowley reported that he had taken measurements, based on the location of the building, finding that the toe of the slope was located at the limit of clearing, as shown on the plan. Mr. Rowley referenced the previous plan replacing the retaining wall with a stockade fence, however, the stockade fence was now being located at the top of the slope. Board members reviewed photos provided by Mr. Rowley, who identified areas between the location of the fence and area at the edge of the brush, which should have been kept natural. The site contractor indicated that he did not cut trees, but removed underbrush to add fill. Material would be removed once the area was loamed and seeded. Mr. Rowley stated that there was technically a violation of the area shown on the site plan to remain in its natural state. Mr. Rowley had suggested the development of a plan identifying the trees, shrubs and loam and seed to be added to the site to revegetate. Mr. Balzarini inquired whether they planned to remove the dirt from around the trees and Mr. Rowley responded that the contractor agreed to remove anything around the tree. The Chair noted that their letter did not state they would remove the dirt from around the trees, but Mr. Rowley stated that the contractor told him they would do so. Mr. Phelan noted that their letter indicated that any disturbed area would be returned to its prior natural state once completed. The Chair expressed concern that the dirt required removal, and was not clearly stated.

MOTION: Mr. Balzarini made a motion to clearly send a message through the Town Engineer that the excess fill, as part of the process, be removed. Mr. Cummings seconded the motion.

Mr. Phelan stated his assumption that the letter indicated it would be returned to its natural state, meaning that the fill would be removed. Although the contractor informed Mr. Rowley, the Chair indicated that it had not been stated in writing and expressed her preference that the request be clear.

Roll call vote: Mr. Balzarini-yes; Mr. Cummings-yes; Mr. Phelan-yes; Mr. Callahan-yes; Chairman Waygan-yes

Mr. Rowley agreed to convey the information. Mr. Rowley also reported that a sidewalk had been added, although the last plan approved by the Planning Board had removed the sidewalk in a minor modification, at the request of the applicant. Mr. Rowley confirmed that the turning radius would not be impacted. In addition, binder had been added without contacting Mr. Rowley. Additional items needed to be addressed to be compliant with the site plan. Additional documentation regarding drainage was needed and Mr. Rowley anticipated another inspection to review the top coat and other minor items. The Chair inquired how the change regarding the sidewalk, returning to their original plan, would be properly documented and Mr. Rowley suggested that documentation would be in the form of tonight's acknowledgement. There was discussion regarding the necessity of a motion since the sidewalk was part of the original plan, and the consensus of the Board was that no motion was necessary

CORRESPONDENCE
-Falmouth Board of Appeals Notices
-Town of Barnstable Public Hearing Notice
-April 2020 Discharge Monitoring Report for South Cape Village-Plant met all permit effluent discharge requirements for April 2020. No influent sample was collected due to Whitewaters Safety Policy pertaining to COVID-19.
-March 2020 Discharge Monitoring Report for South Cape Village N=6.0
-February 2020 Discharge Monitoring Report for South Cape Village N=7.1
-January 2020 Discharge Monitoring Report for South Cape Village N=15.60
-December 2019 Discharge Monitoring Report for South Cape Village-no flow due to plant upgrade work
-November 2019 Discharge Monitoring Report for South Cape Village N=4.52

ADJOURNMENT
MOTION: Mr. Balzarini made a motion to adjourn. Mr. Cummings seconded the motion. All voted unanimously. Roll call vote: Mr. Balzarini-yes; Mr. Cummings-yes; Mr. Phelan-yes; Mr. Callahan-yes; Chairman Waygan-yes. The meeting adjourned at 7:32 p.m.

Respectfully submitted,

Jennifer M. Clifford
Board Secretary

LIST OF DOCUMENTS PROVIDED
Documentation available online at Mashpee's Planning Board website page

Town of Mashpee

Planning Board

16 Great Neck Road North
Mashpee, Massachusetts 02649

MEMORANDUM

TO: Andrew R. Gottlieb, Chair
Board of Selectmen

FROM: Mary E. Waygan, Chair
Planning Board

DATE: July 1, 2019

RE: Planning Board Representative to Other Boards and Committees

CC: Stephanie Coleman, Administrative Secretary
Rodney Collins, Town Manager

At the regular meeting of the Planning Board on June 19, 2019 the following appointments were made understanding the Board of Selectmen may then confirm and/or appoint:

Appointment by vote of the Planning Board:

- Dennis H. Balzarini to the Historic District Commission
- Joseph Cummings to the Environmental Oversight Committee
- John Phelan to the MMR Military Civilian Council
- Mary E. Waygan to the Community Preservation Committee

Appointment by the Chair of the Planning Board:

- Joseph Callahan to Design Review

Mr. Cummins received the attached correspondence dated June 20, 2019 stating he was appointed to Design Review. Would you kindly modify this record, or take any additional Board action you feel is necessary to modify this appointment, as Mr. Callahan was appointed to Design Review by the Planning Board Chair per Town of Mashpee Zoning Bylaw Section 174-48.C., also attached here.

Thank you!

Planning Board Representative to Other Boards and Committees

Dennis Balzarini	Historic District Commission
Joseph Cummings	Environmental Oversight Committee
John Phelan	MMR Military Civilian Council
Mary E. Waygan	Community Preservation Committee
Joseph Callahan	Design Review

Town of Mashpee — Planning Board

16 Great Neck Road North
Mashpee, Massachusetts 02649

APPLICATION FOR SPECIAL PERMIT MODIFICATION

Date received by Town Clerk: May 20, 2020 Town Clerk Signature / Seal: Deborah Dunn

The undersigned hereby applies for a Modification of the Special Permit approved by the Mashpee Planning Board on April 15, 1987 for a project entitled Willowbend.

The original Special Permit and any Modifications have been recorded in the Barnstable County Registry of Deeds at the following Book(s) and Page(s): Bk 5707, Page 291.

Name of Applicant Southworth Mashpee Property Phone 508-535-5200

Address 130 Willowbend Drive, Mashpee

Owner, if different _____ Phone _____

Address _____

Attach copies of (a) most recent recorded deed and (b) tax bill or Assessors' certification.
Deed of property recorded in Barnstable County Registry Book 26395 Page 205
or Land Court Certificate of Title No. _____

Location and description of property: North of Quinnagoreett Ave
Lot G-12A2 in Plan Book 657, Page 51

Mashpee Assessors Map(s) and Block(s): 69-117
Zoning District(s) in which property is located: R-3 (1985)

How long have you owned the property? 8 years
Section(s) of the Zoning Bylaw which require(s) the permit you seek: §9.3 and §9.4 of 1985 By-law

Present use of property: vacant / golf course

Description of proposed modification (*attach plans and documents as required by the Zoning By-law and Special Permit Regulations*):
See attached cover letter

Signature of Owner or Authorized Representative _____
Attorney for owner/applicant

Attach written authorization signed by owner.

JACK McELHINNEY
Attorney at Law

63 Shore Road, Suite 23
Winchester, MA 01890
jmcelhin@aol.com

Phone: 781.729.7299
Fax: 781.721.3419
Cell: 617.816.4092

MAY 22 2020

May 19, 2020

By Hand Delivery

Planning Board
Town of Mashpee
16 Great Neck Road North
Mashpee, MA 02649

Attn: Evan Lehrer, Town Planner

Re: Willowbend Country Club – Request for Modification No. 35 of Special Permit

Dear Members of the Planning Board:

Enclosed please find the application of Southworth Mashpee Properties LLC for a modification of the Special Permit for Willowbend Country Club. A check in the amounts of $880.00 is included to cover application fees. The application seeks approval to construct an additional six units in a three-story building on a one-acre parcel located north of Quinnaquisett Ave and south of the existing golf shop. The building will be identical to the existing three-story villa buildings on Simons Road. As with those buildings, the applicant will also need to seek a height variance from the Zoning Board of Appeals for the new three-story building. With these changes the total unit count for the Willowbend project will be increased from 273 to 279 units, which is within the 287 units currently authorized under the Special Permit. All units will be connected to and served by the existing privately owned wastewater treatment plant which serves the entire Willowbend project.

Please feel free to contact me should you have any questions.

Sincerely yours,

Jack McElhinney, Attorney for
Southworth Mashpee Properties LLC

cc: Town Clerk
Board of Health
Matthew Eddy, P.E.

Town of Mashpee
16 Great Neck Road North
Mashpee, Massachusetts 02649

Mashpee Planning Board
Public Hearing Notice

Please be advised, if the Mashpee Town Hall is still closed to the public due to the COVID-19 public health emergency the public may participate in the following manner:

Virtual / Remote Meeting
Broadcast Live on Local Cable Channel 18
Call in Conference Number: (508) 539-1400 extension 8585
***Streamed Live on the Town of Mashpee Website:**
https://www.mashpeema.gov/channel-18*****

Pursuant to Massachusetts General Laws, Chapter 40A Section 11, the Mashpee Planning Board will hold a public hearing on Wednesday, July 1, 2020 at 7:10PM at the Mashpee Town Hall, 16 Great Neck Road North, to consider an application from Southworth Mashpee Properties LLC, property owner, to modify the Willowbend Country Club Special Permit. The applicant proposes to construct a 6-unit multifamily residential townhouse structure to be known as the Clubhouse Villas on a 40,009 square foot parcel located north of Quinaquisset Avenue and found on Assessors Map 69 Block 117. With these changes the total unit count for the Willowbend project would be increased to 279, which is within the 287 units currently authorized under the Special Permit. All units will be connected to and served by the existing privately owned wastewater treatment plant which serves the entire Willowbend project.

Submitted by:

Mary E. Waygan
Mashpee Planning Board

Publication dates: Friday, June 12, 2020
Friday, June 19, 2020

Town of Mashpee
16 Great Neck Road North
Mashpee, Massachusetts 02649

Applicant:
Southworth Mashpee Properties LLC

Property Owner:
Southworth Mashpee Properties LLC

Subject Property:
Vacant parcel north of Quinaquisset Avenue Identified on plan recorded in Barnstable County Registry of Deeds Plan Book 657 Page 51 as Lot G-12A2 and on Mashpee Assessor's Map 69 Block 117

June 4, 2020

Dear Mashpee Property Owner,

As the registered owner of a property located within 300' of the subject property named above, you are being notified that the Mashpee Planning Board is holding a public hearing on **Wednesday, July 1, 2020 at 7:10 PM in the Waquoit Meeting Room, Mashpee Town Hall, 1st Floor, 16 Great Neck Road North, Mashpee, MA 02649** to solicit comments regarding the following case:

> *Southworth Mashpee Properties LLC has filed an application to modify the Willowbend Country Club Special Permit. The applicant proposes to construct a 6-unit multifamily residential townhouse structure to be known as the Clubhouse Villas on a 40,009 square foot parcel located north of Quinaquisset Avenue and found on Assessors Map 69 Block 117. With these changes the total unit count for the Willowbend project would be increased to 279, which is within the 287 units currently authorized under the Special Permit. All units will be connected to and served by the existing privately owned wastewater treatment plant which serves the entire Willowbend project.*

Please be advised that the Mashpee Town Hall is still closed to the public due to the COVID-19 public health emergency and as such this meeting will be conducted virtually/remotely. The public may participate in the following manner:

- **Broadcast Live on Local Cable Channel 18**
- **Call in Conference Number: (508) 539-1400 extension 8585**
- **Streamed Live on the Town of Mashpee Website:** https://www.mashpeema.gov/channel-18*****

If you wish to provide comment and are unable to call in to the conference line please submit comments to me in writing via the contact information provided below or by emailing the Planning Board at PlanningBoard@mashpeema.gov. Your comments will be entered into the public record for the Board's consideration.

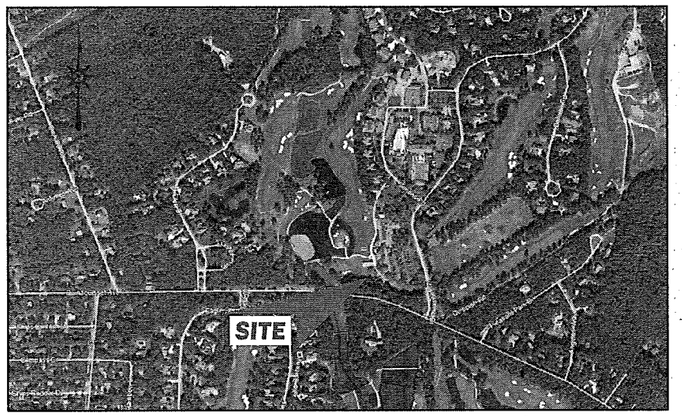
Please do not hesitate to contact me by phone, email, or in person should you have questions about why you are receiving this notification.

Sincerely,

Evan R. Lehrer, Town Planner
16 Great Neck Road North
Mashpee, MA 02649
elehrer@mashpeema.gov
(508) 539-1400 x. 8521

Clubhouse Villas At Willowbend
Site Construction Plans

Mashpee, Massachusetts



Locus Map Scale 1" = 500'

Owner :

Southworth Cape Development, LLC
130 Willowbend Drive
Mashpee, MA 02649
(508)-539-5316

Applicant :

Southworth Mashpee Properties, LLC
130 Willowbend Drive
Mashpee, MA 02649 Phone
(508)-539-5316

Engineer/Surveyor :

BAXTER NYE ENGINEERING & SURVEYING
Registered Professional Engineers and Land Surveyors
78 North Street - 3rd Floor
Hyannis, MA 02601 Phone
(508) 771-7502 Fax - (508) 771-7622
ATTN : Matthew Eddy, P.E.

Job Number: 2014-009

PLAN SHEET INDEX

No.		DRAWING TITLE
C	0.0	Cover Sheet
C	1.0	Legend and General Notes
C	2.0	Existing Conditions Plan
C	3.0	Layout and Dimension Plan
C	3.1	Tower Truck Turning Template Plan
C	3.2	Fire Engine Turning Template Plan
C	4.0	Grading and Drainage Plan
C	4.1	Stormwater Management Details and Notes
C	5.0	Utility Plan and Notes
C	6.0	Detail Sheet
C	6.1	Detail Sheet

FOR PERMIT ONLY - NOT FOR CONSTRUCTION

BAXTER NYE
ENGINEERING & SURVEYING

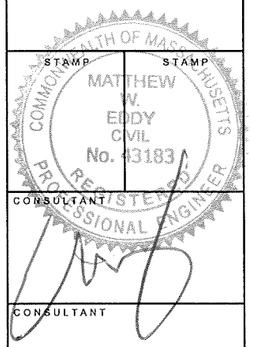
BAXTER NYE ENGINEERING & SURVEYING

Registered Professional Engineers and Land Surveyors

78 North Street – 3rd Floor
Hyannis, Massachusetts 02601

Phone – (508) 771-7502
Fax – (508) 771-7622
www.baxter-nye.com

STAMP



STAMP

CONSULTANT

CONSULTANT

PREPARED FOR:
SOUTHWORTH MASHPEE PROPERTIES, LLC
130 Willowbend Drive
Mashpee MA 02549

PROJECT TITLE
Willowbend Country Club
Clubhouse Villas

	DATE	DESCRIPTION

SHEET TITLE
Cover Sheet

SHEET NO
C0.0

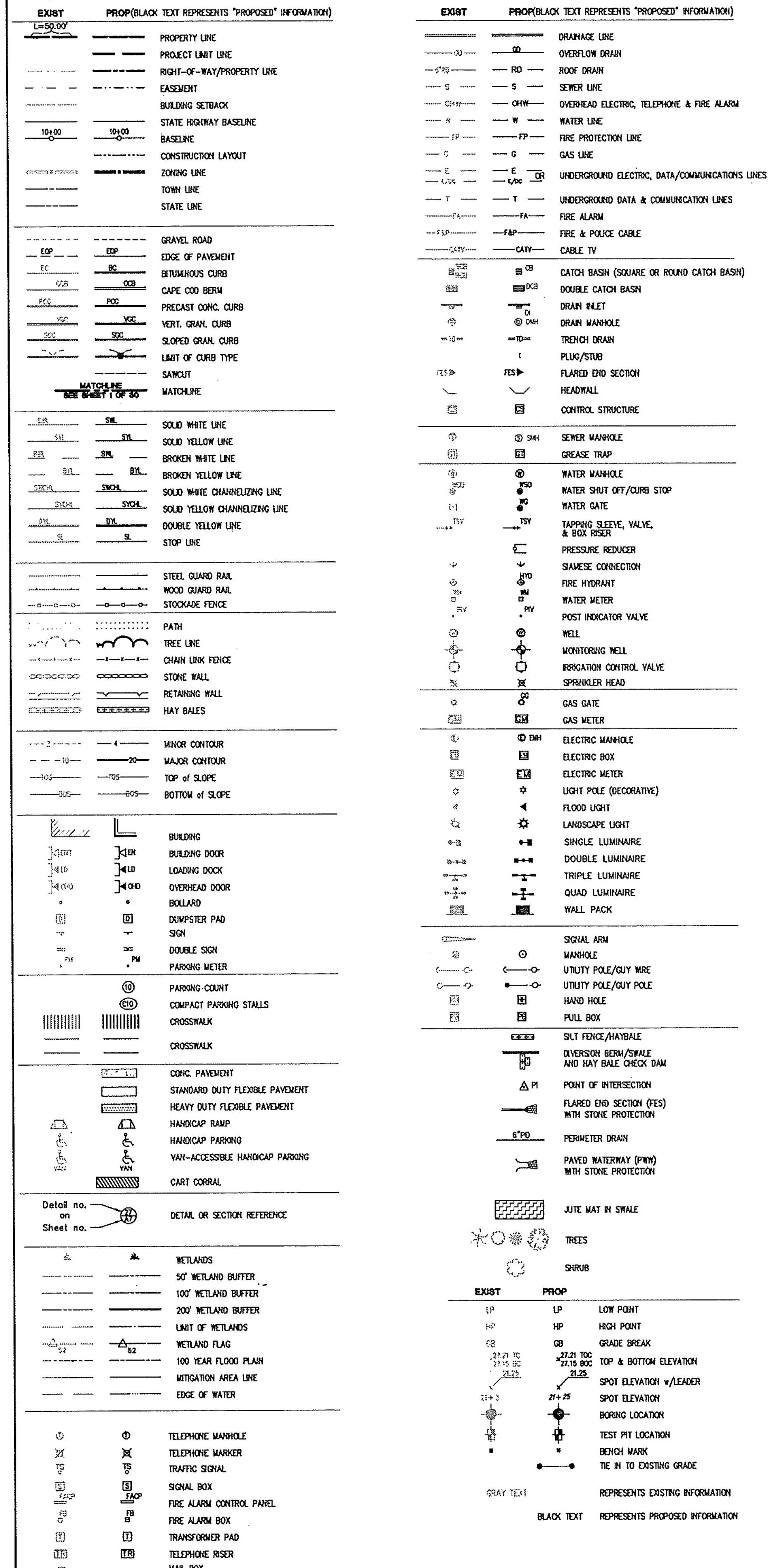
DATE: APRIL 14, 2020

SCALE: NTS

DRAWN BY: SDM CHECKED BY: MWE

JOB NO: 2014-009 FILE: 2014-009-CLUB RMS CV.dwg

LEGEND


EXIST
PROP(BLACK TEXT REPRESENTS "PROPOSED" INFORMATION)
PROPERTY LINE
PROJECT LIMIT LINE
RIGHT-OF-WAY/PROPERTY LINE
EASEMENT
BUILDING SETBACK
STATE HIGHWAY BASELINE
BASELINE
CONSTRUCTION LAYOUT
ZONING LINE
TOWN LINE
STATE LINE
GRAVEL ROAD
EDGE OF PAVEMENT
BITUMINOUS CURB
CAPE COD BERM
PRECAST CONC. CURB
VERT. GRAN. CURB
SLOPED GRAN. CURB
LIMIT OF CURB TYPE
SAWCUT
MATCHLINE
SOLID WHITE LINE
SOLID YELLOW LINE
BROKEN WHITE LINE
BROKEN YELLOW LINE
SOLID WHITE CHANNELIZING LINE
SOLID YELLOW CHANNELIZING LINE
DOUBLE YELLOW LINE
STOP LINE
STEEL GUARD RAIL
WOOD GUARD RAIL
STOCKADE FENCE
PATH
TREE LINE
CHAIN LINK FENCE
STONE WALL
RETAINING WALL
HAY BALES
MINOR CONTOUR
MAJOR CONTOUR
TOP of SLOPE
BOTTOM of SLOPE
BUILDING
BUILDING DOOR
LOADING DOCK
OVERHEAD DOOR
BOLLARD
DUMPSTER PAD
SIGN
DOUBLE SIGN
PARKING METER
PARKING COUNT
COMPACT PARKING STALLS
CROSSWALK
CROSSWALK
CONC. PAVEMENT
STANDARD DUTY FLEXIBLE PAVEMENT
HEAVY DUTY FLEXIBLE PAVEMENT
HANDICAP RAMP
HANDICAP PARKING
VAN-ACCESSIBLE HANDICAP PARKING
CART CORRAL
Detail no. on Sheet no.
DETAIL OR SECTION REFERENCE
WETLANDS
50' WETLAND BUFFER
100' WETLAND BUFFER
200' WETLAND BUFFER
LIMIT OF WETLANDS
WETLAND FLAG
100 YEAR FLOOD PLAIN
MITIGATION AREA LINE
EDGE OF WATER
TELEPHONE MANHOLE
TELEPHONE MARKER
TRAFFIC SIGNAL
SIGNAL BOX
FIRE ALARM CONTROL PANEL
FIRE ALARM BOX
TRANSFORMER PAD
TELEPHONE RISER
MAIL BOX
EXIST
PROP(BLACK TEXT REPRESENTS "PROPOSED" INFORMATION)
DRAINAGE LINE
OVERFLOW DRAIN
ROOF DRAIN
SEWER LINE
OVERHEAD ELECTRIC, TELEPHONE & FIRE ALARM
WATER LINE
FIRE PROTECTION LINE
GAS LINE
UNDERGROUND ELECTRIC, DATA/COMMUNICATIONS LINES
UNDERGROUND DATA & COMMUNICATION LINES
FIRE ALARM
FIRE & POLICE CABLE
CABLE TV
CATCH BASIN (SQUARE OR ROUND CATCH BASIN)
DOUBLE CATCH BASIN
DRAIN INLET
DRAIN MANHOLE
TRENCH DRAIN
PLUG/STUB
FLARED END SECTION
HEADWALL
CONTROL STRUCTURE
SEWER MANHOLE
GREASE TRAP
WATER MANHOLE
WATER SHUT OFF/CURB STOP
WATER GATE
TAPPING SLEEVE, VALVE, & BOX RISER
PRESSURE REDUCER
SIAMESE CONNECTION
FIRE HYDRANT
WATER METER
POST INDICATOR VALVE
WELL
MONITORING WELL
IRRIGATION CONTROL VALVE
SPRINKLER HEAD
GAS GATE
GAS METER
ELECTRIC MANHOLE
ELECTRIC BOX
ELECTRIC METER
LIGHT POLE (DECORATIVE)
FLOOD LIGHT
LANDSCAPE LIGHT
SINGLE LUMINAIRE
DOUBLE LUMINAIRE
TRIPLE LUMINAIRE
QUAD LUMINAIRE
WALL PACK
SIGNAL ARM
MANHOLE
UTILITY POLE/GUY WIRE
UTILITY POLE/GUY POLE
HAND HOLE
PULL BOX
SILT FENCE/HAYBALE
DIVERSION BERM/SWALE AND HAY BALE CHECK DAM
POINT OF INTERSECTION
FLARED END SECTION (FES) WITH STONE PROTECTION
PERIMETER DRAIN
PAVED WATERWAY (PWW) WITH STONE PROTECTION
JUTE MAT IN SWALE
TREES
SHRUB
EXIST
PROP
LOW POINT
HIGH POINT
GRADE BREAK
TOP & BOTTOM ELEVATION
SPOT ELEVATION w/LEADER
SPOT ELEVATION
BORING LOCATION
TEST PIT LOCATION
BENCH MARK
TIE IN TO EXISTING GRADE
GRAY TEXT REPRESENTS EXISTING INFORMATION
BLACK TEXT REPRESENTS PROPOSED INFORMATION

ABBREVIATIONS

GENERAL

ABAN	ABANDON
ADJ	ADJUST
APPROX	APPROXIMATE
BB	BITUMINOUS BERM
BC	BITUMINOUS CURB
BOC	BOTTOM OF CURB
BOS	BOTTOM OF SLOPE
BOW	BOTTOM OF WALL
CC	CONCRETE CURB
CCB	CAPE COD BERM
CSE	COBBLESTONE EDGING
ECB	EROSION CONTROL BLANKET
ELEV	ELEVATION
EXIST	EXISTING
EQ.	EQUAL
FDN	FOUNDATION
FF	FINISHED FLOOR ELEVATION
GB	GRADE BREAK
GC	GRANITE CURB
GE	GRANITE EDGING
HC	HANDICAP
HP	HIGH POINT
LA	LANDSCAPE AREA
LP	LOW POINT
MAX	MAXIMUM
MIN	MINIMUM
MCC	MONOLITHIC CONCRETE CURB
MHB/EP LP	MASS HIGHWAY BOUND/ ESCUTCHEON PIN LEAD PLUG
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
PCC	PRECAST CONCRETE CURB
PROP	PROPOSED
PWW	PAVED WATER WAY
REMOD	REMODEL
REM	REMOVE
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RET	RETAIN
SGE	SLOPED GRANITE EDGING
SGC	SLOPED GRANITE CURB
TIEG	TIE INTO EXISTING GRADE
TOC	TOP OF CURB
TOF	TOP OF FOUNDATION
TOS	TOP OF SLOPE
TOW	TOP OF WALL
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
VIF	VERIFY IN FIELD BY CONTRACTOR
VGC	VERTICAL GRANITE CURB

UTILITY

ACCMP	ASPHALT COATED CORRUGATED METAL PIPE
CAP	CORRUGATED ALUMINUM PIPE
CIP	CAST IRON PIPE
CIT	CHANGE IN TYPE
CMP	CORRUGATED METAL PIPE
COND	CONDUIT
CPP	HIGH DENSITY POLYETHYLENE CORRUGATED PLASTIC PIPE - SMOOTH INTERIOR
CS	CURB STOP FOR WATER LINE
DIP	DUCTILE IRON PIPE
DS	DOWN SPOUT
E	ELECTRIC
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
G	GAS
HYD	HYDRANT
ID	INTERCEPTOR DRAIN
INV	INVERT ELEVATION
PD	PERFORATED DRAIN
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
S	SEWER
C/O	SEWER CLEANOUT
SD	STORM DRAIN
T	TELEPHONE
TSV&B	TAPPING SLEEVE, VALVE & & BOX RISER
UP	UTILITY POLE
VIF	VERIFY IN FIELD
VCP	VITRIFIED CLAY PIPE
W	WATER

GENERAL CONSTRUCTION NOTES

* (ALL REFERENCES TO "CONTRACTOR" SHALL MEAN THE GENERAL CONTRACTOR OR HIS SUB-CONTRACTORS.)

1. ALL WORK & MATERIALS SHALL BE IN ACCORDANCE WITH MASSDOT, HIGHWAY DIVISION, STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES (MASSDOT-SSHB), AS CURRENTLY AMENDED, UNLESS OTHERWISE NOTED. IF THERE ARE CONFLICTS IN ANY OF THE SPECIFICATIONS OR PROJECT DOCUMENTS, THE HIGHER STANDARD SHALL APPLY.

ALL WORK UNDER THESE DOCUMENTS SHALL ALSO CONFORM TO ALL CODES AND STANDARDS, AS CURRENTLY AMENDED, WHICH ARE APPLICABLE TO THIS PROJECT. ALL WORK SHALL FURTHER CONFORM TO SPECIFIC REQUIREMENTS, SPECIFICATIONS, ORDINANCES AND INTERPRETATIONS OF LOCAL AUTHORITIES HAVING JURISDICTION OVER THE PROJECT. DETERMINATION OF APPLICABLE CODES AND STANDARDS AND OF THE AUTHORITIES HAVING JURISDICTION, SHALL BE THE RESPONSIBILITY OF EACH CONTRACTOR, AS SHALL BE THE ANALYSIS OF ALL SUCH CODES AND STANDARDS IN REGARD TO THEIR APPLICABILITY TO THE PROJECT FOR SECURING ALL APPROVALS AND PERMITS.

ALL WORK WITHIN THESE PLANS SHALL BE PERFORMED AND PROVIDED BY THE CONTRACTOR IN ACCORDANCE WITH THE CONSTRUCTION DETAILS PROVIDED IN THIS PLAN SET WHETHER OR NOT THE DETAIL NUMBER IS SPECIFICALLY REFERENCED.

EXCEPT WHERE THE PROJECT DOCUMENTS INCLUDE MORE STRINGENT REQUIREMENTS, APPLICABLE CONSTRUCTION INDUSTRY STANDARDS HAVE THE SAME FORCE AND EFFECT AS IF BOUND HERETO. SUCH STANDARDS ARE MADE A PART OF THE PROJECT DOCUMENTS BY REFERENCE.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL QUANTITY ESTIMATES AND VERIFYING, TO HIS OWN SATISFACTION, THAT ALL QUANTITIES ARE ACCURATE FOR ALL CONSTRUCTION MATERIALS, INCLUDING CUT & FILL ESTIMATES WHICH THE CONTRACTOR MAY PREPARE BASED ON INFORMATION CONTAINED WITHIN THESE PLANS.

3. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.

4. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS WITH THE APPROPRIATE UTILITY COMPANIES FOR OBTAINING CONSTRUCTION PERMITS AND PERFORMING ALL NEW CONSTRUCTION, RELOCATION, ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC (INCLUDING UTILITY POLES), TELEPHONE, CABLE, FIRE ALARM, WATER, SANITARY SEWER, STORM DRAIN, AND ANY OTHER UTILITIES, BOTH PUBLIC AND PRIVATE, AS REQUIRED.

5. THE LOCATION OF EXISTING UNDERGROUND SYSTEMS, INFRASTRUCTURE, UTILITIES, CONDUITS, WELLS, AND LINES ARE SHOWN IN AN APPROXIMATE WAY ONLY, MAY NOT BE LIMITED TO THOSE SHOWN HEREIN, AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER, THE ENGINEER, OR THEIR REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION, BOTH HORIZONTALLY AND VERTICALLY, OF ALL EXISTING UTILITIES, CONDUITS, LINES, WELLS, AND OTHER BURIED INFRASTRUCTURE AND SYSTEMS BEFORE THE START OF ANY WORK. THE CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO LOCATE THE INFRASTRUCTURE, UTILITIES, CONDUITS AND LINES EXACTLY. THE CONTRACTOR SHALL PRESERVE ALL UNDERGROUND INFRASTRUCTURE AND UTILITIES AS REQUIRED. THE CONTRACTOR MUST CALL "DIG SAFE" (AT 1-888-DIG-SAFE) AT LEAST 72 HOURS BEFORE THE START OF CONSTRUCTION.

6. THE CONTRACTOR SHALL BE RESPONSIBLE TO CALL AT LEAST 24 HOURS AHEAD FOR INSPECTIONS BY THE APPROPRIATE AUTHORITY IN ACCORDANCE WITH THE TOWN REQUIREMENTS, AS APPLICABLE.

7. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES, PUBLIC AND PRIVATE, INCLUDING THOSE IN CONTROL OF UTILITIES NOT SHOWN ON THIS PLAN, (SEE CHAPTER 370, ACTS OF 1963, MASSACHUSETTS) PRIOR TO COMMENCING ANY WORK.

8. BAXTER NYE ENGINEERING & SURVEYING ASSUMES NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN.

9. THE TERM "PROPOSED" (PROP.) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R).

10. UPON AWARD OF CONTRACT, CONTRACTOR SHALL MAKE ALL NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN ALL NECESSARY PERMITS, PAY ALL FEES AND POST ALL BONDS ASSOCIATED WITH SAME, AND COORDINATE WITH THE ENGINEER AS REQUIRED.

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS DO NOT CONFLICT WITH ANY KNOWN EXISTING INFORMATION OR OTHER PROPOSED IMPROVEMENTS. IF ANY CONFLICTS ARE DISCOVERED, THE CONTRACTOR MUST NOTIFY THE OWNER OR ENGINEER IMMEDIATELY UPON DISCOVERY AND AT LEAST 72 HOURS PRIOR TO INSTALLATION OF ANY PORTION OF THE AFFECTED WORK.

12. THE CONTRACTOR SHALL REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR ALL BUILDING DIMENSIONS AND CONSTRUCTION. BUILDING DIMENSIONS SHOWN HEREIN ARE FOR COORDINATION WITH OTHER SITE WORK ONLY AND SHOULD NOT BE USED TO STAKE OUT BUILDINGS. SITE CONTRACTOR SHALL STAKE OUT THE EXTERIOR BUILDING CORNERS FROM THE LATEST ARCHITECTURAL PLANS. THE CONTRACTOR SHALL NOTIFY BAXTER NYE ENGINEERING & SURVEYING OF ANY DISCREPANCIES BETWEEN SITE PLAN DIMENSIONS AND ARCHITECTURAL BUILDING PLANS BEFORE PROCEEDING WITH ANY PORTION OF SITE WORK WHICH MAY BE EFFECTED SO THAT PROPER ADJUSTMENTS TO THE SITE LAYOUT CAN BE MADE IF NECESSARY.

13. PRIOR TO THE START OF CONSTRUCTION THE CONTRACTOR SHALL SUBMIT A SCHEDULE OF OPERATIONS TO THE OWNER AND ITS REPRESENTATIVE. THE CONTRACTOR SHALL NOTIFY AND COORDINATE WITH THE OWNER, ITS ENGINEER OR REPRESENTATIVE.

14. THE CONTRACTOR SHALL CONTACT THE ENGINEER TO SCHEDULE A PRE-CONSTRUCTION MEETING AT LEAST TWO (2) WEEKS PRIOR TO COMMENCING CONSTRUCTION.

15. THE CONTRACTOR SHALL MAKE SUBMITTALS TO THE ENGINEER FOR APPROVAL BEFORE ANY FABRICATION OR DELIVERY OF PRODUCTS OR MATERIALS.

16. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR JOB SITE SAFETY AND ALL CONSTRUCTION MEANS AND METHODS. BAXTER NYE ENGINEERING & SURVEYING, DOES NOT ASSUME ANY RESPONSIBILITY IN JOB SITE SAFETY FOR CONSTRUCTION METHODS USED. ALL FEDERAL, STATE, AND LOCAL OSHA REQUIREMENTS AND REGULATIONS SHALL BE FOLLOWED BY ALL PERSONNEL ON THE JOB SITE AT ALL TIMES.

17. THE CONTRACTOR SHALL REMOVE ALL STUMPS, RUBBISH, AND DEBRIS FROM THE PROJECT SITE. STORAGE OF THESE ITEMS WILL NOT BE PERMITTED ON THE PROJECT SITE. THE CONTRACTOR SHALL LEAVE THE SITE IN A SAFE, CLEAN, AND LEVEL CONDITION AT THE COMPLETION OF THE SITE CLEARANCE WORK.

18. ALL UNSUITABLE MATERIALS ENCOUNTERED WITHIN THE LIMIT OF WORK SUB GRADES SHALL BE REMOVED, AS DIRECTED BY THE ENGINEER OR OWNERS REPRESENTATIVE, TO NATURAL STABLE GROUND BY THE CONTRACTOR. UNSUITABLE MATERIALS INCLUDE TOPSOIL, LOAM, PEAT, ALL ORGANIC MATERIAL, SNOW, ICE, CONSTRUCTION RUBBLE, TRASH, AND OTHER DELETERIOUS DEBRIS.

19. TREES AND SHRUBS WITHIN THE LIMITS OF GRADING SHALL BE REMOVED AND RESET ONLY UPON APPROVAL OF THE ENGINEER OR OWNERS REPRESENTATIVE.

20. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS, WITHOUT PRIOR APPROVAL BY THE OWNER OR ITS REPRESENTATIVE, SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.

21. EXISTING SUBSURFACE ROCK IS NOT SHOWN ON THE PLANS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE THEIR OWN DETERMINATION AS TO THE LOCATION OF SUBSURFACE ROCK.

22. THE CONTRACTOR SHALL PROTECT ALL UNDERGROUND DRAINAGE, SEWER, AND UTILITY FACILITIES FROM EXCESSIVE VEHICULAR LOADS DURING CONSTRUCTION. ANY FACILITIES DAMAGED BY CONSTRUCTION LOADS SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

23. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS NOTED OTHERWISE.

24. JOINTS BETWEEN NEW BITUMINOUS CONCRETE ROADWAY PAVEMENT AND SAWCUT EXISTING PAVEMENT SHALL BE SEALED WITH BITUMEN AND BACKSANDED. ALL JOINTS TO EXISTING PAVEMENT SHALL BE SAWCUT TRUE AND STRAIGHT. ALL CRACKED OR INADEQUATE PAVEMENT AND/OR SUBBASE MATERIAL SHALL BE REMOVED AND REPLACED.

25. ALL PROPOSED WALKWAYS WILL BE HANDICAPPED ACCESSIBLE. ALL PROPOSED SLOPES ON WALKWAYS SHALL BE LESS THAN 5% AND ALL CROSS SLOPES <2%. THESE ARE MAXIMUM SLOPES WITH NO TOLERANCE. ALL WORK WILL BE IN ACCORDANCE WITH THE MOST CURRENT REQUIREMENTS OF THE U.S. ACCESS BOARD, AMERICANS WITH DISABILITIES ACT & COMMONWEALTH OF MASSACHUSETTS, ARCHITECTURAL ACCESS BOARD.

26. FINAL LAYOUT AND STAKING OF ALL PROPOSED FEATURES AND GRADING SHALL BE REVIEWED IN THE FIELD AND APPROVED BY THE OWNERS REPRESENTATIVE PRIOR TO ANY SITE PREPARATION OR CONSTRUCTION. THE CONTRACTOR SHALL NOT ADJUST OR MODIFY THE LAYOUT AND STAKING OF ANY PROPOSED FEATURES WITHOUT FINAL APPROVAL FROM THE OWNERS REPRESENTATIVE AND ANY GOVERNMENTAL AGENCY WHICH MAY HAVE JURISDICTION OVER CONTEMPLATED CHANGE.

27. ALL ELECTRICAL (BOTH PRIMARY AND SECONDARY), TELEPHONE, DATA/COM AND FIRE DEPARTMENT CONDUITS AND APPURTENANT FEATURES REQUIRED BY THE APPLICABLE UTILITY COMPANY ARE TO BE INSTALLED BY THE ELECTRICAL CONTRACTOR. TRENCHING, BACKFILLING, CONCRETE WORK, MANHOLE AND RELATED STRUCTURES AND STREET REPAIR SHALL BE PERFORMED BY THE GENERAL CONTRACTOR/SITE CONTRACTOR. ALL ASSOCIATED COSTS FOR COMPLETE EXECUTION OF THIS WORK SHALL BE INCLUDED IN THE CONTRACTORS PRICING.

28. RIM ELEVATIONS OF DRAINAGE AND SANITARY SEWER MANHOLES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH AND CONSISTENT WITH GRADING PLANS. ADJUST ALL OTHER RIM ELEVATIONS OF MANHOLES, GAS GATES, WATER GATES AND OTHER UTILITIES TO FINISHED GRADE WITHIN THE LIMITS OF THE SITE WORK.

29. ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE REPLACED IN KIND. SURFACES NOT OTHERWISE TREATED SHALL BE STABILIZED AS LAWNS. ALL LAWN AREAS SHALL HAVE A MODIFIED LOAM BORROW PLACED, SEEDED, FERTILIZED, LIMED AND MULCHED UNTIL GRASS STAND IS ESTABLISHED AND SURFACE IS STABILIZED. THE MODIFIED LOAM BORROW SHALL HAVE A MINIMUM DEPTH OF 6" AND SHALL BE PLACED FLUSH WITH THE TOP OF ADJACENT CURB, EDGING, BERM, OR OTHER SURFACE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AREAS UNTIL VEGETATION HAS BEEN PERMANENTLY ESTABLISHED. SLOPES IN EXCESS OF 3:1 SHALL BE FURTHER STABILIZED WITH EROSION CONTROL BLANKETS (ECB) OF CURLEX OR EQUAL.

30. THE CONTRACTOR SHALL WATER, MOW, FERTILIZE OR OTHERWISE MAINTAIN ALL SODDED AND SEEDED OR OTHERWISE STABILIZED AREAS UNTIL GRASS STANDS OR OTHER VEGETATED METHODS ARE ESTABLISHED TO THE SATISFACTION OF THE OWNER OR THEIR REPRESENTATIVE.

31. THE CONTRACTOR SHALL RESET ALL MONUMENTATION DISTURBED DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL PROVIDE A SURVEY BY A PLS TO ENSURE THAT THE MONUMENTATION IS RESET TO ITS ORIGINAL LOCATION, MONUMENTS INCLUDE, BUT ARE NOT LIMITED TO, TOWN BOUNDS, MASS HIGHWAY BOUNDS, PROPERTY LINE MONUMENTS, IRON RODS, STAKES, CONCRETE BOUNDS, GRANITE BOUNDS AND STONE WALLS WITH DRILL HOLES.

EXCAVATION SAFETY:

ALL EXCAVATION MUST FOLLOW OSHA, MASSACHUSETTS AND LOCAL REGULATIONS FOR SAFETY. ALL TRENCH EXCAVATION EXCEEDING 3 FEET OF DEPTH WILL REQUIRE A TRENCH PERMIT FROM THE LOCAL TOWN OR CITY PRIOR TO ANY EXCAVATION.

DRAWINGS STATEMENT:

THE CONTRACTOR WILL PREPARE AS-BUILT DRAWINGS, STAMPED BY A MA LICENSED PROFESSIONAL ENGINEER (PE) CERTIFYING THAT: "TO THE BEST OF THEIR KNOWLEDGE, JUDGEMENT AND BELIEF, THE CONSTRUCTED WORK IS IN GENERAL CONFORMANCE WITH THE PLANS."

INSPECTIONS:

1. CONTRACTOR SHALL COORDINATE WITH THE ENGINEER ON ALL NECESSARY INSPECTIONS AT THE PRE-CONSTRUCTION MEETING. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 48 HOURS (2 BUSINESS DAYS) AHEAD OF A REQUIRED INSPECTIONS.

2. AT A MINIMUM, THE FOLLOWING INSPECTIONS WILL BE REQUIRED:
   A. INSTALLATION OF SEDIMENT AND EROSION CONTROLS AT LIMIT OF WORK PRIOR TO COMMENCING CONSTRUCTION.
   B. BOTTOM OF EXCAVATION FOR EACH STORMWATER MANAGEMENT (SWM) FACILITY.
   C. FINAL STABILIZATION AND PLANTINGS PRIOR TO REMOVING ANY SEDIMENT AND EROSION CONTROL DEVICES.
   D. BN WILL NEED TO WITNESS A REPRESENTATIVE UTILITY INSTALLATION BEFORE BACKFILL FOR:
      - WATER
        CONTRACTOR TO PROVIDE BN WITH WATER DEPT. APPROVED INSPECTION REPORT
      - SEWER
        CONTRACTOR TO PROVIDE BN WITH SEWER DEPT. APPROVED INSPECTION REPORT
   E. GRAVEL BORROW SUBBASE UNDER ALL PAVED AND CONCRETE SURFACES (UNLESS OTHERWISE WITNESSED BY A TESTING AGENCY.)
   F. BN WILL NEED TO WITNESS REPRESENTATIVE INSTALLATION OF VERTICAL CURBING.
   G. BN SHALL BE PROVIDED FOR REVIEW ALL TESTING AGENCY LABORATORY MATERIAL AND ON-SITE TESTING RESULTS AS REQUIRED UNDER THE PROJECT DOCUMENTS FOR COMPLETE REQUIREMENTS, INCLUDING BUT NOT LIMITED TO:
      - SANDY TOPSOIL SIEVE ANALYSIS AND MATERIAL CHARACTERISTICS PER SPEC
      - ALL COMPACTION TESTING RESULTS FOR BACKFILL.
      - GRAVEL BORROW MATERIAL UNDER PAVING, SIDEWALK, SITE SLABS, PADS, ETC. AS TO DEPTH OF MATERIAL PLACEMENT AND COMPACTION TESTING RESULTS.
      - BITUMINOUS CONCRETE PLACEMENT AND COMPACTION TESTING RESULTS.
   THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING MATERIAL SAMPLES TO AND COORDINATING WITH THE TESTING AGENCY AS REQUIRED.

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PREPARED FOR:
SOUTHWORTH MASHPEE PROPERTIES, LLC
130 Willowbend Drive
Mashpee MA 02549

PROJECT TITLE
Willowbend Country Club Clubhouse Villas

DATE	DESCRIPTION

SHEET TITLE
Legend and General Notes

SHEET NO
C1.0

DATE: APRIL 14, 2020

SCALE: NTS

DRAWN BY: SDW
CHECKED BY: MWE
JOB NO: 2014-009
FILE: 2014-009-CLUB LG.dwg

GENERAL NOTES:

1. THE INTENT OF THIS PLAN IS TO DETAIL EXISTING SITE CONDITIONS AT AT WILLOWBEND DRIVE.

2. PER CURRENT ASSESSOR'S RECORDS:

   WILLOWBEND DRIVE
   OWNER: SOUTHWORTH CAPE DEVELOPMENT, LLC
   DEED BOOK XXXXX
   CERTIFICATE OF TITLE:
   RECORD PLAN: PLAN BOOK XXX PAGE XXX
   ASSESSOR'S PARCEL 69-XX

3. ZONING INFORMATION:

   ** WILLOWBEND IS UNDER AN EXISTING SPECIAL PERMIT WHICH SUPERCEDES CURRENT ZONING REQUIREMENTS REFER TO EXISTING SPECIAL PERMIT DOCUMENTATION FOR THE SUBJECT PROPERTY.

   ZONING DISTRICT : R3
   CURRENT MINIMUM ZONING REQUIREMENTS:
   MIN. LOT AREA = 10,000 SF
   MIN. LOT FRONTAGE = 50'
   MIN. LOT WIDTH = N/A
   SETBACKS: FRONT YARD = 20'
   SIDE & REAR YARD* = 10'* / 10'*
   FRONT YARD LANDSCAPED 10'

   * THE SPGA MAY REDUCE TO ZERO THE REAR AND SIDE SETBACKS FOR BUILDINGS TO ACCOMMODATE SHARED ACCESS DRIVEWAYS OR PARKING THAT SERVICE BUILDINGS LOCATED ON TWO OR MORE ADJOINING LOTS.

   OVERLAY DISTRICTS: NONE

4. A TITLE SEARCH HAS NOT BEEN PERFORMED FOR THIS SITE. THERE MAY BE RIGHTS BY OTHERS, EASEMENT, TAKINGS, MORTGAGES, RIGHT OF WAYS ETC. NOT DEPICTED. IF DETERMINED TO BE NECESSARY, A TITLE SEARCH SHALL BE PERFORMED BY OTHERS AND SUPPLIED TO BAXTER NYE ENGINEERING & SURVEYING.

5. THE PROPERTY LINE INFORMATION SHOWN IS BASED ON CURRENT AVAILABLE RECORD INFORMATION CONSISTING OF PLANS AND DEEDS. THE EXISTING FEATURES WITHIN THE LIMITS OF SURVEY SHOWN HEREON WERE OBTAINED FROM AN ON THE GROUND FIELD SURVEY PERFORMED BY BAXTER NYE ENGINEERING & SURVEYING ON OCTOBER 8 AND 15, 2019.

6. BY GRAPHIC PLOTTING ONLY, THE PARCEL SHOWN HEREON LIES WITHIN FLOOD ZONE X OTHER AREAS ON THE FEMA FLOOD INSURANCE RATE MAP (F.I.R.M.) COMMUNITY PANEL NUMBER 250009 0572 J.

7. ENVIRONMENTAL INFORMATION:
   PER MASS GIS OLIVER AS OF 02/27/2020:

   - SITE DOES NOT APPEAR TO BE WITHIN AN A.C.E.C. (AREA OF CRITICAL ENVIRONMENTAL CONCERN).
   - SITE DOES NOT APPEAR TO BE WITHIN AN AREA OF ESTIMATED HABITAT OF RARE WILDLIFE AS MAPPED ON MASS GIS OLIVER PER NHESP "ESTIMATED HABITATS OF RARE WILDLIFE" FOR USE WITH THE MA WETLANDS PROTECTION ACT REGULATIONS (310 CMR 10)."
   - SITE DOES NOT APPEAR TO BE WITHIN A PRIORITY HABITAT AS MAPPED ON MASS GIS OLIVER PER NHESP "PRIORITY HABITATS OF RARE SPECIES" FOR SPECIES UNDER THE MASSACHUSETTS ENDANGERED SPECIES ACT, REGULATIONS (321 CMR 10).
   - SITE DOES NOT APPEAR TO CONTAIN A CERTIFIED VERNAL POOL AS MAPPED ON MASS GIS OLIVER PER NHESP "CERTIFIED VERNAL POOLS."
   - THE WETLAND RESOURCE AREA SHOWN HEREON ARE BASED UPON A FIELD DELINEATION AND LOCATION BY BAXTER NYE ENGINEERING ON 10/15/2019.
   - SITE DOES NOT APPEAR TO BE WITHIN A STATE APPROVED ZONE II GROUNDWATER RECHARGE PROTECTION AREA.

8. UTILITY INFORMATION SHOWN HEREIN:

   - THE CONTRACTOR SHALL CONTACT DIG SAFE (AT 1-888-DIG-SAFE) AND UTILITY COMPANIES TO LOCATE THE LOCATION OF ALL EXISTING UTILITIES, AT LEAST 72 HOURS PRIOR TO THE START OF CONSTRUCTION. EXISTING UNDERGROUND INFRASTRUCTURE, UTILITIES, CONDUITS AND LINES ARE SHOWN IN AN APPROXIMATE WAY ONLY, MAY NOT BE LIMITED TO THOSE SHOWN HEREIN AND HAVE BEEN RESEARCHED BASED ON THE AVAILABLE UTILITY RECORDS NOTED HEREON. THE CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO LOCATE SAID INFRASTRUCTURE AND UTILITIES EXACTLY. IF FIELD CONDITIONS DIFFER FROM PLAN INFORMATION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY FOR POSSIBLE REDESIGN.
   - SOURCE INFORMATION FROM PLANS HAS BEEN COMBINED WITH OBSERVED EVIDENCE OF UTILITIES TO DEVELOP A VIEW OF THOSE UNDERGROUND UTILITIES. HOWEVER, LACKING EXCAVATION, THE EXACT LOCATION OF UNDERGROUND FEATURES CANNOT BE ACCURATELY, COMPLETELY AND RELIABLY DEPICTED. WHERE ADDITIONAL OR MORE DETAILED INFORMATION IS REQUIRED, THE CLIENT IS ADVISED THAT EXCAVATION MAY BE NECESSARY.

   UTILITIES NOTED HEREON ARE SHOWN BASED ON SOURCE INFORMATION, WHEN AVAILABLE RECORD PLANS), AS OBTAINED FROM UTILITY COMPANIES AND/OR MUNICIPALITIES. LOCATIONS OF COMPILED UTILITIES SHOWN ARE TO BE CONSIDERED APPROXIMATE ONLY.

   - EXISTING SEWER COMPILED FROM MASTER PLAN SCHEMATIC.
   - WATER MAIN SHOWN ON THIS PLAN FROM WATER DEPARTMENT TIE CARD #5043 RECEIVED 4/26/2019.
   - GAS SERVICE SHOWN ON PLAN PER NATIONAL GRID PLAN #502570 RECEIVED 4/26/2019.
   - ELECTRIC LINE SHOWN ON THIS PLAN PER EVERSOURCE PLAN INDICATING OVERHEAD SERVICE RECEIVED 4/26/2019.

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PREPARED FOR:
SOUTHWORTH MASHPEE PROPERTIES, LLC
130 Willowbend Drive
Mashpee MA 02549

PROJECT TITLE
Willowbend Country Club Clubhouse Villas

		DATE	DESCRIPTION

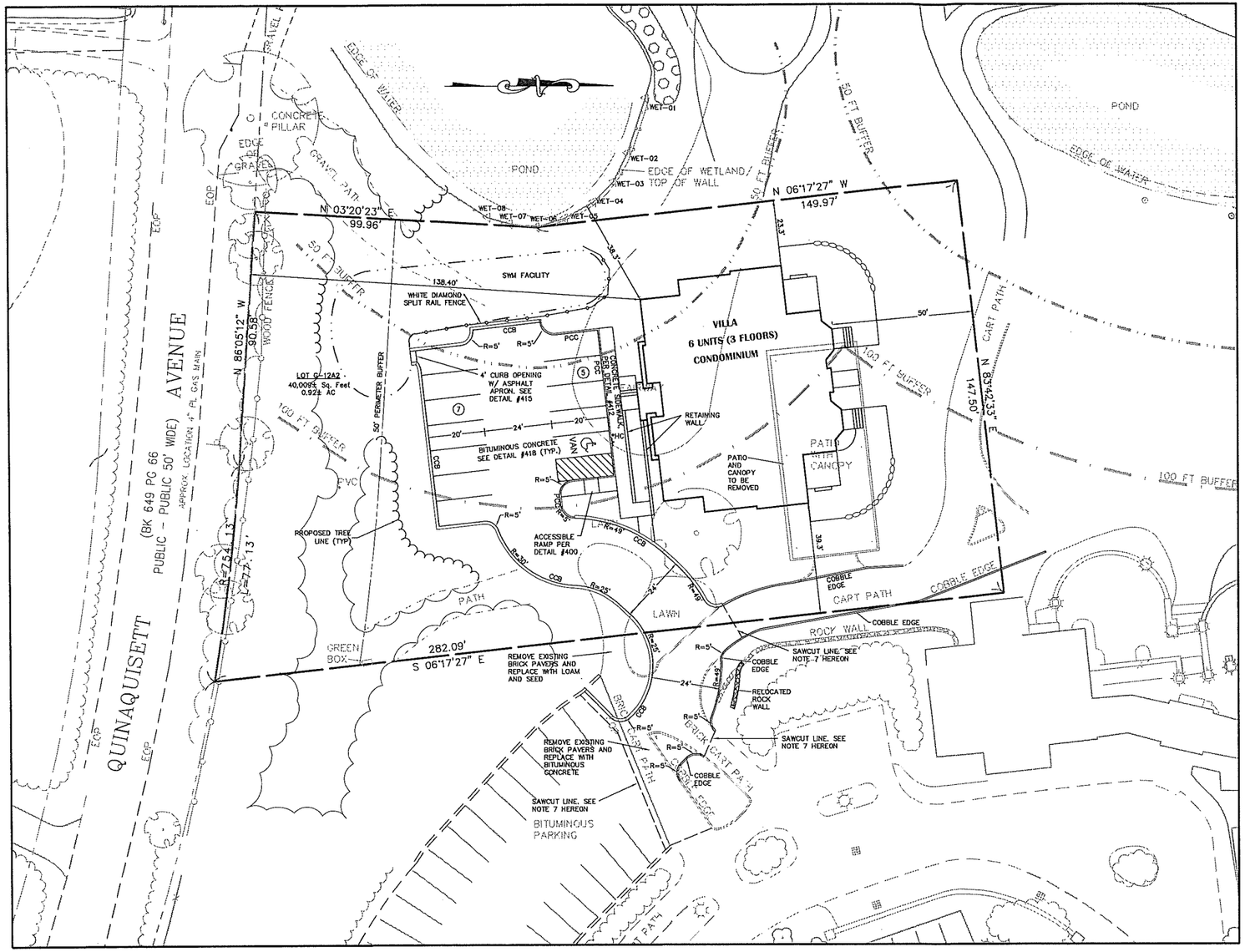
SHEET TITLE
Existing Conditions Plan

SHEET NO
C2.0

DATE: APRIL 14, 2020

20 0 20 40
SCALE IN FEET
SCALE: 1"=20'

DRAWN BY: SDM CHECKED BY: MWE
JOB NO: 2014-009 FILE: 2014-009 CLUB RMS EC.dwg



ZONING TABLE

ZONING DISTRICT: R-3 (Residential)
OVERLAY DISTRICTS: None

ALLOWED USE: RESIDENTIAL

EXIST USE: RESIDENTIAL, VACANT — PROPOSED USE: RESIDENTIAL MULTI-FAMILY

6 UNIT (LARGE TOWNHOUSE UNITS x 1 BLDGS = 6 UNITS

TOTAL NUMBER OF UNITS = 6 UNITS

TOTAL PARCEL AREA: 394,208± SF, 9.05± AC (LOT A - LOT B + LOT C)

	REQUIRED/ALLOWED (R3)	PROVIDED/PROPOSED
MIN. LOT AREA	40,000	40,009 SF
FRONTAGE	150 FT	167.88 FT.
PERIMETER SETBACK	50 FT	138.40 FT
MAX. BLDG. HEIGHT (STORIES)	2 STORIES/35 FT.	*3 STORIES -39 FT
MAX. % LOT COVERAGE (STRUCTURES) TOTAL PARCEL: 40,009± S.F.	20% (8,002± S.F.)	12% (4,786± SF)
PARKING TABLE		
RESIDENTIAL 2 PER UNIT (6 X 2 =12)	12 SPACES	12 PRKG. SPACES
TOTAL PARKING		12 SPACES
DESIGN VEHICLE		AASHTO SU

*VARIANCE REQUIRED

NOTES:

1. ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH MHDSS, TOWN ORDINANCES, REQUIREMENTS, AND SPECIFICATIONS.

2. THE CONTRACTOR SHALL CONTACT THE ENGINEER TO SCHEDULE A PRE-CONSTRUCTION MEETING AT LEAST TWO (2) WEEKS PRIOR TO COMMENCING CONSTRUCTION.

3. THE CONTRACTOR SHALL MAKE SUBMITTALS TO THE ENGINEER FOR APPROVAL BEFORE ANY FABRICATION OR DELIVERY OF PRODUCTS OR MATERIALS.

4. ALL PROPOSED WALKWAYS WILL BE HANDICAPPED ACCESSIBLE. ALL PROPOSED RUNNING SLOPES ON WALKWAYS SHALL BE LESS THAN 5% AND ALL CROSS SLOPES <2%. THESE ARE MAXIMUM SLOPES WITH NO TOLERANCE. ALL WORK WILL BE IN ACCORDANCE WITH THE MOST CURRENT REQUIREMENTS OF THE U.S. ACCESS BOARD, AMERICANS WITH DISABILITIES ACT & COMMONWEALTH OF MASSACHUSETTS, ARCHITECTURAL ACCESS BOARD.

5. EXISTING PAVING EDGES SHALL BE SAWCUT TO CREATE A CLEAN EDGE WHERE IT IS TO BE TIED INTO NEW PAVING, OR WHERE ASPHALT IS REMOVED ADJACENT TO ASPHALT WHICH IS TO REMAIN. BROKEN OR UNSTABLE PAVEMENT SHALL BE REMOVED AND SUBBASE REPLACED WITH SUITABLE COMPACTED MATERIAL PER PAVEMENT SECTION DETAIL HEREIN. ANY SAWCUT LINES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE EXACT EDGE OF SAWCUT SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD TO PROPERLY BLEND TO THE SURROUNDING GRADES. PROPOSED ASPHALT SHALL BE PROPERLY BUTTED AND BLENDED TO SURROUNDING ASPHALT WHICH IS TO REMAIN. THE BLENDED TRANSITION BETWEEN PROPOSED AND EXISTING ASPHALT SHALL BE WITH AN APPROXIMATE 1.5% GRADE UNLESS OTHERWISE IDENTIFIED. THE JOINT SHALL NOT BE ABRUPT.

6. DIMENSIONS SHOWN ARE TO OUTSIDE FACE OF FOUNDATION OR FACE OF CURB WHERE APPLICABLE.

7. ALL PAVEMENT MARKINGS AND STRIPING SHALL FOLLOW MUTCD STANDARDS. TYPICAL LINE WIDTH FOR LANE AND PARKING STALL STRIPING SHALL BE 4 INCHES UNLESS OTHERWISE NOTED. PARKING STALL COLOR SHALL BE WHITE, TYPICAL, UNLESS OTHERWISE NOTED.

8. BUILDING AND SITE SIGNAGE SHALL MEET REQUIREMENTS OF TOWN ZONING AND/OR SIGN ORDINANCES.

9. SITE LIGHTING - SEE ELECTRICAL DRAWINGS IN ARCHITECTURAL PLAN PACKAGE FOR DETAILED INFORMATION.

SIGN SUMMARY

M.U.T.C.D. NUMBER	SPECIFICATION WIDTH	SPECIFICATION HEIGHT	TEXT	QUANTITY
HC*	12"	18"	SEE LOCAL REQUIREMENTS (R7-8)	1

SIGN INSTALLER SHALL COORDINATE SPECIFIC SIGN INFORMATION AND WORDING REQUIREMENTS WITH LOCAL AGENCIES AS NECESSARY.

ALL SIGNAGE MUST BE IN CONFORMANCE WITH THE FEDERAL HIGHWAY ADMINISTRATION "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD), LATEST EDITION, ALL APPLICABLE CODES, AND LOCAL REQUIREMENTS. LOCAL REQUIREMENTS, WHEN THEY EXIST, SHALL SUPERCEDE MUTCD.

* ADD "VAN ACCESSIBLE" WHERE APPROPRIATE
* COLOR AND WORDING PER LOCAL REQUIREMENTS

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Mashpee MA 02549

PROJECT TITLE
Willowbend Country Club
Clubhouse Villas

DATE	DESCRIPTION

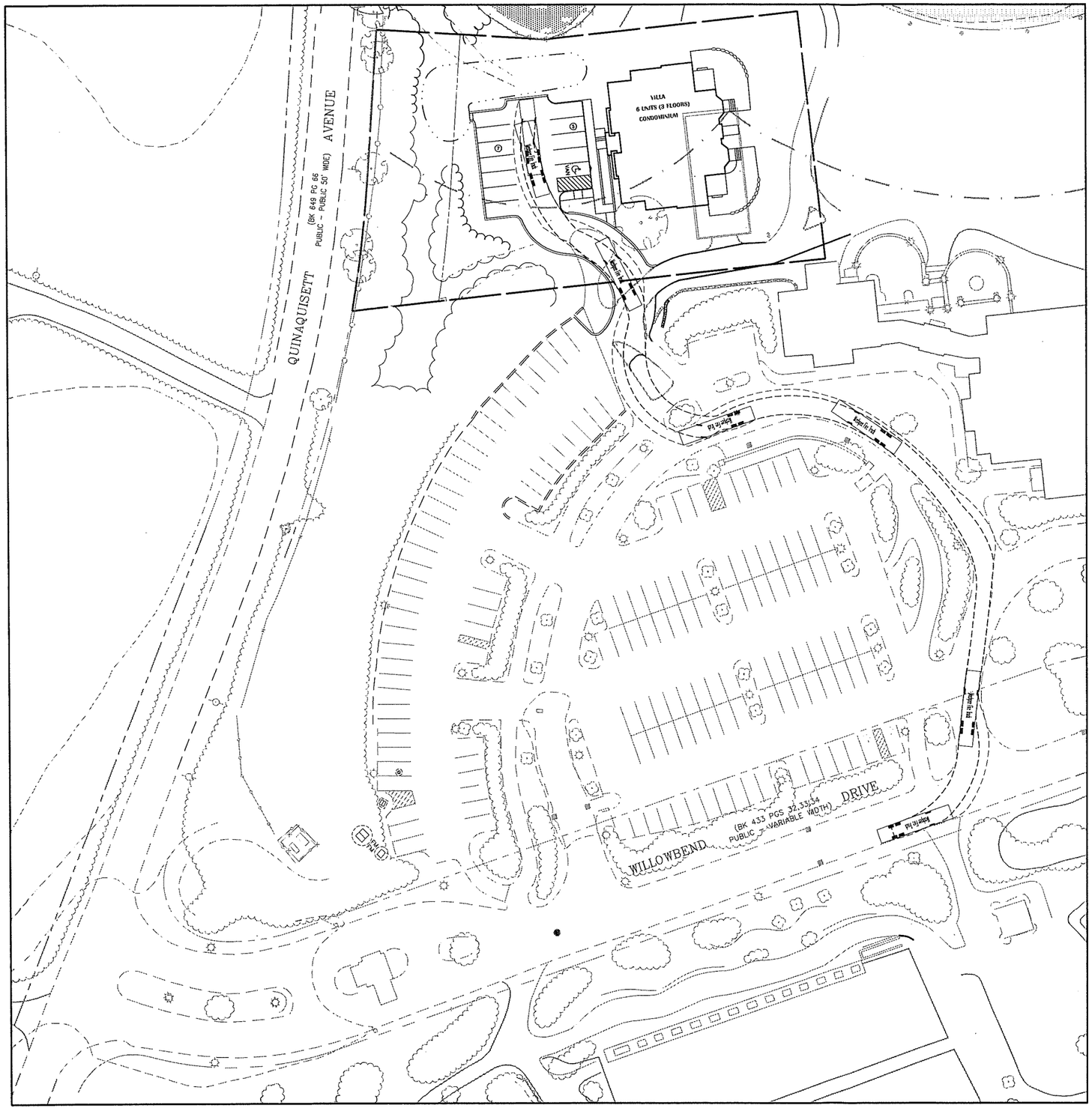
SHEET TITLE
Layout & Dimension Plan

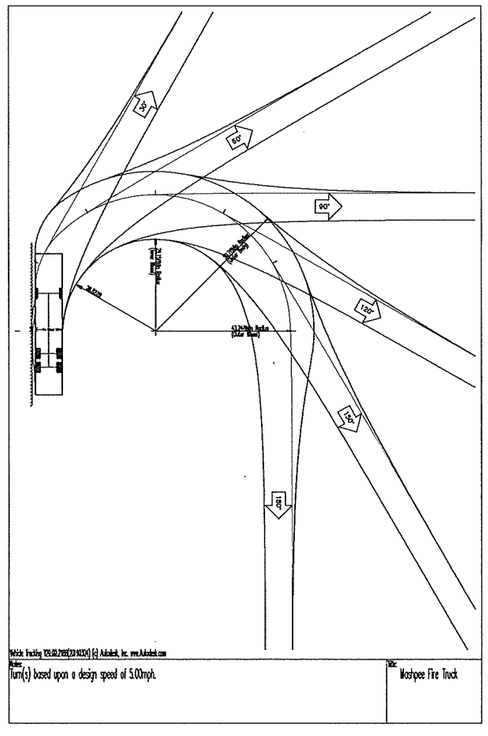
SHEET NO
C3.0

DATE: APRIL 14, 2020

20 0 20 40
SCALE IN FEET
SCALE: 1"=20'

DRAWN BY: SDM CHECKED BY: MWE
JOB NO: 2014-009 FILE: 2014-009 CLUB PLAN OVL.dwg





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PREPARED FOR:
SOUTHWORTH MASHPEE PROPERTIES, LLC
130 Willowbend Drive
Mashpee MA 02549

PROJECT TITLE
Willowbend Country Club
Clubhouse Villas

	DATE	DESCRIPTION

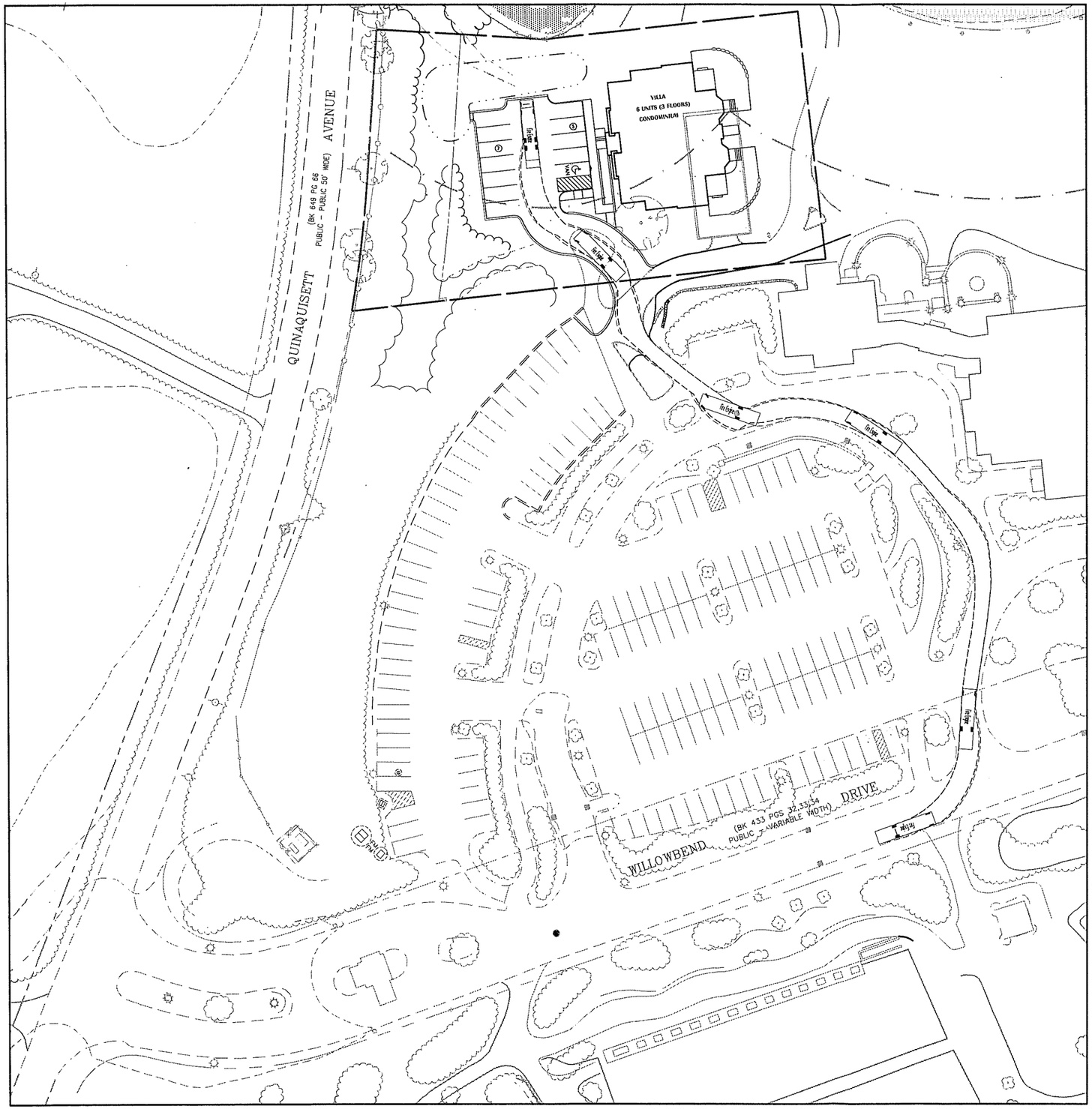
SHEET TITLE
Tower Truck Turning Template Plan

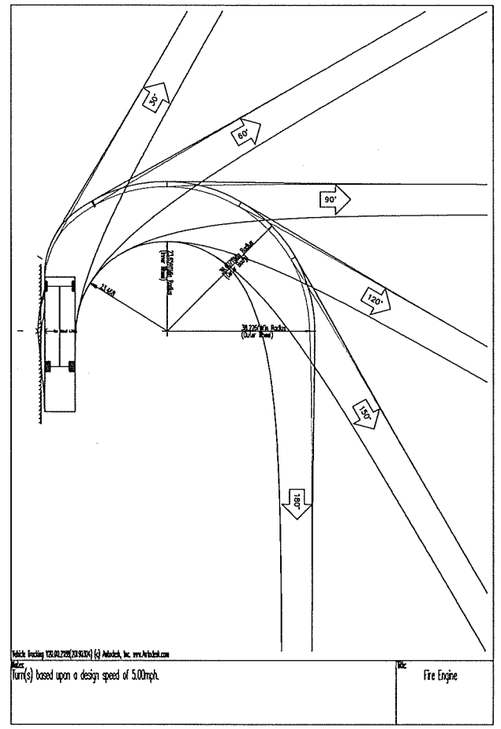
SHEET NO
C3.1

DATE: APRIL 14, 2020

30 0 30 60
SCALE IN FEET
SCALE: 1"=30'

DRAWN BY: SDM | CHECKED BY: MWE
JOB NO: 2014-009 | FILE: 2014-009 CLUB PLANS DM.dwg





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Mashpee MA 02549

PROJECT TITLE
Willowbend Country Club
Clubhouse Villas

	DATE	DESCRIPTION

SHEET TITLE
Fire Engine Turning Template Plan

SHEET NO
C3.1

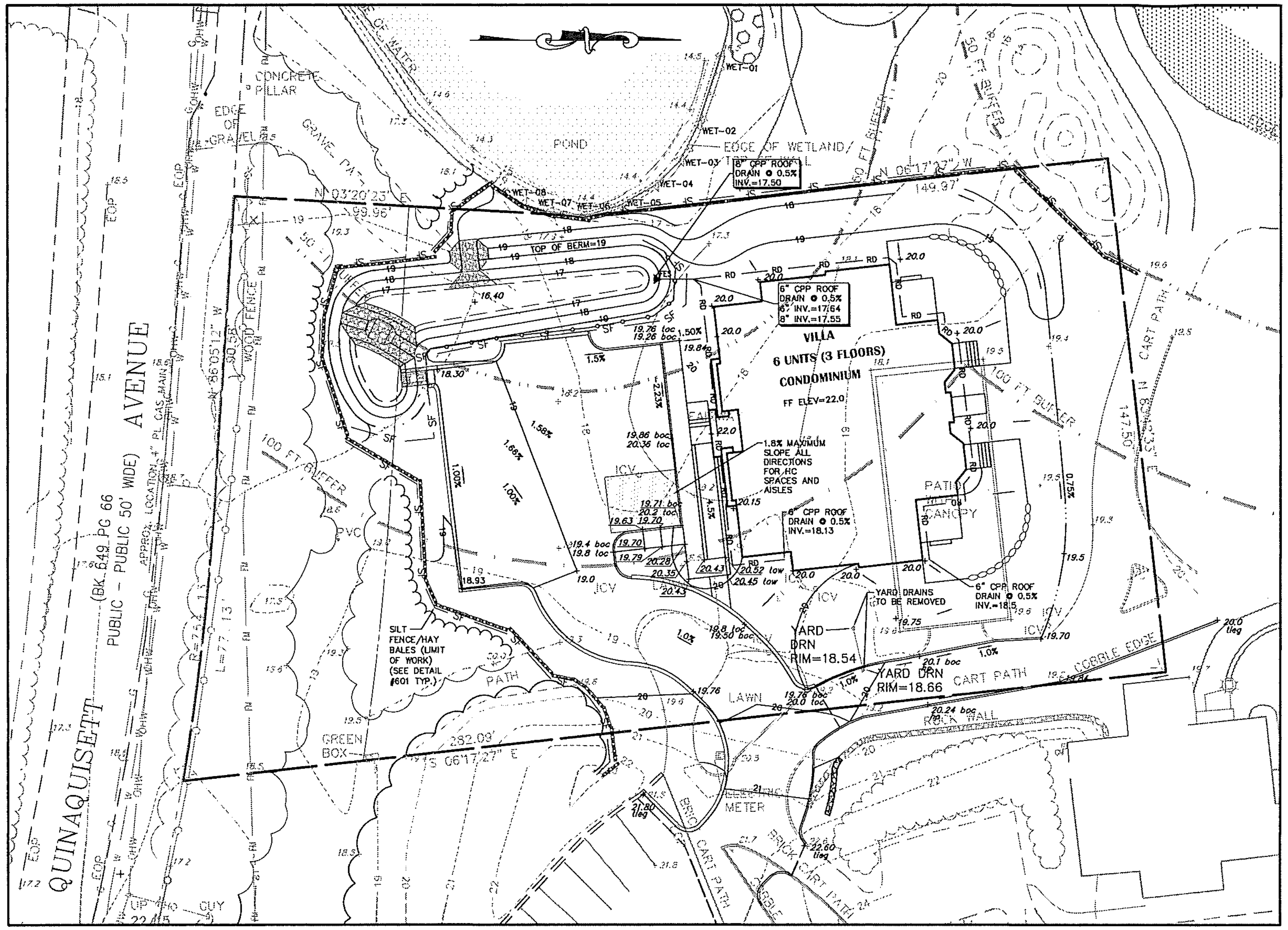
DATE: APRIL 14, 2020

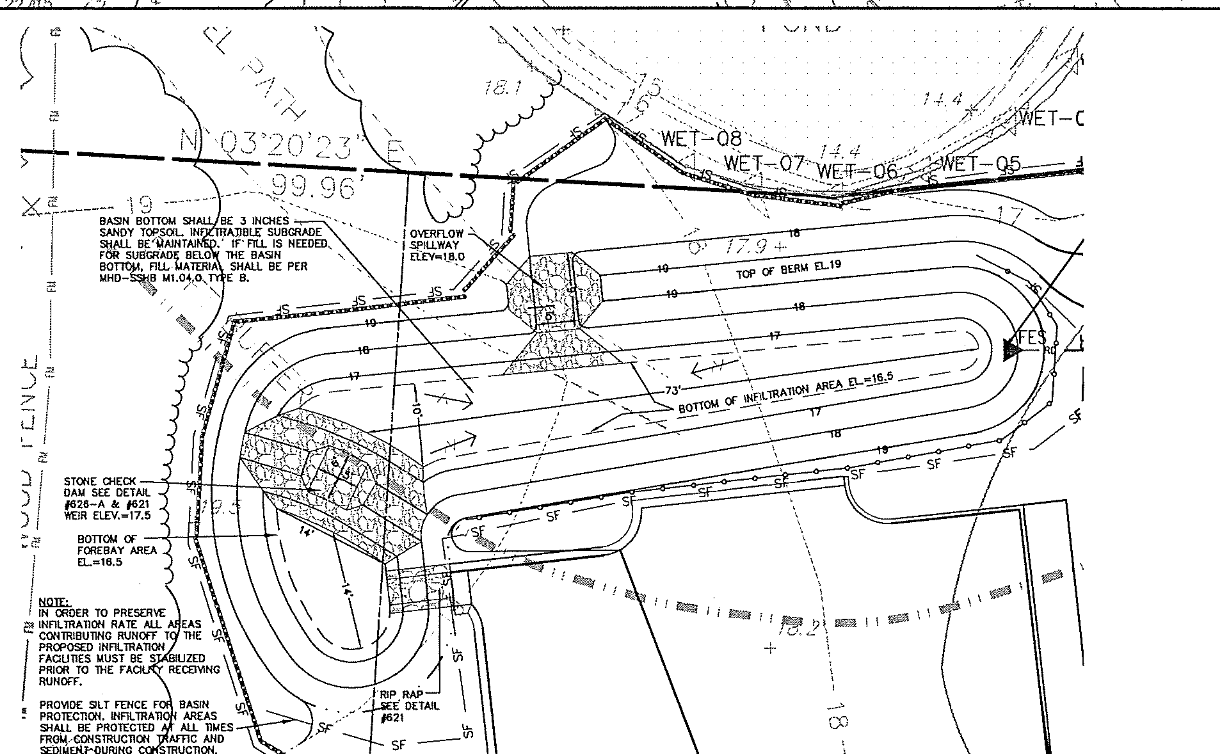
30 0 30 60
SCALE IN FEET

SCALE: 1"=30'

DRAWN BY: SDM | CHECKED BY: MWE

JOB NO: 2014-009 | FILE: 2014-009 CLUB PMS DM.dwg





SWM FACILITY DETAIL

10 0 10 20
SCALE IN FEET
1"= 10'

GRADING AND DRAINAGE NOTES:

1. DEBRIS, STUMPS, EXCESS, AND UNSUITABLE MATERIALS FROM THE CLEARING & DEMOLITION OPERATIONS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LEGAL MANNER BY THE CONTRACTOR.

2. DISTURBED AREAS SHALL BE PROTECTED AT ALL TIMES TO CONTROL SEDIMENT TRANSPORT BEYOND THE LIMIT OF WORK.

3. DISTURBED AREAS SHALL BE TREATED WITH WATER DURING EXCAVATION, OR APPROVED ALTERNATIVE, TO CONTROL THE DUST.

4. THE SITE SUBCONTRACTOR SHALL PROVIDE ALL EXCAVATION, BACKFILL AND COMPACTION NECESSARY TO ACHIEVE THE FINISH GRADES SHOWN ON THE PLANS AND FOR INSTALLATION OF BUILDING STRUCTURES, PAVING, STORMWATER MANAGEMENT AND ALL UTILITIES (INTERIOR AND EXTERIOR). SITE CONTRACTOR TO REFER TO SITE ELECTRICAL, MEP AND LANDSCAPE PLANS FOR ADDITIONAL INFORMATION AND DETAIL.

EXISTING PAVING EDGES SHALL BE SAW CUT TO CREATE A CLEAN EDGE WHERE IT IS TO BE TIED INTO NEW PAVING, OR WHERE ASPHALT IS REMOVED ADJACENT TO ASPHALT WHICH IS TO REMAIN. BROKEN OR UNSTABLE PAVEMENT SHALL BE REMOVED AND SUBBASE REPLACED WITH SUITABLE COMPACTED MATERIAL PER PAVEMENT SECTION DETAIL HEREIN. ANY SAWCUT LINES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE EXACT EDGE OF SAWCUT SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD TO PROPERLY BLEND TO THE SURROUNDING GRADES. PROPOSED ASPHALT SHALL BE PROPERLY BUTTED AND BLENDED TO SURROUNDING ASPHALT WHICH IS TO REMAIN. THE BLENDED TRANSITION BETWEEN PROPOSED AND EXISTING ASPHALT SHALL BE ACCOMPLISHED WITH AN APPROXIMATE 1.5% GRADE UNLESS OTHERWISE IDENTIFIED. THE JOINT SHALL NOT BE ABRUPT.

5. ALL PIPE OUTFALLS, CURB OPENINGS, STONE WEIRS, CHECK DAMS, AND OTHER DRAINAGE OVERFLOW AND OUTLET AREAS SHALL HAVE RIPRAP EXTENDED FROM THE OUTLET TO THE BOTTOM OF SLOPE WITH A MINIMUM 10 FT X 10 FT RIPRAP LEVEL SPREADER, UNLESS OTHERWISE SPECIFICALLY DETAILED. ALL STONE OUTFALLS SHALL BE PROPERLY SHAPED SO THE RUNOFF IS CONTAINED WITH THE STONE LINING. SEE TYPICAL DETAILS FOR ADDITIONAL INFORMATION.

6. ALL DISTURBED AREAS NOT OTHERWISE TREATED SHALL BE STABILIZED WITH 4" LOAM, SEED, & MULCH. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AREAS UNTIL VEGETATION HAS BEEN PERMANENTLY ESTABLISHED. SLOPES IN EXCESS OF 3:1 AND AREAS THAT SHOW SIGNS OF EROSION FROM CONCENTRATED FLOWS SHALL BE FURTHER STABILIZED WITH EROSION CONTROL BLANKETS (ECB) OF CURLEX DOUBLE NET – CURLEX II .98 BY AMERICAN EXCELSIOR COMPANY OR EQUAL. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE REQUIRED ECB'S AND PROPERLY STABILIZE ALL AREAS OF THE SITE.

ANY USE OF WOOD MULCH SHALL BE KEPT A MINIMUM OF 20" OFF ALL BUILDING FACES.

7. ALL DRAINAGE PIPING SHALL BE DESIGNED AND INSTALLED FOR H-20 LOADING.

8. A 25' MINIMUM SEPARATION SHALL BE MAINTAINED BETWEEN ALL STORM WATER MANAGEMENT INFILTRATION FACILITIES AND SANITARY SEWER/SEPTIC DISPOSAL AREAS AND HAZARDOUS STORAGE TANKS/FACILITIES. 10 FEET MINIMUM SEPARATION SHALL BE MAINTAINED BETWEEN ALL STORM WATER MANAGEMENT INFILTRATION FACILITIES AND SANITARY SEWER/SEPTIC LINES, MANHOLES AND TANKS.

9. CONTRACTOR TO VERIFY IN FIELD, WITH ENGINEER PRESENT, SOIL INFILTRATION RATE AND GROUNDWATER ELEVATION PRIOR TO ORDERING OF MATERIALS OR COMMENCEMENT OF CONSTRUCTION (ASSUMED 8.27 INCHES/HR. INFILTRATION RATE). IF RATE VARIES FROM ASSUMPTION OR GROUNDWATER IS PRESENT, SYSTEM MAY HAVE TO BE REDESIGNED AS DETERMINED BY THE ENGINEER. ANY MATERIALS ORDERED OR CONSTRUCTION COMMENCED PRIOR TO THIS OCCURRING IS AT THE CONTRACTORS OWN RISK.

UNSUITABLE MATERIALS ENCOUNTERED ADJACENT TO SOIL INFILTRATION LAYERS SHALL BE REMOVED FOR 5 FT AROUND THE LEACHING SYSTEMS/FACILITIES AND REPLACED WITH SAND BORROW PER MHD M.1.04.0 TYPE B.

10. CPP – HIGH DENSITY POLYETHYLENE CORRUGATED PIPE WITH SMOOTH INTERIOR WALL TO MEET ADS N-12 PIPE SPECIFICATION OR EQUAL. CPP PIPE USE SHALL BE ALLOWED AS NOTED, WITH A DIAMETER UP TO AND INCLUDING 24". BACK FILLING CPP MUST FOLLOW MANUFACTURER'S RECOMMENDATIONS AND SPECIAL CARE MUST BE EXERCISED (SEE ADS PRODUCT NOTE 3.115).

11. ALL ROOF DOWNSPOUTS SHALL BE TIED INTO ROOF DRAINS. REFER TO ARCHITECTURAL PLANS FOR ALL LOCATIONS OF DOWNSPOUTS. CONTRACTOR SHALL PROVIDE TIE-INS TO ALL DOWNSPOUT LOCATIONS. ROOF DRAINS TO BE AT LEAST 6" CPP AT 0.50% SLOPE MINIMUM, UNLESS OTHERWISE NOTED ON THE PLAN. MINIMUM TYPICAL COVER SHALL BE 2 FEET, U.O.N.

12. ALL PIPE INSTALLATIONS SHALL FOLLOW PROJECT SPECIFICATIONS AND PIPE MANUFACTURER RECOMMENDATIONS.

13. ALL GRADING WORK SHALL BE DONE IN A WORKMANLIKE MANNER ACCOMPLISHED TO CREATE POSITIVE DRAINAGE AND ELIMINATE ANY PUDDLING OR PONDING. WHERE NOT OTHERWISE NOTED OR DEFINED ON THE PLAN, ALL CUT AND FILL SHALL BE BLENDED TO DAYLIGHT AT EXISTING GRADE WITH A 3:1 SLOPE.

THE CONTRACTOR SHALL NOTIFY THE ENGINEER WITH ANY GRADE ISSUES OR QUESTIONS PRIOR TO PERFORMING THE FINISH GRADING WORK.

14. TYPICAL CURB REVEAL IS TO BE 6 INCHES (FOR VERTICAL FACE) UNLESS OTHERWISE NOTED BY TOP OF CURB (TOC) AND BOTTOM OF CURB (BOC) ELEVATIONS. WHERE THESE ARE NOTED THE CONTRACTOR SHALL REVIEW TO PROVIDE REQUIRED REVEALS AND THEN PROPERLY TAPER THE CURB AND FINISH GRADE BACK TO THE TYPICAL 6 INCH REVEAL. IF TOC OR BOC LABELS ARE NOT SHOWN, ALL SPOT ELEVATIONS ARE BOTTOM OF CURB WHEN ADJACENT TO A CURB FACE.

15. BOTTOM OF WALL (BOW) OR TOP OF WALL (TOW) ELEVATIONS FOR RETAINING WALLS NOTED ON THE PLAN ARE APPROXIMATE ELEVATIONS WHERE THE WALL IS EXPECTED TO DAYLIGHT WITH EXISTING GRADE. STRUCTURAL RETAINING WALL DESIGN IS DONE BY OTHERS AND THE BOW OR TOW EXISTING GROUND ELEVATIONS FOR WHERE THE WALL WOULD DAYLIGHT TO EXISTING GRADES SHALL BE VERIFIED AS NEEDED FOR THE STRUCTURAL DESIGN. THE ACTUAL BOW OR TOW ELEVATION AT THE PROPOSED WALL(S) MAY DIFFER FROM CONTOURS SHOWN ON THE PLANS ESPECIALLY AT STEEP SLOPES AREAS.

16. STORMWATER MANAGEMENT FACILITIES SHALL BE PROTECTED FROM SEDIMENT AND SILTATION AT ALL TIMES. JUST PRIOR TO COMPLETION, THE SITE SUBCONTRACTOR SHALL PERFORM A FINAL INSPECTION AND CLEANING OF THE STORM WATER MANAGEMENT SYSTEM. ALL SEDIMENT AND SILTATION SHALL BE REMOVED FROM THE BASINS, FOREBAYS, ETC. AND THESE AREAS SHALL BE SHAPED TO FINAL CONTOURS AND ELEVATION PER THE PLANS. ALL REPAIRS SHALL BE MADE AS NECESSARY TO THE SATISFACTION OF THE ENGINEER PRIOR TO PLACING FINAL TOPSOIL, MULCH, VEGETATION, SEEDING, ETC.

17. ANY DEWATERING OPERATION WHEN REQUIRED AS PART OF THE CONSTRUCTION PROCESS SHALL ENSURE ALL DEWATERING OCCURS THROUGH A PROPER DEWATERING BASIN (STONE, FILTER FABRIC AND HAYBALES OR OTHER ACCEPTABLE MEANS) PRIOR TO DISCHARGE FROM THE SITE.

18. ALL WORK WITHIN THESE PLANS SHALL BE PERFORMED AND PROVIDED BY THE CONTRACTOR IN ACCORDANCE WITH THE CONSTRUCTION DETAILS PROVIDED IN THIS PLAN SET WHETHER OR NOT THE DETAIL NUMBER IS SPECIFICALLY REFERENCED.

EXCAVATION/FILL NOTES:

1. SIDE SLOPES OF TRENCH EXCAVATIONS DEEPER THAN 4 FEET SHOULD BE FLATTENED (AS REQUIRED BY SITE CONDITIONS) TO AT LEAST 1H:1V OR SUPPORTED WITH TRENCH BOX OR SIMILAR DEVICE. ALL WORK SHALL BE PERFORMED SAFELY AND IN ACCORDANCE WITH OSHA AND MOSHA REQUIREMENTS. CONTRACTOR SHALL OBTAIN TRENCH PERMIT AS REQUIRED.

2. AFTER REMOVAL OF TOPSOIL AND INADEQUATE MATERIALS, GENERAL FILL SUBGRADE SHOULD BE PROOF-ROLLED WITH A LOADED 10-WHEEL TANDEM-AXLE DUMP TRUCK. THE PROOF-ROLLING SHOULD BE PERFORMED AS DIRECTED BY A GEOTECHNICAL ENGINEER. NO FILL SHOULD BE PLACED UNTIL THE SUBGRADE IS APPROVED BY A GEOTECHNICAL ENGINEER. BORROW MATERIALS FOR FILL OPERATIONS FOR GENERAL SITE GRADING SHOULD MEET AASHTO DESIGNATION A-2-4 (CLASS III) OR MORE GRANULAR AND BE APPROVED BY A GEOTECHNICAL ENGINEER. ALL FILLS SHOULD BE CONSTRUCTED IN 8" LOOSE LIFTS AND COMPACTED AS FOLLOWS, UNLESS OTHERWISE NOTED IN PROJECT SPECIFICATIONS:
- FILLS SUPPORTING FOUNDATIONS AND FLOOR SLABS, 95% OF ASTM D-1557 (AASHTO T-180)
- TOP 24 INCHES OF ROADWAY SUBGRADE AND SUBBASE, 95% OF ASTM D-1557 (AASHTO T-180)
- RETAINING WALLS AND FILLS WITHIN ROADWAY (BELOW TOP 24 INCHES OF SUBGRADE AND SUBBASE), 92% OF ASTM D-1557 (AASHTO T-180)
- FILLS IN GREEN SPACE, 90% OF ASTM D-1557 (AASHTO T-180)
- FILLS UNDER AND AROUND STRUCTURES, MANHOLES, TANKS, VAULTS, ETC. AND PIPE EMBEDMENT (BEDDING, HAUNCHING AND INITIAL BACK FILL), 95% OF ASTM D-1557 (AASHTO T-180)

OPERATION/MAINTENANCE PLAN

1. THIS OPERATION AND MAINTENANCE PLAN SHALL BE PERFORMED BY THE GENERAL CONTRACTOR DURING CONSTRUCTION OPERATIONS AND BY THE OWNER ONCE THE FACILITIES ARE COMPLETED AND PUT INTO OPERATION:

2. PERSONNEL ASSOCIATED WITH THE CONSTRUCTION OF THIS PROJECT SHALL BE INFORMED THAT THE MAINTENANCE OF SILTATION CONTROLS TAKES PRECEDENCE OVER NORMAL CONSTRUCTION ACTIVITIES. ADJACENT PROPERTIES AND STREETS SHALL BE PROTECTED FROM EROSION OR SILTATION CONDITIONS.

3. INSPECTION AND MAINTENANCE, AS OUTLINED HEREIN, SHALL BE PERFORMED FOUR TIMES WITHIN THE FIRST YEAR OF OPERATION. THENCE, INSPECTIONS AND MAINTENANCE SHALL BE CONDUCTED ON A SEMIANNUAL BASIS (2 TIMES A YR.) AND AFTER ALL LARGE STORMS. AN INSPECTION REPORT SHALL BE MAINTAINED.

4. ACCUMULATED DEBRIS IN CATCH BASINS, WATER QUALITY INLETS, OIL/WATER SEPARATORS AND LEACHING BASINS SHALL BE REMOVED BEFORE IT EXCEEDS 12 INCHES IN DEPTH AND DISPOSED OF PROPERLY. BROKEN OR DAMAGED GAS TRAPS/HOODS SHALL BE IMMEDIATELY REPAIRED OR REPLACED TO ENSURE ADEQUATE FUNCTION.

5. A VISUAL INSPECTION SHALL BE MADE AT ALL DRAINAGE CHANNELS FOR THE ENTIRE STORM DRAINAGE SYSTEM. THE GENERAL CONDITION OF THESE SYSTEMS SHOULD BE REVIEWED AND ACCUMULATED DEBRIS SHALL BE REMOVED. THE CONDITION OF ALL OUTLETS SHALL BE NOTED AND A DESCRIPTION OF THE DRAINAGE SYSTEMS SHALL BE INCLUDED IN THE REPORT. DELETERIOUS MATERIALS SHALL BE REMOVED FROM THE DRAINAGE CHANNELS IN ORDER FOR THE SYSTEM TO FUNCTION PROPERLY.

6. ALL OUTLETS, DRAINING CHANNELS, AND SLOPES SHALL BE KEPT STABILIZED. ANY EROSION SHALL BE REPAIRED IMMEDIATELY.

7. ACCUMULATED SEDIMENT SHALL BE REMOVED FROM THE SWM BASIN BEFORE IT EXCEEDS 1' IN DEPTH, OR AT LEAST ONCE EVERY 5 YEARS. THE LOW FLOW OUTLET SHALL BE CLEANED AND INSPECTED FOR PROPER FUNCTIONING. ALL DEBRIS OR DELETERIOUS MATERIAL SHALL BE REMOVED. BASIN SLOPES SHALL BE MAINTAINED WITH A GRASS STAND OF AT LEAST 3". GRASS SHALL BE MOWED AT LEAST TWICE A YEAR AND CLIPPINGS SHALL NOT BE LEFT IN BASIN. ANY TREES OR OTHER WOODY VEGETATION GROWING IN EMBANKMENTS OR NEAR CONTROL STRUCTURE SHALL BE REMOVED.

8. THE FOLLOWING MINIMUM INFORMATION SHALL BE RECORDED:
- DATE OF INSPECTION
- GENERAL CONDITION OF THE ENTIRE SYSTEM
- CORRECTIVE MAINTENANCE ACTIONS TAKEN TO ENSURE ADEQUATE FUNCTION AND WHEN PERFORMED.
- A COPY OF THESE INSPECTION REPORTS SHALL BE FURNISHED TO THE PLANNING BOARD UPON REQUEST.

9. MAINTENANCE OF THE STORMWATER MANAGEMENT FACILITY SHALL BE IN ACCORDANCE WITH THE EXECUTED INSPECTION AND MAINTENANCE AGREEMENT FOR PRIVATE STORMWATER MANAGEMENT FACILITIES AND SHALL BE THE RESPONSIBILITY OF THE OWNER AND THE ASSIGNEES.

10. THE CONTRACTOR MUST NOTIFY THE BUILDING DEPARTMENT AND THE PLANNING BOARD ENGINEER AT LEAST TWO (2) DAYS PRIOR TO THE START OF CONSTRUCTION.

ABBREVIATIONS

BOC	BOTTOM OF CURB
BOS	BOTTOM OF SLOPE
BOW	BOTTOM OF WALL
FF	FINISHED FLOOR ELEVATION
GB	GRADE BREAK
HP	HIGH POINT
LP	LOW POINT
TOC	TOP OF CURB
TOW	TOP OF WALL

CONSTRUCTION SEQUENCE

1. INSTALL SILT FENCING/HAY BALES TO ESTABLISH THE LIMIT OF WORK AS SHOWN ON PLAN.
2. CONSTRUCT TEMPORARY CONSTRUCTION ENTRANCES AT POINTS OF EGRESS FROM THE SITE DURING CONSTRUCTION.
3. DISCHARGES FROM DEWATERING OF EXCAVATIONS SHALL NOT BE DIVERTED DIRECTLY INTO ANY WETLANDS OR EXISTING STORM DRAINS WITHOUT PRETREATMENT VIA SETTLING BASINS.
4. INSTALL HAY BALE CHECK DAMS ALONG CENTER OF SWALES AT 100' O.C., AS NECESSARY.
5. CLEAR AND GRUB SITE WITHIN THE LIMIT OF WORK.
6. CONSTRUCT SWM BASIN TO WITHIN 1 FT OF FINAL BOTTOM ELEVATION. BASIN TO BE USED AS SEDIMENT TRAP.
7. ESTABLISH ROUGH SUB GRADES FOR PARKING LOT AND BUILDING PLATFORM.
8. PERFORM BUILDING AND SITE CONSTRUCTION. INSTALL BASE COURSE PAVING AS SOON AS PRACTICAL.
9. INSPECT AND MAINTAIN EROSION CONTROL MEASURES AFTER RAINFALL EVENTS AND A MINIMUM OF ONCE PER WEEK.
10. REMOVE SEDIMENT BUILDUP AT EROSION CONTROL DEVICES AS NEEDED. REDISTRIBUTE MATERIAL OVER SITE IN CONFORMANCE WITH EARTHWORK SPECIFICATIONS.
11. ONCE ALL DRAINAGE STRUCTURES ARE INSTALLED, INSTALL FILTER FABRIC AND STONE OR HAY BALES AROUND ALL NEW STRUCTURES AND MAINTAIN THEM UNTIL PAVEMENT IS IN PLACE AND VEGETATION IS ESTABLISHED. ALL OUT FALLS SHALL BE STABILIZED WITH STONE PROTECTION AS REQUIRED.
12. ALL CUT AND FILL SLOPES SHALL BE TEMPORARILY STABILIZED WITH TOP SOIL, SEED AND MULCH OR CURLEX AS REQUIRED IF CONSTRUCTION ACTIVITY CEASES ON SAID SLOPES FOR A PERIOD OF 14 DAYS OR GREATER. ALL SLOPES SHALL BE PERMANENTLY STABILIZED AS REQUIRED IMMEDIATELY UPON COMPLETION OF FINAL GRADING.
13. PROVIDE SILT FENCE FOR INFILTRATION PROTECTION. INFILTRATION AREAS SHALL BE PROTECTED AT ALL TIMES FROM CONSTRUCTION TRAFFIC AND SEDIMENT DURING CONSTRUCTION.
14. COMPLETE FINISH GRADING AND STABILIZATION OF SITE. PLACE FINAL PAVING COURSE.
15. REMOVE SEDIMENT FROM ALL DRAINAGE STRUCTURES, PIPES AFTER COMPLETION OF CONSTRUCTION. REMOVE AND REGRADE TEMPORARY BERMS, SWALES, CHECK DAMS, ETC. STABILIZE DISTURBED AREAS.
16. CLEAN OUT ALL SEDIMENT FROM SWM BASIN AND OUTLET STRUCTURES. REGRADE TO CONTOURS PER DESIGN. INSTALL FINAL TOPSOIL MATERIALS IN STORMWATER MANAGEMENT BASINS. STABILIZE ALL SLOPES AS REQUIRED.
17. UPON ESTABLISHMENT OF PERMANENT GROUND COVER AND APPROVAL BY THE ENGINEER, REMOVE HAY BALES & SILT FENCE. STABILIZE ALL AREAS WHERE HAYBALES WHERE REMOVED.

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PROJECT TITLE
Willowbend Country Club
Clubhouse Villas

DATE	DESCRIPTION

SHEET TITLE
Grading & Drainage Plan Notes & Details

SHEET NO
C4.0

DATE: APRIL 08, 2020

20 0 20 40
SCALE IN FEET
SCALE: 1"=20'

DRAWN BY: SDM CHECKED BY: MWE
JOB NO: 2014-009 FILE: 2014-009 CLUB RMS G2.dwg

SWM SPECIFICATIONS

ALL MATERIALS AND WORK SHALL BE IN ACCORDANCE WITH THE MASSDOT/MASSHIGHWAY STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES (MHDSS), SPECIFIC ON-SITE SOIL SPECIFICATIONS IF A GEOTECHNICAL REPORTS WAS PERFORMED, AND THE PLANS HEREIN. WHERE CONFLICTS OF INFORMATION EXIST, THE MORE RESTRICTIVE SHALL APPLY. ALL REFERENCES TO ASTM AND AASHTO SPECIFICATIONS APPLY TO THE MOST RECENT VERSION.

(NOTE: THE CONTRACTOR SHALL BE RESPONSIBLE TO FULLY UNDERSTAND THIS INFORMATION AND INTENT OF THE SWM FACILITIES AND SHALL REVIEW THIS INFORMATION WITH THE ENGINEER AS NEEDED.

SITE PREPARATION AND GRADING:

AREAS DESIGNATED FOR BORROW AREAS, EMBANKMENT, AND STRUCTURAL WORKS SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL. ALL TREES, VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED. CHANNEL BANKS AND SHARP BREAKS SHALL BE SLOPED TO NO STEEPER THAN 1:1.

AREAS TO BE COVERED BY THE INFILTRATION AREA, BASIN OR RESERVOIR WILL BE CLEARED OF ALL TREES, BRUSH, LOGS, FENCES, RUBBISH AND OTHER OBJECTIONABLE MATERIAL UNLESS OTHERWISE DESIGNATED ON THE PLANS. TREES, BRUSH AND STUMPS SHALL BE CUT APPROXIMATELY LEVEL WITH THE GROUND SURFACE. FOR DRY STORMWATER MANAGEMENT PONDS, A MINIMUM OF A 50-FOOT RADIUS AROUND THE INLET STRUCTURE SHALL BE CLEARED. ALL CLEARED AND GRUBBED MATERIAL SHALL BE DISPOSED OF OUTSIDE AND BELOW THE LIMITS OF THE DAM, BASIN AND RESERVOIR AS DIRECTED BY THE OWNER OR HIS REPRESENTATIVE.

THE CONTRACTOR SHALL ENSURE ALL SWM AREAS WHICH ARE DESIGNED FOR INFILTRATION SHALL HAVE THEIR EXISTING INFILTRATABLE SUBSOIL CONDITIONS UNCHANGED AT THE HEREIN SPECIFIED ELEVATIONS FOR THE STORMWATER MANAGEMENT FACILITY. THE INFILTRATABLE LAYER BELOW THE DESIGN ELEVATION SHALL NOT BE MINED, ALTERED OR AFFECTED FROM CONSTRUCTION IN ANY WAY. WITHIN BASIN FOOTPRINTS, BOTTOMS, AND NON-EMBANKMENT (NON-DAM) SIDESLOPES, NO UNSUITABLE OR LESS PERVIOUS MATERIAL SHALL BE PLACED OVER THESE LAYERS WHICH COULD AFFECT THE INFILTRATION RATE, UNLESS OTHERWISE SPECIFICALLY IDENTIFIED BY THE ENGINEER. IF SUBGRADE FILL IS NEEDED FOR SWM INFILTRATION BOTTOM AND NON-EMBANKMENT (NON-DAM) SIDE SLOPE AREAS, THE FILL SHALL MEET THE SPECIFICATIONS OF MHD-SSHB M.1.04.0 TYPE B. FILL IN AREAS OF INFILTRATION SHALL NOT BE OVERLY COMPACTED. INFILTRATION AREAS SHALL BE PROTECTED FROM EXCESSIVE CONSTRUCTION EQUIPMENT MOVEMENT AND SEDIMENT/EROSION RUNOFF SO AS TO PRESERVE THE INFILTRATION CHARACTERISTICS. (NOTE: FILL DAM EMBANKMENTS SHALL HAVE AN IMPERVIOUS CORE AS NOTED BELOW AND IN THE SWM DETAILS AND CROSS SECTIONS). THE CONTRACTOR SHALL BE RESPONSIBLE TO FULLY UNDERSTAND THIS INFORMATION AND INTENT OF THE SWM FACILITIES AND SHALL REVIEW THIS INFORMATION WITH THE ENGINEER AS NEEDED.

TOPSOIL OR PLANTING MATERIAL REQUIRED FOR SEEDING, SOD OR VEGETATION GROWTH ON THE BASIN BOTTOM AND NON-EMBANKMENT SIDESLOPES, SHALL BE PLACED IN ONLY A THREE (3) INCH SURFACE DEPTH OF LOAMY SAND OR SANDY LOAM TOPSOIL (EXCESSIVE TOPSOIL SHALL NOT BE PLACED WHERE INFILTRATION IS USED). THE TOPSOIL SHALL NOT INHIBIT THE INFILTRATION RATE OF THE FACILITY. THE TOPSOIL SHALL BE LESS THAN 5% CLAY CONTENT (AND <5% MATERIALS PASSING THE #200 SIEVE), CORRECTED PH 5.5-6.5, AND ORGANIC MATTER OF BETWEEN 1.5% TO 3%.

THREE (3) INCHES OF HARDWOOD MULCH SHALL BE PLACED AROUND REQUIRED SHRUBS AND OTHER SPECIFIED LANDSCAPE PLANTINGS. MULCH SHALL BE PLACED ACROSS THE BOTTOM OF BIO-RETENTION AREAS IF SPECIFIED IN THE PLAN DETAILS. WHERE A PLANTING PLAN OR SCHEDULE IS NOT IDENTIFIED FOR THE SWM FACILITIES, THEN THE BOTTOM AND SIDE SLOPES OF SWM BASINS AND BIORETENTION FACILITIES SHALL BE STABILIZED AND SEEDED AS FOLLOWS:

- BOTTOM OF BASINS/FACILITES SHALL BE SEEDED AND STABILIZED WITH "NEW ENGLAND CONSERVATION AND WILDLIFE SEED MIX".
- SIDE SLOPES SHALL BE SEEDED AND STABILIZED WITH "NEW ENGLAND EROSION CONTROL/RESTORATION SEED MIX".
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING EROSION, CLEANOUT OF SEDIMENT FROM EROSION, AND RESEEDING AS NEEDED UNTIL FULL STABILIZATION IS ACHIEVED. THIS SHALL BE REQUIRED THROUGH TWO GROWING SEASONS.

NO OTHER MATERIALS UNLESS SPECIFICALLY IDENTIFIED AND REVIEWED BY THE ENGINEER, SHALL BE PLACED ON THE BASIN BOTTOM.

EARTH FILL FOR EMBANKMENTS ONLY:

MATERIAL – THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED DESIGNATED BORROW AREAS. IT SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6", FROZEN OR OTHER OBJECTIONABLE MATERIALS. FILL MATERIAL FOR THE CENTER OF THE DAM EMBANKMENT AND CUT OFF TRENCH WHICH ARE TO BE IMPERMEABLE SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION GC, SC, CH OR CL. CONSIDERATION MAY BE GIVEN TO THE USE OF OTHER MATERIALS IN THE EMBANKMENT IF DESIGN AND CONSTRUCTION ARE SUPERVISED BY A GEOTECHNICAL ENGINEER.

PLACEMENT – AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED PRIOR TO PLACEMENT OF FILL. FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8 INCH THICK (BEFORE COMPACTION) LAYERS AND ARE TO BE CONTINUOUS OVER THE ENTIRE LENGTH OF THE FILL. THE MOST PERMEABLE BORROW MATERIAL SHALL BE PLACED IN THE DOWNSTREAM PORTIONS OF THE DAM EMBANKMENT. THE PRINCIPAL SPILLWAY MUST BE INSTALLED CONCURRENTLY WITH FILL PLACEMENT AND NOT EXCAVATED INTO THE EMBANKMENT.

COMPACTION – THE MOVEMENT OF THE HAULING AND SPREADING EQUIPMENT OVER THE EMBANKMENT FILL SHALL BE CONTROLLED SO THAT THE ENTIRE SURFACE OF EACH LIFT SHALL BE TRAVERSED BY NOT LESS THAN ONE TREAD TRACK OF THE EQUIPMENT OR COMPACTION SHALL BE ACHIEVED BY A MINIMUM OF FOUR COMPLETE PASSES OF A SHEEPSFOOT, RUBBER TIRED OR VIBRATORY ROLLER (COMPACTION OF 95% STANDARD PROCTOR SHALL BE ACHIEVED). FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SUCH THAT THE REQUIRED DEGREE OF COMPACTION WILL BE OBTAINED WITH THE EQUIPMENT USED. THE FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SO THAT IF FORMED INTO A BALL IT WILL NOT CRUMBLE YET NOT BE SO WET THAT WATER CAN BE SQUEEZED OUT.

A MINIMUM REQUIRED DENSITY SHALL NOT BE LESS THAN 95% OF MAXIMUM DRY DENSITY WITH A MOISTURE CONTENT WITHIN ±2% OF OPTIMUM. EACH LAYER OF FILL SHALL BE COMPACTED AS NECESSARY TO OBTAIN THAT DENSITY, AND IS TO BE TESTED AND CERTIFIED BY A GEOTECHNICAL ENGINEER AT THE TIME OF CONSTRUCTION. ALL COMPACTION IS TO BE DETERMINED BY AASHTO METHOD T-99.

CUT OFF TRENCH – THE CUTOFF TRENCH SHALL BE EXCAVATED INTO IMPERVIOUS MATERIAL ALONG OR PARALLEL TO THE CENTERLINE OF THE EMBANKMENT AS SHOWN ON THE PLANS. THE BOTTOM WIDTH OF THE TRENCH SHALL BE GOVERNED BY THE EQUIPMENT USED FOR EXCAVATION, WITH THE MINIMUM WIDTH BEING FOUR FEET. THE DEPTH SHALL BE AT LEAST FOUR FEET BELOW EXISTING GRADE OR AS SHOWN ON THE PLANS. THE SIDE SLOPES OF THE TRENCH SHALL BE 1 TO 1 OR FLATTER. THE BACKFILL SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY.

STRUCTURE BACKFILL

BACKFILL ADJACENT TO PIPES OR STRUCTURES SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE ADJOINING FILL MATERIAL. THE FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL NEEDS TO FILL COMPLETELY ALL SPACES UNDER AND ADJACENT TO THE PIPE. AT NO TIME DURING THE BACKFILLING OPERATIONS SHALL DRIVEN EQUIPMENT BE ALLOWED OVER OR WITHIN 4 FEET OF A CONCRETE STRUCTURE OR PIPE, UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE.

RIP-RAP

ROCK RIPRAP SHALL MEET THE REQUIREMENTS OF MHDSS.

THE RIPRAP SHALL BE PLACED TO THE REQUIRED THICKNESS IN ONE OPERATION. THE ROCK SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL INSURE THAT THE RIPRAP IN PLACE SHALL BE REASONABLY HOMOGENEOUS WITH THE LARGER ROCKS UNIFORMLY DISTRIBUTED AND FIRMLY IN CONTACT ONE TO ANOTHER WITH THE SMALLER ROCKS FILLING THE VOIDS BETWEEN THE LARGER ROCKS. FILTER CLOTH SHALL BE PLACED UNDER ALL RIPRAP AND SHALL MEET THE REQUIREMENTS OF MHDSS.

CHAMBERS

ALL CHAMBERS (PLASTIC AND CONCRETE) SHALL BE HANDLED AND INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, GUIDELINES, AND REQUIREMENTS.

PIPE CONDUITS

ALL PIPES SHALL BE CIRCULAR IN CROSS SECTION.

REINFORCED CONCRETE PIPE–

ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR REINFORCED CONCRETE PIPE:

1. MATERIALS – REINFORCED CONCRETE PIPE SHALL HAVE BELL AND SPIGOT JOINTS WITH RUBBER GASKETS AND SHALL EQUAL OR EXCEED ASTM C-361. THIS BEDDING SHALL CONSIST OF HIGH SLUMP CONCRETE PLACED UNDER THE PIPE AND UP THE SIDES OF THE PIPE AT LEAST 10% OF ITS OUTSIDE DIAMETER WITH A MINIMUM THICKNESS OF 3 INCHES, OR AS SHOWN ON THE DRAWINGS.

2. BEDDING – ALL REINFORCED CONCRETE PIPE CONDUITS SHALL BE LAID IN A CONCRETE BEDDING FOR THEIR ENTIRE LENGTH.

3. LAYING PIPE – BELL AND SPIGOT PIPE SHALL BE PLACED WITH THE BELL END UPSTREAM. JOINTS SHALL BE MADE IN ACCORDANCE WITH RECOMMENDATIONS OF THE MANUFACTURER OF THE MATERIAL. AFTER THE JOINTS ARE SEALED FOR THE ENTIRE LINE, THE BEDDING SHALL BE PLACED SO THAT ALL SPACES UNDER THE PIPE ARE FILLED. CARE SHALL BE EXERCISED TO PREVENT ANY DEVIATION FROM THE ORIGINAL LINE AND GRADE OF THE PIPE. THE FIRST JOINT MUST BE LOCATED WITHIN 2 FEET FROM THE RISER.

4. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".

5. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

POLYVINYL CHLORIDE (PVC) PIPE–

ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR POLYVINYL CHLORIDE (PVC) PIPE:

1. MATERIALS – PVC PIPE SHALL BE PVC-1120 OR PVC-1220 CONFORMING TO ASTM D-1785 OR ASTM D-2241.

2. JOINTS AND CONNECTIONS TO ANTI-SEEP COLLARS SHALL BE COMPLETELY WATERTIGHT.

3. BEDDING – THE PIPE SHALL BE FIRMLY AND UNIFORMLY BEDDED THROUGHOUT ITS ENTIRE LENGTH. WHERE ROCK OR SOFT, SPONGY OR OTHER UNSTABLE SOIL IS ENCOUNTERED, ALL SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE EARTH COMPACTED TO PROVIDE ADEQUATE SUPPORT.

4. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".

5. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

CONCRETE

CONCRETE SHALL MEET THE REQUIREMENTS OF MHDSS.

ROCK RIPRAP ROCK RIPRAP SHALL MEET THE REQUIREMENTS OF MHDSS.

THE RIPRAP SHALL BE PLACED TO THE REQUIRED THICKNESS IN ONE OPERATION. THE ROCK SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL INSURE THE RIPRAP IN PLACE SHALL BE REASONABLY HOMOGENEOUS WITH THE LARGER ROCKS UNIFORMLY DISTRIBUTED AND FIRMLY IN CONTACT ONE TO ANOTHER WITH THE SMALLER ROCKS FILLING THE VOIDS BETWEEN THE LARGER ROCKS. FILTER CLOTH SHALL BE PLACED UNDER ALL RIPRAP AND SHALL MEET THE REQUIREMENTS OF MHDSS.

LOW FLOW ORIFICE (IF IDENTIFIED ON PLAN AS NEEDED):
PERFORATED PIPE FOR LENGTH WITHIN BASIN TO UPSTREAM SIDE TOE OF OVERFLOW SLOPE, AND NON-PERFORATED PIPE AS NEEDED TO EXTEND UNDER OVERFLOW WEIR TO OUTLET.
EXTEND CLEANOUT PIPES TO SURFACE WITH VENTED CAPS AT TEES AND WYES.
ANY CLEANOUTS IN AREA SUBJECT TO VEHICULAR LOADING SHALL BE INSTALLED WITH CONCRETE COLLARS.

CARE OF WATER DURING CONSTRUCTION

ALL WORK ON PERMANENT STRUCTURES SHALL BE CARRIED OUT IN AREAS FREE FROM WATER. THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN ALL TEMPORARY DIKES, LEVEES, COFFER DAMS, DRAINAGE CHANNELS, AND STREAM DIVERSIONS NECESSARY TO PROTECT THE AREAS TO BE OCCUPIED BY THE PERMANENT WORKS. THE CONTRACTOR SHALL ALSO FURNISH, INSTALL, OPERATE AND MAINTAIN ALL NECESSARY PUMPING AND OTHER EQUIPMENT REQUIRED FOR REMOVAL OF WATER FROM THE VARIOUS PARTS OF THE WORK AND FOR MAINTAINING THE EXCAVATIONS, FOUNDATION AND OTHER PARTS OF THE WORK FREE FROM WATER AS REQUIRED OR DIRECTED BY THE ENGINEER FOR CONSTRUCTING EACH PART OF THE WORK. AFTER HAVING SERVED THEIR PURPOSE, ALL TEMPORARY PROTECTIVE WORKS SHALL BE REMOVED OR LEVELED AND GRADED TO THE EXTENT REQUIRED TO PREVENT OBSTRUCTION IN ANY DEGREE WHATSOEVER OF THE FLOW OF WATER TO THE SPILLWAY OR OUTLET WORKS AND SO AS NOT TO INTERFERE IN ANY WAY WITH THE OPERATION OR MAINTENANCE OF THE STRUCTURE. STREAM DIVERSIONS SHALL BE MAINTAINED UNTIL THE FULL FLOW CAN BE PASSED THROUGH THE PERMANENT WORKS. THE REMOVAL OF WATER FROM THE REQUIRED EXCAVATIONS AND THE FOUNDATION SHALL BE ACCOMPLISHED IN A MANNER AND TO THE EXTENT THAT WILL MAINTAIN STABILITY OF THE EXCAVATED SLOPES AND BOTTOM OF REQUIRED EXCAVATIONS AND WILL ALLOW SATISFACTORY PERFORMANCE OF ALL CONSTRUCTION OPERATIONS. DURING THE PLACING AND COMPACTING OF MATERIAL IN REQUIRED EXCAVATIONS, THE WATER LEVEL AT THE LOCATIONS BEING REFILLED SHALL BE MAINTAINED BELOW THE BOTTOM OF THE EXCAVATION AT SUCH LOCATIONS WHICH MAY REQUIRE DRAINING THE WATER TO SUMPS FROM WHICH THE WATER SHALL BE PUMPED.

STABILIZATION

ALL BORROW AREAS SHALL BE GRADED TO PROVIDE PROPER DRAINAGE AND LEFT IN A SIGHTLY CONDITION. ALL EXPOSED SURFACES OF THE EMBANKMENT, SPILLWAY, SPOIL AND BORROW AREAS, AND BERMS SHALL BE STABILIZED BY SEEDING, LIMING, FERTILIZING AND MULCHING IN ACCORDANCE WITH MHDSS OR AS SHOWN ON THE ACCOMPANYING DRAWINGS.

EROSION AND SEDIMENT CONTROL

CONSTRUCTION OPERATIONS WILL BE CARRIED OUT IN SUCH A MANNER THAT EROSION WILL BE CONTROLLED AND WATER AND AIR POLLUTION MINIMIZED. STATE AND LOCAL LAWS CONCERNING POLLUTION ABATEMENT WILL BE FOLLOWED. DETAIL EROSION AND SEDIMENT CONTROL MEASURES TO BE EMPLOYED DURING THE CONSTRUCTION PROCESS SHALL BE IN ACCORDANCE WITH THE SEDIMENT EROSION CONTROL PLAN HEREIN AND GENERALLY ACCEPTED PRACTICES.

STORMWATER MANAGEMENT FACILITIES SHALL BE PROTECTED FROM SEDIMENT AND SILTATION AT ALL TIMES. JUST PRIOR TO COMPLETION, THE SITE SUBCONTRACTOR SHALL PERFORM A FINAL INSPECTION AND CLEANING OF THE STORM WATER MANAGEMENT SYSTEM. ALL SEDIMENT AND SILTATION SHALL BE REMOVED FROM THE BASINS, FOREBAYS, ETC. AND THESE AREAS SHALL BE SHAPED TO FINAL CONTOURS AND ELEVATION PER THE PLANS. ALL REPAIRS SHALL BE MADE AS NECESSARY TO THE SATISFACTION OF THE ENGINEER PRIOR TO PLACING FINAL TOPSOIL, MULCH, VEGETATION, SEEDING, ETC.

CORRUGATED METAL PIPE

ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR CORRUGATED METAL PIPE:

1. MATERIALS – (STEEL PIPE) – THIS PIPE AND ITS APPURTENANCES SHALL BE GALVANIZED AND FULLY BITUMINOUS COATED AND SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATION M-190 TYPE A WITH WATERTIGHT COUPLING BANDS. ANY BITUMINOUS COATING DAMAGED OR OTHERWISE REMOVED SHALL BE REPLACED WITH COLD APPLIED BITUMINOUS COATING COMPOUND. STEEL PIPES WITH POLYMERIC COATING SHALL HAVE A MINIMUM COATING THICKNESS OF 0.01 INCH (10 MIL) ON BOTH SIDES OF THE PIPE. THE FOLLOWING COATINGS OR AN APPROVED EQUAL MAY BE USED: NEXON, PLASTI-COTE, BLAC-KLAD, AND BETH-CU-LOY. COATED CORRUGATED STEEL PIPE SHALL MEET THE REQUIREMENTS OF AASHTO M-245 AND M-246.

MATERIALS – (ALUMINUM COATED STEEL PIPE) – THIS PIPE AND ITS APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATION M-274 WITH WATERTIGHT COUPLING BANDS OR FLANGES. ANY ALUMINUM COATING DAMAGED OR OTHERWISE REMOVED SHALL BE REPLACED WITH COLD APPLIED BITUMINOUS COATING COMPOUND.

MATERIALS – (ALUMINUM PIPE) – THIS PIPE AND ITS APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATION M-196 OR M-211 WITH WATERTIGHT COUPLING BANDS OR FLANGES. ALUMINUM SURFACES THAT ARE TO BE IN CONTACT WITH CONCRETE SHALL BE PAINTED WITH ONE COAT OF ZINC CHROMATE PRIMER. HOT DIP GALVANIZED BOLTS MAY BE USED FOR CONNECTIONS. THE PH OF THE SURROUNDING SOILS SHALL BE BETWEEN 4 AND 9.

2. COUPLING BANDS, ANTI-SEEP COLLARS, END SECTIONS, ETC., MUST BE COMPOSED OF THE SAME MATERIAL AS THE PIPE. METALS MUST BE INSULATED FROM DISSIMILAR MATERIALS WITH USE OF RUBBER OR PLASTIC INSULATING MATERIALS AT LEAST 24 MILS IN THICKNESS.

3. CONNECTIONS – ALL CONNECTIONS WITH PIPES MUST BE COMPLETELY WATERTIGHT. THE DRAIN PIPE OR BARREL CONNECTION TO THE RISER SHALL BE WELDED ALL AROUND WHEN THE PIPE AND RISER ARE METAL. ANTI-SEEP COLLARS SHALL BE CONNECTED TO THE PIPE IN SUCH A MANNER AS TO BE COMPLETELY WATERTIGHT. DIMPLE BANDS ARE NOT CONSIDERED TO BE WATERTIGHT.

ALL CONNECTIONS SHALL USE A RUBBER OR NEOPRENE GASKET WHEN JOINING PIPE SECTIONS. THE END OF EACH PIPE SHALL BE RE-ROLLED AN ADEQUATE NUMBER OF CORRUGATIONS TO ACCOMMODATE THE BAND WIDTH. THE FOLLOWING TYPE CONNECTIONS ARE ACCEPTABLE FOR PIPES LESS THAN 24" IN DIAMETER: FLANGES ON BOTH ENDS OF THE PIPE, A 12" WIDE STANDARD LAP TYPE BAND WITH 12" WIDE BY 3/8" THICK CLOSED CELL CIRCULAR NEOPRENE GASKET; AND A 12" WIDE HUGGER TYPE BAND WITH O-RING GASKETS HAVING A MINIMUM DIAMETER OF 1/2" GREATER THAN THE CORRUGATION DEPTH. PIPES 24" IN DIAMETER AND LARGER SHALL BE CONNECTED BY A 24" LONG ANNULAR CORRUGATED BAND USING RODS AND LUGS. A 12" WIDE BY 3/8" THICK CLOSED CELL CIRCULAR NEOPRENE GASKET WILL BE INSTALLED ON THE END OF EACH PIPE FOR A TOTAL OF 24".

HELICALLY CORRUGATED PIPE SHALL HAVE EITHER CONTINUOUSLY WELDED SEAMS OR HAVE LOCK SEAMS WITH INTERNAL CAULKING OR A NEOPRENE BEAD.

4. BEDDING – THE PIPE SHALL BE FIRMLY AND UNIFORMLY BEDDED THROUGHOUT ITS ENTIRE LENGTH. WHERE ROCK OF SOFT, SPONGY OR OTHER UNSTABLE SOIL IS ENCOUNTERED, ALL SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE EARTH COMPACTED TO PROVIDE ADEQUATE SUPPORT.

5. BACKFILL SHALL CONFORM TO STRUCTURE BACKFILL.

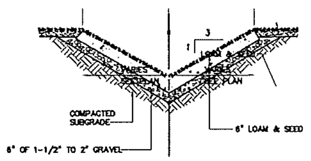
6. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

INSPECTIONS:

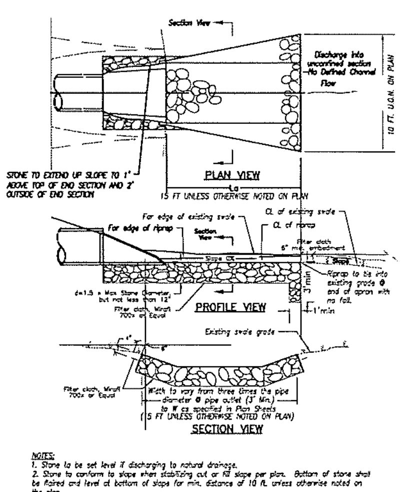
1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH THE ENGINEER ON ALL NECESSARY INSPECTIONS. THESE INSPECTIONS SHALL BE REVIEWED AT A PRE-CONSTRUCTION MEETING OR OTHER MEANS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 48 HOURS AHEAD OF REQUIRED INSPECTIONS.
2. AT A MINIMUM, THE FOLLOWING INSPECTIONS WILL BE REQUIRED:
   A. INSTALLATION OF SEDIMENT AND EROSION CONTROLS AT LIMIT OF WORK PRIOR TO COMMENCING CONSTRUCTION.
   B. BOTTOM OF EXCAVATION FOR EACH STORMWATER MANAGEMENT (SWM) FACILITY.
   C. AT COMPLETION OF INSTALLATION OF EACH SWM FACILITY PRIOR TO BACKFILL.
   D. DURING INSTALLATION OF THE BIO-INFILTRATION/RETENTION SECTIONS AS APPLICABLE.
   E. VERIFICATION OF FINAL TOPSOIL LAYER AND THICKNESS INSTALLED.
   NOTE: THE CONTRACTOR SHALL VERIFY/ENSURE FINAL ELEVATIONS AND PROVIDED VOLUMES ARE CORRECT AND IN ACCORDANCE WITH THE PLANS PRIOR TO FINE GRADING, INSTALLATION OF PLANTINGS AND STABILIZATION.
   F. FINAL STABILIZATION AND PLANTINGS PRIOR TO REMOVING ANY SEDIMENT AND EROSION CONTROL DEVICES.

AS-BUILTS:

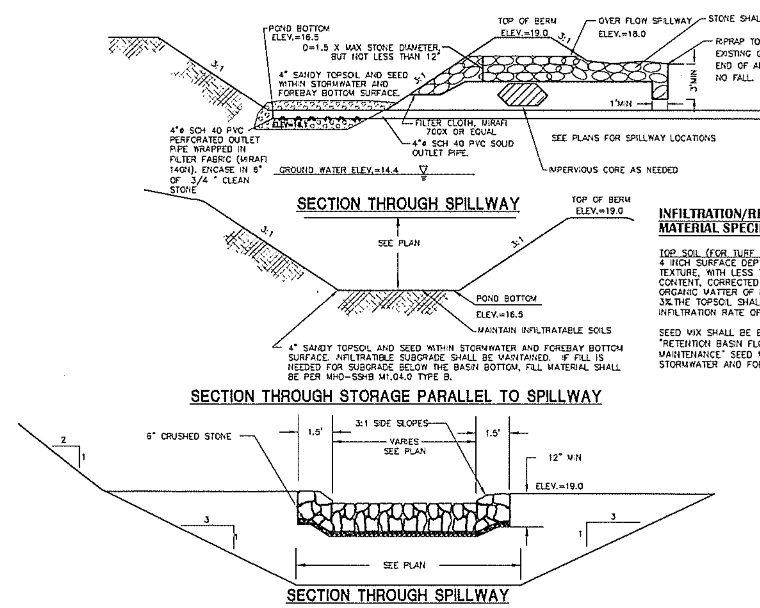
CONTRACTOR WILL CAUSE TO BE PREPARED AS-BUILT DRAWINGS OF THE SWM SYSTEM(S), STAMPED BY A MA LICENSED PROFESSIONAL ENGINEER (PE) CERTIFYING THAT "TO THE BEST OF THEIR KNOWLEDGE, JUDGMENT AND BELIEF, THE INSTALLED STORMWATER MANAGEMENT SYSTEM(S) MEET(S) THE DESIGN DETAILS, SPECIFICATIONS, VOLUMES AND DESIGN ELEVATIONS."



C- 134A GRASS SWALE N.T.S.
DETAIL



C- 613 RIP-RAP OULET PROTECTION I N.T.S.
DETAIL



INFILTRATION/RETENTION BASIN MATERIAL SPECIFICATIONS:

TOP SOIL (FOR TURF COVER)
4 INCH SURFACE DEPTH OF LOAMY SAND TEXTURE, WITH LESS THAN 5% CLAY CONTENT, CORRECTED PH 5.5-6.5, AND ORGANIC MATTER OF BETWEEN 1.5% TO 3%.THE TOPSOIL SHALL HAVE AN INFILTRATION RATE OF 2.5 IN/HR.

SEED MIX SHALL BE ERNST SEEDS "RETENTION BASIN FLOOR MIX – LOW MAINTENANCE" SEED MIX OR EQUAL WITHIN STORMWATER AND FOREBAY SURFACES.

C- 154 INFILTRATION POND SECTIONS N.T.S.
DETAIL

FOR PERMIT ONLY - NOT FOR CONSTRUCTION

BAXTER NYE
ENGINEERING & SURVEYING

BAXTER NYE ENGINEERING & SURVEYING

Registered Professional Engineers and Land Surveyors

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STAMP STAMP

CONSULTANT

CONSULTANT

PREPARED FOR:
SOUTHWORTH MASHPEE PROPERTIES, LLC
130 Willowbend Drive
Mashpee MA 02549

PROJECT TITLE
Willowbend Country Club
Clubhouse Villas

DATE DESCRIPTION

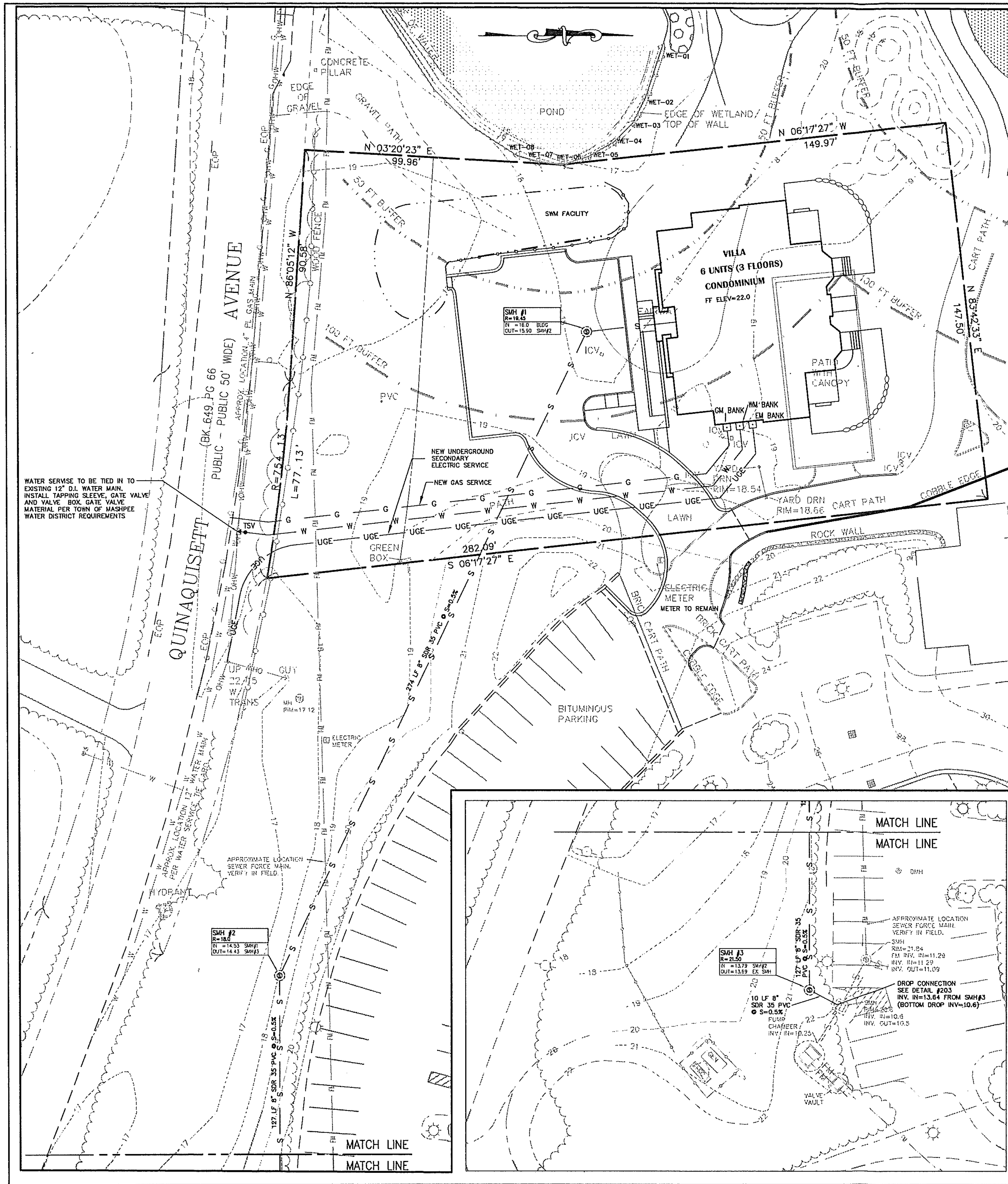
SHEET TITLE
Stormwater Management Details & Notes

SHEET NO
C4.1

DATE: APRIL 14, 2020

20 0 20 40
SCALE IN FEET
SCALE: 1"=20'

DRAWN BY: SDM CHECKED BY: MWE
JOB NO: 2014-009 FILE: 2014-009 CLUB RMS DM.dwg



UTILITY NOTES:

1. CAUTION: THE CONTRACTOR SHALL CONTACT DIG SAFE (AT 1-888-DIG-SAFE) AND UTILITY COMPANIES TO LOCATE ALL EXISTING UTILITIES, AT LEAST 72 HOURS PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION, BOTH HORIZONTALLY AND VERTICALLY, OF ALL EXISTING UTILITIES BEFORE THE START OF ANY WORK. THE LOCATION OF EXISTING UNDERGROUND SYSTEMS, INFRASTRUCTURE, UTILITIES, CONDUITS AND LINES ARE SHOWN IN AN APPROXIMATE WAY ONLY, MAY NOT BE LIMITED TO THOSE SHOWN HEREIN AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER, THE ENGINEER, OR ITS REPRESENTATIVE. THE CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO LOCATE SAID SYSTEMS, INFRASTRUCTURE AND UTILITIES EXACTLY. IF ELEVATION INFORMATION DIFFERS FROM PLAN INFORMATION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY FOR POSSIBLE REDESIGN. AT UTILITY CROSSINGS, VERIFY IN FIELD THE LOCATION AND INVERTS OF WATER, ELECTRIC, GAS, TELEPHONE & DATA/COMM AND RELOCATE IF CONFLICTING WITH PROPOSED INVERTS PER THE ENGINEERS DIRECTION. THE CONTRACTOR SHALL PRESERVE ALL UNDERGROUND SYSTEMS, INFRASTRUCTURE AND UTILITIES AS REQUIRED.

2. 12" MINIMUM VERTICAL CLEARANCE SHALL BE MAINTAINED BETWEEN ALL UTILITY CROSSINGS.

3. A MINIMUM 10' HORIZONTAL SEPARATION SHALL BE MAINTAINED BETWEEN WATER AND SEWER LINES. WHERE WATER LINES CROSS SEWER LINES, THE SEWER LINE SHALL BE LOCATED WITH A MINIMUM VERTICAL CLEARANCE OF 18" BELOW THE WATER LINE. THE SEWER LINE JOINTS SHALL BE LOCATED EQUIDISTANT AND AS FAR AWAY FROM THE WATER LINE AS POSSIBLE. WHEN IT IS IMPOSSIBLE TO ACHIEVE HORIZONTAL AND/OR VERTICAL SEPARATION AS STIPULATED ABOVE, BOTH THE WATER LINE AND SEWER LINE AT THE CROSSING LOCATION SHALL BE CONSTRUCTED OF MECHANICAL JOINT CEMENT-LINED DUCTILE IRON PIPE FOR ONE FULL 20' PIPE LENGTH OR ANOTHER EQUIVALENT THAT IS WATERTIGHT AND STRUCTURALLY SOUND. THE JOINTS FOR BOTH PIPES SHALL BE LOCATED AS FAR AWAY FROM THE CROSSING AS POSSIBLE. BOTH PIPES SHOULD BE PRESSURE TESTED TO 150 PSI TO ENSURE THAT THEY ARE WATERTIGHT.

4. SEWER MAINS TO BE 8" MIN. SDR-35 PVC WITH A MIN. SLOPE OF 0.50% UNLESS OTHERWISE NOTED. SEWER MAINS AND SEWER FORCE MAINS TYPICAL COVER OVER SEWER LINE SHALL BE 6'. IF LESS THAN 4' OF COVER IS PROVIDED, INSULATE SEWER LINE AGAINST FREEZING IN ACCORDANCE WITH DETAIL #205 OR EQUAL.

5. SEWER BUILDING CONNECTIONS SHALL BE 4" MIN. SCHEDULE 40 PVC, U.O.N., AT A MIN. SLOPE OF 1.0% U.O.N. A CLEANOUT SHALL BE SET ON EACH SERVICE LINE AT A DISTANCE OF 10' +/- (U.O.N.) OFF THE FOUNDATION. ALL PIPING FOR COMMERCIAL BUILDINGS SHALL BE PER PLUMBING CODE WITHIN 10 FEET OF BUILDING.

6. WATER MAINS TO BE CEMENT LINED DUCTILE IRON PIPE CLASS 52, U.O.N. ALL CONSTRUCTION METHODS AND MATERIALS SHALL BE AS REQUIRED BY, AND IN ACCORDANCE WITH THE LOCAL WATER DEPARTMENT AND APPLICABLE AWWA SPECIFICATIONS.

7. TYPICAL COVER OVER WATER LINE SHALL BE 5'. IF LESS THAN 4' OF COVER IS PROVIDED, INSULATE WATER LINE AGAINST FREEZING IN ACCORDANCE WITH DETAIL #205 OR EQUAL.

8. WATERLINE INSTALLATION REQUIRES THRUST BLOCKS TO BE INSTALLED AT ALL BENDS, ENDS OF LINE, VALVES AND FIRE HYDRANTS IN ACCORDANCE DETAIL #301.

9. AUTOMATIC SPRINKLERS SHALL BE INSTALLED IN ACCORDANCE WITH MASSACHUSETTS BUILDING CODE AND APPLICABLE NFPA REGULATIONS, IF SO REQUIRED.

10. ELECTRIC, DATA/COM IS SHOWN SCHEMATICALLY HEREON. ALL LABOR, WORK, EQUIPMENT AND MATERIALS FOR INSTALLATION OF THESE UTILITIES SHALL BE OWNED AND PERFORMED BY THE CONTRACTOR. UTILITIES SHALL BE INSTALLED WITH A MINIMUM COVER OF 3 FEET U.O.N. OR OTHERWISE DIRECTED BY THE CONTROLLING UTILITY COMPANY. CONTRACTOR SHALL COORDINATE ALL FINAL LAYOUTS AND DETAILS WITH APPLICABLE UTILITY COMPANY.

11. EXTERIOR RESIDENTIAL LIGHTING SHALL BE LOW WATTAGE TYPE AND DIRECTED SO AS TO KEEP ALL LIGHTING WITHIN SUBJECT LOT. ANY SITE LIGHTING USED SHALL BE LOW WATTAGE STREET LANTERNS ON 15' MAXIMUM POLE LOCATED ADJACENT TO SUBJECT LOT DRIVEWAY, PARKING OR WALKWAYS.

12. ALL UTILITY CUTS THROUGH EXISTING CONCRETE OR BITUMINOUS CONCRETE PAVED SURFACES SHALL BE SAW CUT. BACK FILLING OF TRENCH SHALL INCLUDE 12" IN DEPTH FLOWABLE FILL TO THE BASE COURSE OF THE SURFACE TREATMENT. THE SURFACE TREATMENT SHALL THEN BE REPLACED IN KIND. IF THE BITUMINOUS CONCRETE SURFACE IS WITHIN THE ROADWAY, THE BITUMINOUS CONCRETE TOP COURSE SHALL BE FINISHED WITH INFRARED TREATMENT TO BLEND EXISTING AND NEWLY PAVED SURFACES, IF REQUIRED BY THE MUNICIPALITY.

13. SITE CONTRACTOR TO OWN ALL EXCAVATION, TRENCHING, & BACKFILLING FOR ALL UTILITIES AND MISCELLANEOUS WORK INCIDENTAL TO THE SCOPE OF THE PROJECT AND CONTRACT DOCUMENTS. CONTRACTOR SHALL REFER TO MEP AND LANDSCAPE PLANS BY OTHERS FOR ADDITIONAL INFORMATION AS APPLICABLE.

14. ALL WORK WITHIN THESE PLANS SHALL BE PERFORMED AND PROVIDED BY THE CONTRACTOR IN ACCORDANCE WITH THE CONSTRUCTION DETAILS PROVIDED IN THIS PLAN SET WHETHER OR NOT THE DETAIL NUMBER IS SPECIFICALLY REFERENCED.

15. ALL COVERS, CURB BOXES, GRATES, AND OTHER FINISH SURFACES SHALL BE RESET TO THE NEW FINISH GRADE.

16. THE FIRST 10 FEET FROM THE BUILDING FACE FOR STORM DRAIN, SEWER AND WATER PIPING SHALL FOLLOW THE PLUMBING CODE. THIS INCLUDES THE FIRST 10 FT OF STORM DRAIN AND SEWER PIPE TO BE CAST IRON MATERIAL. REFER TO PLUMBING PLANS BY OTHERS AS APPLICABLE.

17. WHERE UTILITIES CALLED OUT TO BE ABANDONED IN PLACE OR REMOVED AS NEEDED CONTRACTOR SHALL OWN REMOVING PIPE AND APPURTENANCES AS NEEDED WHERE THEY CONFLICT WITH PROPOSED WORK.

SEWER TESTING NOTES:

GRAVITY AND FORCEMAIN PIPING

1. PIPING PREPARATION

A. LAMPING:

1. LAMP GRAVITY PIPING AFTER FLUSHING AND CLEANING.
2. PERFORM LAMPING OPERATION BY SHINING LIGHT AT ONE END OF EACH PIPE SECTION BETWEEN MANHOLES; OBSERVE LIGHT AT OTHER END; REJECT PIPE NOT INSTALLED WITH UNIFORM LINE AND GRADE; REMOVE AND REINSTALL REJECTED PIPE SECTIONS; RE-CLEAN AND LAMP UNTIL PIPE SECTION ACHIEVES UNIFORM LINE AND GRADE.

2. PERFORMANCE

A. GENERAL:

1. ALL SEWERS AND APPURTENANT WORK, IN ORDER TO BE ELIGIBLE FOR ACCEPTANCE BY THE ENGINEER, SHALL BE SUBJECTED TO TESTS THAT WILL DETERMINE THE DEGREE OF WATER TIGHTNESS AND HORIZONTAL AND VERTICAL ALIGNMENT.
2. THOROUGHLY CLEAN AND/OR FLUSH ALL SEWER LINES TO BE TESTED, IN A MANNER AND TO THE EXTENT ACCEPTABLE TO THE ENGINEER, PRIOR TO INITIATING TEST PROCEDURES.
3. PERFORM ALL TESTS AND INSPECTIONS IN THE PRESENCE OF THE ENGINEER AND THE PLUMBING OR BUILDING INSPECTOR OR OTHER TOWN OFFICIAL IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AND STATE CODES.
4. PERFORM TESTING BY TEST PATTERNS DETERMINED BY OR ACCEPTABLE TO THE ENGINEER.
5. REMEDIAL WORK:
   a. PERFORM ALL WORK NECESSARY TO CORRECT DEFICIENCIES DISCOVERED AS A RESULT OF TESTING AND/OR INSPECTIONS.
   b. COMPLETELY RETEST ALL PORTIONS OF THE ORIGINAL CONSTRUCTION ON WHICH REMEDIAL WORK HAS BEEN PERFORMED.
   c. PERFORM ALL REMEDIAL WORK AND RETESTING IN A MANNER AND AT A TIME ACCEPTABLE TO THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER.

B. TESTING GRAVITY SEWER PIPING:

1. LOW-PRESSURE AIR TEST:
   a. TEST EACH SECTION OF GRAVITY SEWER PIPING.
   b. INTRODUCE AIR PRESSURE SLOWLY TO APPROXIMATELY 4 PSIG.
      1) DETERMINE GROUND WATER ELEVATION ABOVE SPRING LINE OF PIPE AND FOR EVERY FOOT OF GROUND WATER ABOVE SPRING LINE OF PIPE, INCREASE STARTING AIR TEST PRESSURE BY 0.43 PSIG; DO NOT INCREASE PRESSURE ABOVE 10 PSIG.
   c. ALLOW PRESSURE TO STABILIZE FOR AT LEAST FIVE MINUTES. ADJUST PRESSURE TO 3.5 PSIG OR INCREASED TEST PRESSURE AS DETERMINED ABOVE WHEN GROUND WATER IS PRESENT. START TEST.
   d. TEST:
      1) DETERMINE TEST DURATION FOR SEWER SECTION WITH SINGLE PIPE SIZE FROM THE FOLLOWING TABLE. DO NOT MAKE ALLOWANCE FOR LATERALS.

         NOMINAL PIPE SIZE (INCHES) = MINIMUM TEST TIME (MIN/ 100 FEET)

         3" = 0.2; 4" = 0.3; 6" = 0.7; 8" = 1.2; 10"=1.5; 12"=1.8; 15"=2.1; 18"=2.4; 21"=3.0; 24"=3.6; 27"=4.2; 30"=4.8; 33"=5.4; 36"=6.0

      2) RECORD DROP IN PRESSURE DURING TEST PERIOD; WHEN AIR PRESSURE HAS DROPPED MORE THAN 1.0 PSIG DURING TEST PERIOD, PIPING HAS FAILED; WHEN 1.0 PSIG AIR PRESSURE DROP HAS NOT OCCURRED DURING TEST PERIOD, DISCONTINUE TEST AND PIPING IS ACCEPTED.
      3) WHEN PIPING FAILS, DETERMINE SOURCE OF AIR LEAKAGE, MAKE CORRECTIONS AND RETEST; TEST SECTION IN INCREMENTAL STAGES UNTIL LEAKS ARE ISOLATED; AFTER LEAKS ARE REPAIRED, RETEST ENTIRE SECTION BETWEEN MANHOLES.
2. TEST PIPE LARGER THAN 36 INCHES DIAMETER WITH EXFILTRATION TEST NOT EXCEEDING 100 GALLONS FOR EACH INCH OF PIPE DIAMETER FOR EACH MILE PER DAY FOR EACH SECTION UNDER TEST. PERFORM TEST WITH MINIMUM POSITIVE HEAD OF 2 FEET.
3. INFILTRATION TEST:
   a. USE ONLY WHEN GRAVITY PIPING IS SUBMERGED IN GROUND WATER MINIMUM OF 4 FEET ABOVE CROWN OF PIPE FOR ENTIRE LENGTH BEING TESTED.
   b. MAXIMUM ALLOWABLE INFILTRATION: 100 GALLONS PER INCH OF PIPE DIAMETER FOR EACH MILE PER DAY FOR SECTION UNDER TEST, INCLUDE ALLOWANCES FOR LEAKAGE FROM MANHOLES. PERFORM TEST WITH MINIMUM POSITIVE HEAD OF 2 FEET.

C. TESTING PRESSURE SEWER PIPING:

1. HYDROSTATIC LEAKAGE TEST:
   a. HYDROSTATICALLY TEST EACH PORTION OF PRESSURE PIPING, INCLUDING VALVED SECTIONS, AT 1.5 TIMES WORKING PRESSURE OF PIPING BASED ON ELEVATION OF LOWEST POINT IN PIPING CORRECTED TO ELEVATION OF TEST GAUGE.
   b. FILL SECTION TO BE TESTED WITH WATER SLOWLY, EXPEL AIR FROM PIPING AT HIGH POINTS. INSTALL CORPORATION COCKS AT HIGH POINTS. CLOSE AIR VENTS AND CORPORATION COCKS AFTER AIR IS EXPELLED AND RAISE PRESSURE TO SPECIFIED TEST PRESSURE.
   c. OBSERVE JOINTS, FITTINGS AND VALVES UNDER TEST. REMOVE AND RENEW CRACKED PIPE, JOINTS, FITTINGS, AND VALVES SHOWING VISIBLE LEAKAGE. RETEST.
   d. CORRECT VISIBLE DEFICIENCIES AND CONTINUE TESTING AT SAME TEST PRESSURE FOR ADDITIONAL 2 HOURS TO DETERMINE LEAKAGE RATE. MAINTAIN PRESSURE WITHIN PLUS OR MINUS 5.0 PSIG OF TEST PRESSURE. LEAKAGE IS DEFINED AS QUANTITY OF WATER SUPPLIED TO PIPING NECESSARY TO MAINTAIN TEST PRESSURE DURING PERIOD OF TEST.
   e. COMPUTE MAXIMUM ALLOWABLE LEAKAGE BY THE FOLLOWING FORMULA:

      $L = (S \times D \times \sqrt{P}) + C$

      L = ALLOWABLE LEAKAGE, IN GALLONS PER HOUR
      S = LENGTH OF PIPE TESTED, IN FEET
      D = NOMINAL DIAMETER OF PIPE, IN INCHES
      P = AVERAGE TEST PRESSURE DURING LEAKAGE TEST, IN PSIG
      C = 133,200

      WHEN PIPE UNDER TEST CONTAINS SECTIONS OF VARIOUS DIAMETERS, CALCULATE ALLOWABLE LEAKAGE FROM SUM OF COMPUTED LEAKAGE FOR EACH SIZE.

   f. WHEN TEST OF PIPE INDICATES LEAKAGE GREATER THAN ALLOWED, LOCATE SOURCE OF LEAKAGE, MAKE CORRECTIONS AND RETEST UNTIL LEAKAGE IS WITHIN ALLOWABLE LIMITS. CORRECT VISIBLE LEAKS REGARDLESS OF QUANTITY OF LEAKAGE.

D. DEFLECTION TESTING OF PLASTIC SEWER PIPE:

1. PERFORM VERTICAL RING DEFLECTION TESTING ON PVC AND ABS SEWER PIPING, AFTER BACKFILLING HAS BEEN IN PLACE FOR AT LEAST 30 DAYS BUT NOT LONGER THAN 12 MONTHS.
2. ALLOWABLE MAXIMUM DEFLECTION FOR INSTALLED PLASTIC SEWER PIPE LIMITED TO 5 PERCENT OF ORIGINAL VERTICAL INTERNAL DIAMETER.
3. PERFORM DEFLECTION TESTING USING PROPERLY SIZED RIGID BALL OR 'GO, NO-GO' MANDREL.
4. FURNISH RIGID BALL OR MANDREL WITH DIAMETER NOT LESS THAN 95 PERCENT OF BASE OR AVERAGE INSIDE DIAMETER OF PIPE AS DETERMINED BY ASTM STANDARD TO WHICH PIPE IS MANUFACTURED. MEASURE PIPE IN COMPLIANCE WITH ASTM D2122.
5. PERFORM TEST WITHOUT MECHANICAL PULLING DEVICES.
6. LOCATE, EXCAVATE, REPLACE AND RETEST PIPE EXCEEDING ALLOWABLE DEFLECTION.

E. TELEVISION INSPECTION TESTS (GRAVITY SEWERS):

1. NO STANDING WATER SHALL BE ALLOWED. THE PRESENCE OF STANDING WATER MAY BE CAUSE FOR REJECTION OF THAT PIPE.
2. ANY STANDING WATER, DETECTABLE LEAKS, IMPROPER JOINTS OR ANY OTHER UNACCEPTABLE FEATURE DETECTED BY THE TELEVISION INSPECTION WILL BE CORRECTED BY RE-EXCAVATION AND RESETTING PIPE AT NO ADDITIONAL COST TO THE OWNER.

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PREPARED FOR:
SOUTHWORTH MASHPEE PROPERTIES, LLC
130 Willowbend Drive
Mashpee MA 02549

PROJECT TITLE
Willowbend Country Club
Clubhouse Villas

		DATE	DESCRIPTION

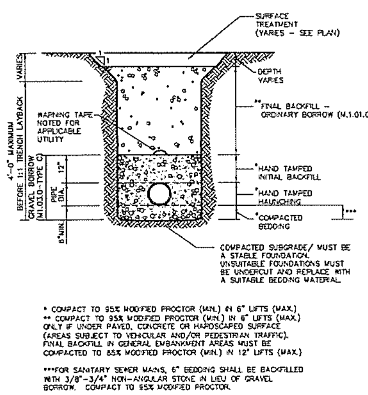
SHEET TITLE
Utility Plan and Notes

SHEET NO
C5.0

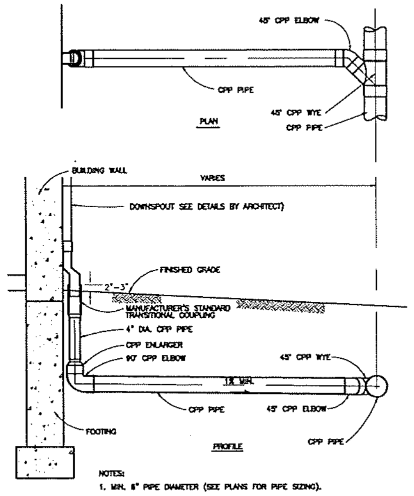
DATE: APRIL 14, 2020

20 0 20 40
SCALE IN FEET
SCALE: 1"=20'

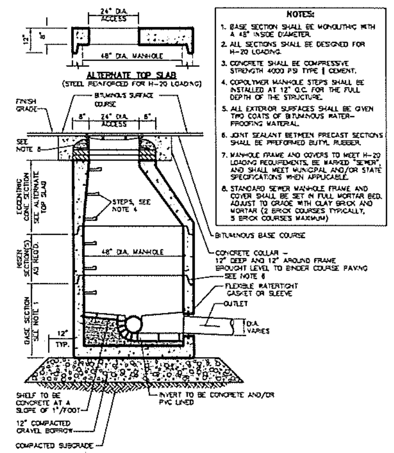
DRAWN BY: SDM CHECKED BY: MWE
JOB NO: 2014-009 FILE: 2014-009 CLUB RMS UT.dwg



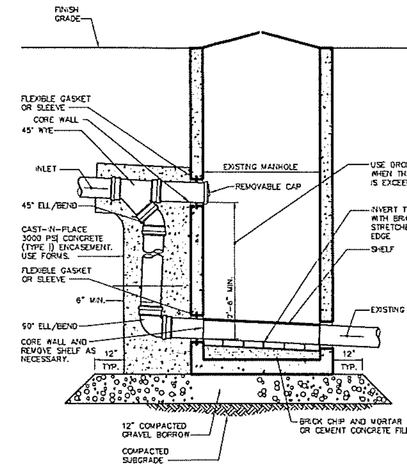
C- 118 UTILITY TRENCH N.T.S. DETAIL



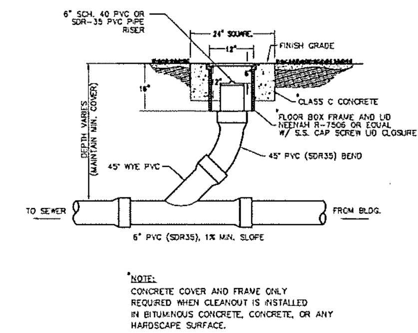
C- 132 ROOF DRAIN N.T.S. DETAIL



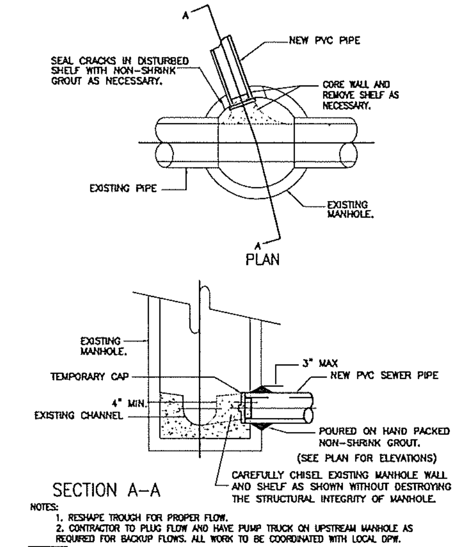
C- 201-A SANITARY SEWER MANHOLE (SMH) N.T.S. DETAIL



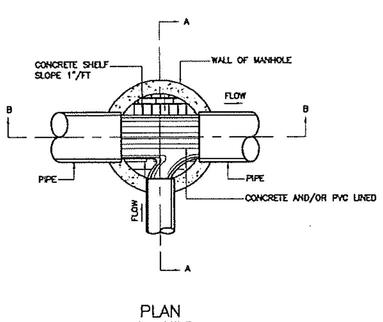
C- 203 DROP SEWER MANHOLE CONNECTION N.T.S. DETAIL



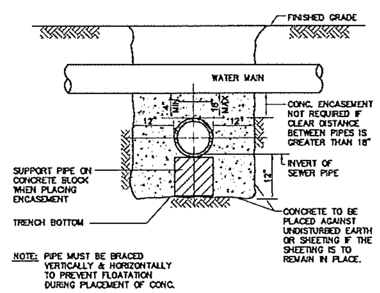
C- 204 SEWER SERVICE CLEAN-OUT N.T.S. DETAIL



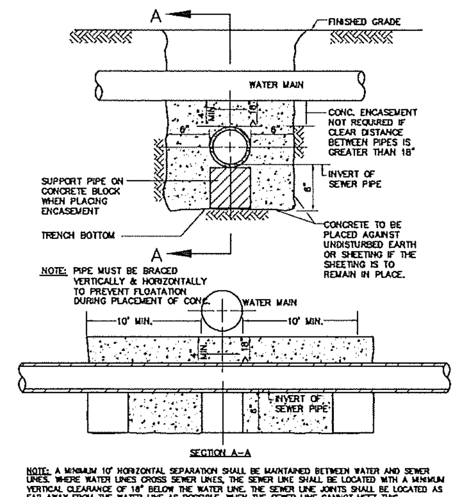
C- 229 CONNECTION TO EXISTING MANHOLE N.T.S. DETAIL



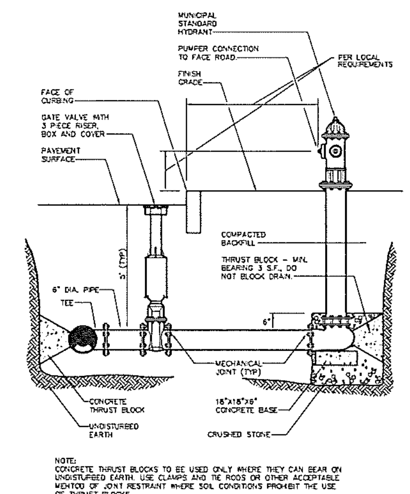
C- 230 SEWER MANHOLE CHANNEL N.T.S. DETAIL



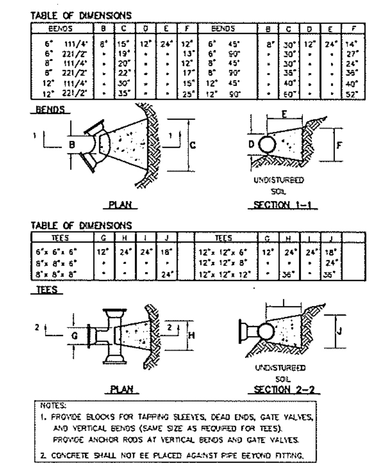
C- 232 CONCRETE ENCASEMENT AT UTILITY CROSSING N.T.S. DETAIL



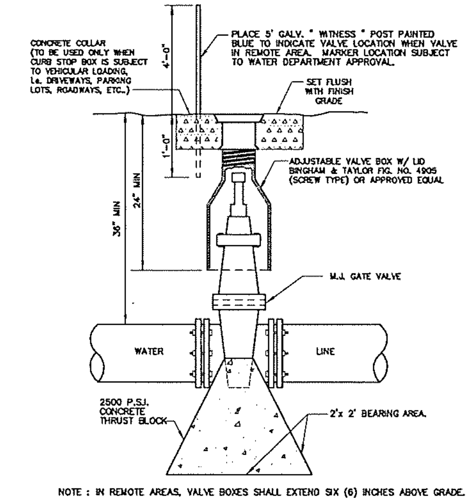
C- 232-A CONCRETE ENCASEMENT AT WATER MAIN CROSSING N.T.S. DETAIL



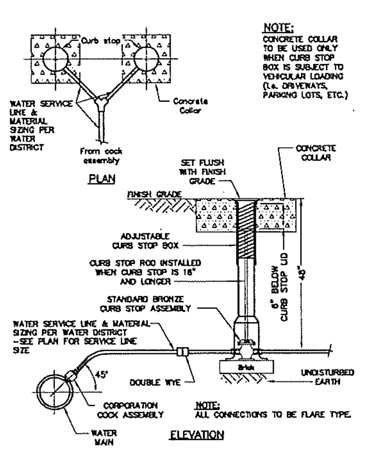
C- 300 FIRE HYDRANT CONNECTION N.T.S. DETAIL



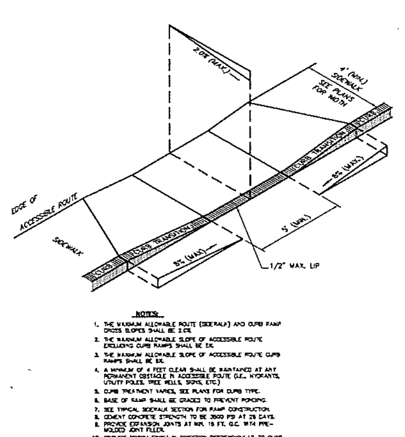
C- 301 CONCRETE THRUST BLOCK N.T.S. DETAIL



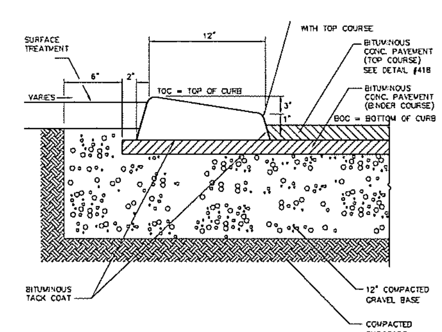
C- 310 GATE VALVE N.T.S. DETAIL



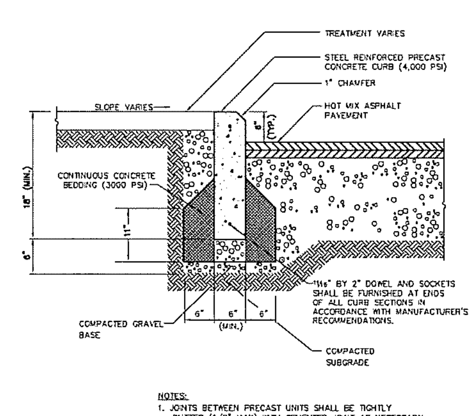
C- 314 TWIN WATER SERVICE CONNECTION N.T.S. DETAIL



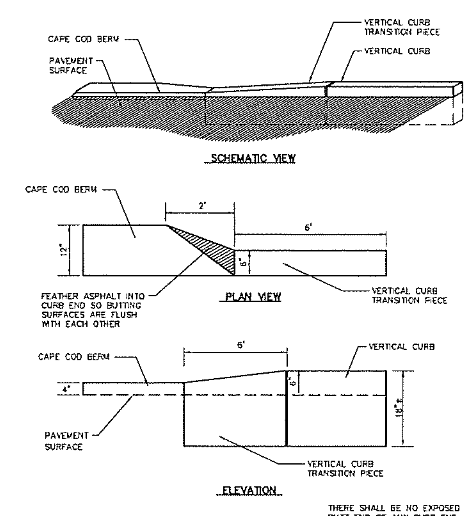
C- 402 ACCESSIBLE CURB RAMP - TYPE 'A' N.T.S. DETAIL



C- 411 CAPE COD BERM (CCB) N.T.S. DETAIL



C- 412 PRECAST CONRETE CURB (PCC) N.T.S. DETAIL



C- 414-A VERTICAL CURB TO BERM TRANSITION N.T.S. DETAIL

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CONSULTANT

CONSULTANT

PREPARED FOR:
SOUTHWORTH MASHPEE PROPERTIES, LLC
130 Willowbend Drive
Mashpee MA 02549

PROJECT TITLE
Willowbend Country Club
Clubhouse Villas

DATE DESCRIPTION

SHEET TITLE
Detail Sheet

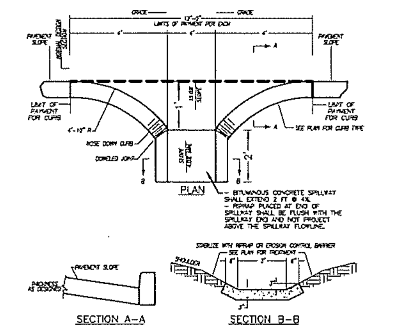
SHEET NO
C6.0

DATE: APRIL 14, 2020

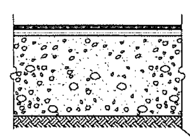
SCALE: NTS

DRAWN BY: SDM CHECKED BY: MWE

JOB NO: 2014-009 FILE: 2014-009-CLUB RMS DT.dwg



C- 415 STANDARD CURB OPENING AND SPILLWAY — N.T.S.
DETAIL



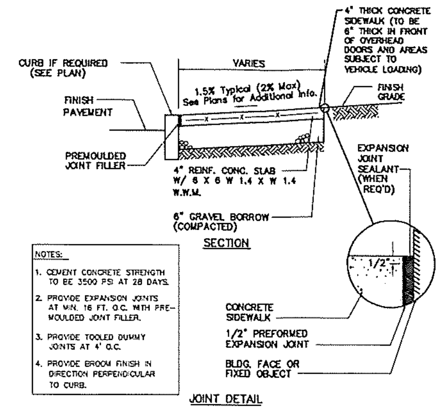
COMPOSITION AND COMPACTION ACCEPTANCE TESTS

1. OBTAIN SAMPLES FROM PLANT TO INDICATE CONFORMANCE WITH M3.11.09
2. PAVEMENT DENSITY AS OUTLINED IN M3.11.09
3. ALL SAMPLES TO BE TAKEN IN ACCORDANCE WITH AASHTO T230
4. MATERIALS SHALL MEET OR ACCEED THE REQUIREMENTS SPECIFIED IN SECTION M3.11.00 DIVISION III , MATERIALS AND THE FOLLOWING SUBSECTIONS

MINERAL AGGREGATE :M3.11.04	BITUMINOUS MATERIALS :M3.11.06
MINERAL FILLER :M3.11.05	COMPOSITION OF BASE COURSE :M3.11.02

5. THE BITUMINOUS CONCRETE BASE COURSE SHALL BE CONSTRUCTED IN ACCORDANCE WITH RELEVANT SECTIONS/PROVISIONS OF SECTION 460 FOR CLASS I BITUMINOUS CONCRETE PAVEMENT, TYPE I-1
6. CLASS I BITUMINOUS PAVEMENT ,TYPE I-1 REQUIRED THE SAME TESTING AS BASE COURSE AND SHALL HAVE A MINIMUM OF 95% COMPACTION. TESTING TO BE COMPLETED BY METHODS OUTLINED IN M3.11.00

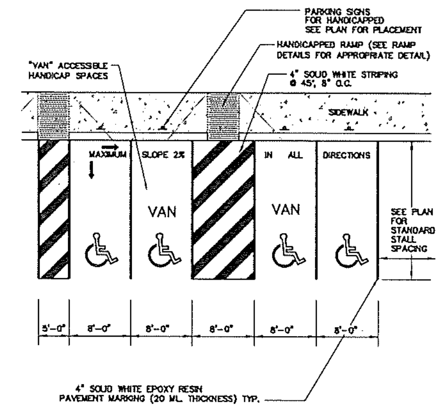
C- 418 BITUMINOUS CONCRETE PAVEMENT SECTIONS — N.T.S.
DETAIL



NOTES:

1. CEMENT CONCRETE STRENGTH TO BE 3500 PSI AT 28 DAYS.
2. PROVIDE EXPANSION JOINTS AT MIN. 16 FT. O.C. WITH PRE-MOULDED JOINT FILLER.
3. PROVIDE TOOLED DUMMY JOINTS AT 4' O.C.
4. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.

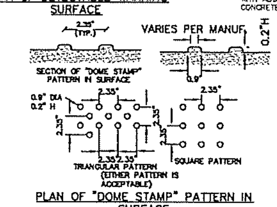
C- 420 CONCRETE SIDEWALK — N.T.S.
DETAIL



C- 440 HANDICAP PARKING AND STANDARD STALL LAYOUT — N.T.S.
DETAIL

NOTE: ACCESSIBLE RAMPS AND CURB RAMPS WHERE POURING OF A SEPARATE INTEGRAL COLORED CONCRETE IS REQUIRED, INSTALL SHEAR DOWELS 2'-0" O.C. AND KEYWAYS TO PREVENT HEAVING OF RAMPS WITH ADJACENT SIDEWALK OR CONCRETE SURFACE.

PLAN OF DETECTABLE WARNING SURFACE



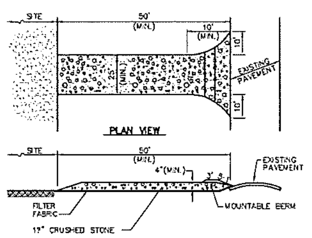
PLAN OF "DOME STAMP" PATTERN IN SURFACE

ALL DETECTABLE WARNING AREAS OF THE RAMP ARE TO HAVE AN INTEGRAL GRAY COLOR OR AS OTHERWISE REQUIRED BY THE TOWN OF BARNSTABLE

CURB RAMPS MUST HAVE DETECTABLE WARNING FEATURE EXTENDING THE FULL WIDTH AND DEPTH OF THE RAMP (MID-WALK "IN-LINE" RAMPS ONLY NEED DETECTABLE WARNINGS AT WALK/PARKING TRANSITION). THE DETECTABLE SURFACE MUST CONSIST OF RAISED TRUNCATED DOMES WITH THE DIAMETER OF NOMINAL 0.9 INCHES, A HEIGHT ON NOMINAL 0.2 INCHES AND A CENTER-TO CENTER SPACING OF NOMINAL 2.35 INCHES. THE TEXTURE OF THE DETECTABLE WARNING FEATURE MUST CONTRAST WITH THE SURROUNDING SURFACES (EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT). SEE ABOVE.

ACCEPTABLE COMPOSITE TACTILE WARNING SURFACE:
- ADA SOLUTIONS, INC. - BILLERICA, MASS. OR EQUAL

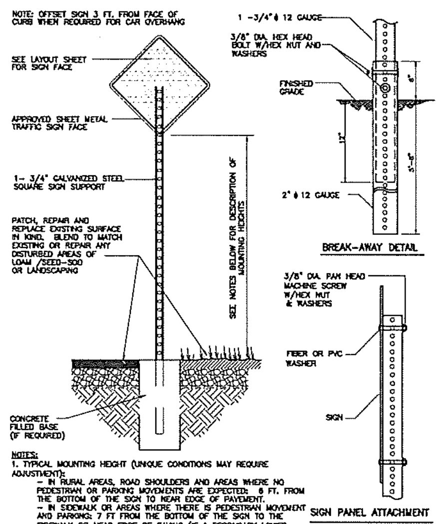
C- 433 TACTILE WARNING — N.T.S.
DETAIL



NOTES:

1. ENTRANCE WIDTH SHALL BE A TWENTY-FIVE (25) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
2. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY. BERM SHALL BE PERMITTED. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.

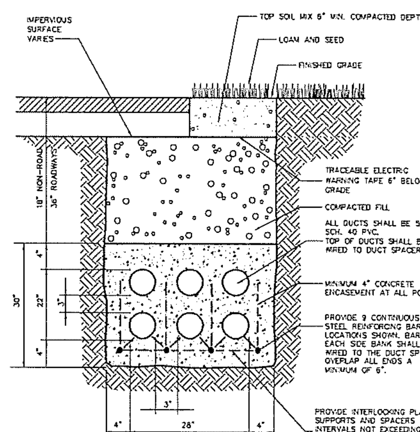
C- 609 STABILIZED CONSTRUCTION EXIT — N.T.S.
DETAIL



NOTES:

1. TYPICAL MOUNTING HEIGHT (UNIQUE CONDITIONS MAY REQUIRE ADJUSTMENT):
   - IN RURAL AREAS, ROAD SHOULDERS AND AREAS WHERE NO PEDESTRIAN OR PARKING MOVEMENTS ARE EXPECTED: 8 FT. FROM THE BOTTOM OF THE SIGN TO NEAR EDGE OF PAVEMENT.
   - IN SIDEWALK OR AREAS WHERE THERE IS PEDESTRIAN MOVEMENT AND PARKING: 7 FT FROM THE BOTTOM OF THE SIGN TO THE SIDEWALK OR NEAR EDGE OF PAVING (IF A SECONDARY LOWER SIGN IS MOUNTED, IT SHALL NOT PROJECT MORE THAN 4 INCHES INTO THE PEDESTRIAN FACILITY.)
   - HANDICAP PARKING SIGNS: 6 FT. TO THE BOTTOM OF THE SIGN (NOT TO EXCEED 8 FT TO THE TOP OF THE SIGN)

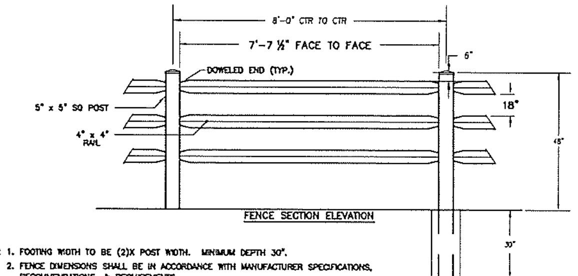
C- 715 TRAFFIC SIGN POST — N.T.S.
DETAIL



NOTES:

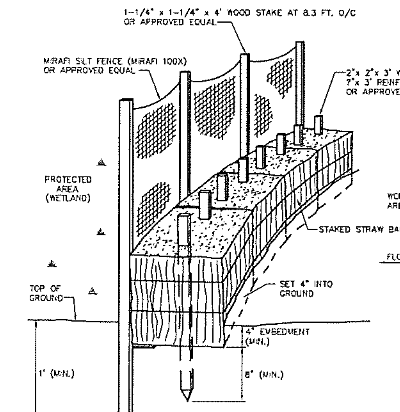
1. 4000 PSI CONCRETE FILL AROUND DUCTS.
2. CONCRETE MAY BE POURED DIRECTLY INTO OPEN TRENCH WITHOUT FORMWORK.
3. DUCT SPACERS TO BE USED AT 5'-0" CENTERS. BETWEEN DUCTS.

C- 832 UTILITY DUCT BANK — N.T.S.
DETAIL

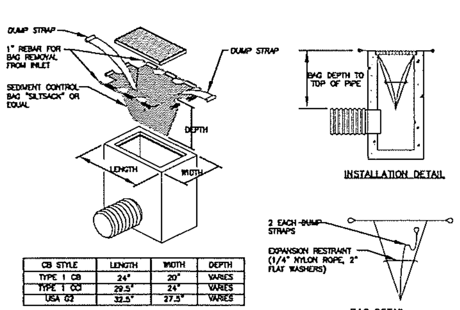


NOTES:
1. FOOTING WIDTH TO BE (2)X POST WIDTH. MINIMUM DEPTH 30".
2. FENCE DIMENSIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS, RECOMMENDATIONS, & REQUIREMENTS.
3. ALL MATERIALS TO BE CEDAR UNLESS OTHERWISE RECOMMENDED BY MANUFACTURER OR SUPPLIER.

C- 931-A 3-RAIL SPLIT RAIL CEDAR FENCE — N.T.S.
DETAIL



C- 601 SILT FENCE / STRAW BALE BARRIER — N.T.S.
DETAIL



CB STYLE	LENGTH	WIDTH	DEPTH
TYPE 1 CB	24"	20"	VARIES
TYPE 1 CCI	29.5"	24"	VARIES
USA G2	32.5"	27.5"	VARIES

INLET SEDIMENT CONTROL DEVICE - SILT SACK

NOTES:

THE DIMENSION CHART ABOVE IS FOR STANDARD CATCH BASINS AND INLETS ONLY. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE CORRECT SIZE DEVICE FOR EACH INLET.

FOR NON-STANDARD CATCH BASINS AND INLETS, THE CONTRACTOR SHALL MEASURE DIMENSIONS IN THE FIELD AND ORDER THE APPROPRIATE SIZE(S).

THE INLET SEDIMENT CONTROL DEVICE SHALL BE OF HIGH FLOW DESIGN (200 GAL/MIN/FT), AS PER THE MANUFACTURER'S SPECS.

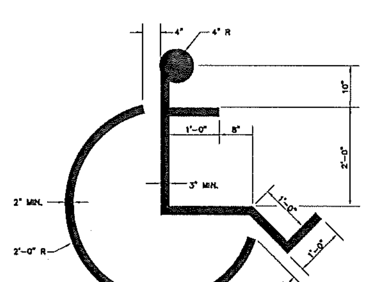
THE SEDIMENT CONTROL DEVICE SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED A MINIMUM ONCE PER MONTH OR WITHIN THE 48 HOURS FOLLOWING A STORM EVENT. FILTER SHALL BE CLEANED IN A MANNER WHICH ENSURES THAT ALL SEDIMENT REMAINS ON SITE.

SUBSTITUTION OF A SHEET OF FILTER FABRIC PLACED OVER THE OPENING OF THE INLET IS NOT APPROVED.

RECESSED CURB INLET CATCH BASINS MUST BE BLOCKED WHEN USING FILTER FABRIC INLET SACKS, SIZE OF FILTER INLET SACK TO BE DETERMINED BY MANUFACTURER.

THE FILTER SHALL BE REPLACED OR CLEANED WHEN THE BAG BECOMES HALF FULL.

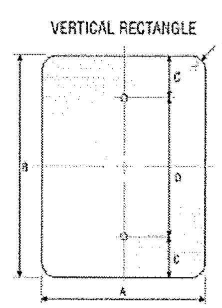
C- 628 SILT SACK — N.T.S.
DETAIL



NOTE: SYMBOL SHALL BE CENTERED IN THE PARKING STALL.

C- 703 HANDICAPPED PARKING STALL SYMBOL — N.T.S.
DETAIL

VERTICAL RECTANGLE



SIGN	A	B	C	D	E
12"X18"	12"	18"	1.5"	1.5"	1.5"

C- 727 ACCESSIBLE PARKING SIGN — N.T.S.
DETAIL

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CONSULTANT

CONSULTANT

PREPARED FOR:
SOUTHWORTH MASHPEE PROPERTIES, LLC
130 Willowbend Drive
Mashpee MA 02549

PROJECT TITLE
Willowbend Country Club
Clubhouse Villas

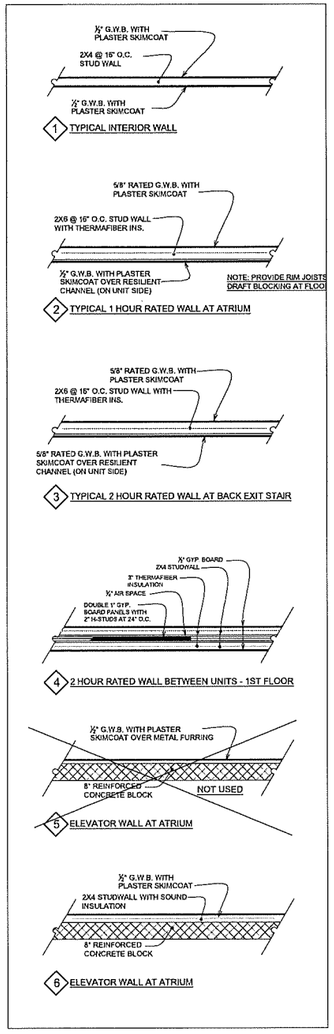
DATE	DESCRIPTION

SHEET TITLE
Detail Sheet

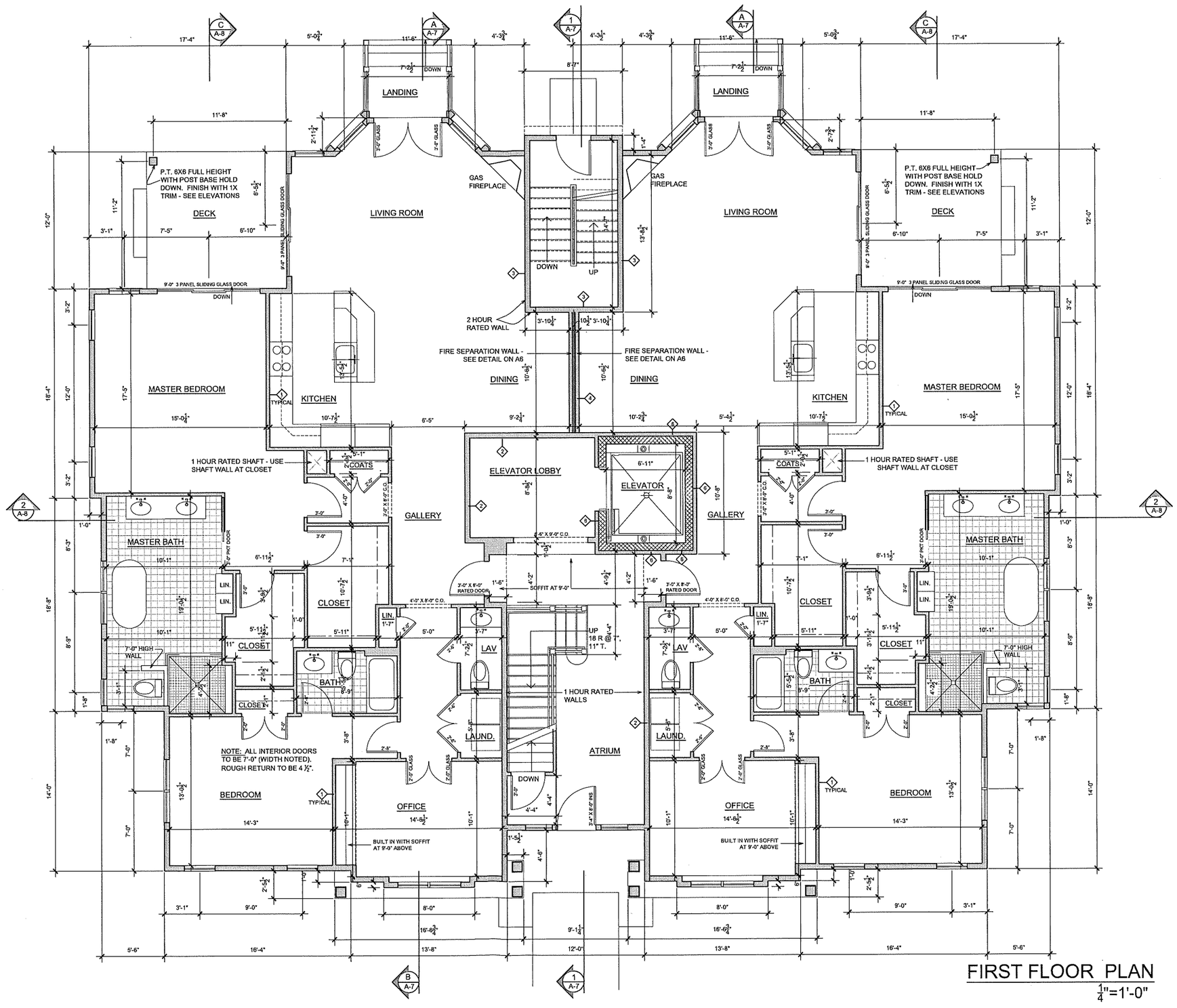
SHEET NO
C6.1

DATE: APRIL 14, 2020

SCALE: NTS
DRAWN BY: SDM — CHECKED BY: MWE
JOB NO: 2014-009 — FILE: 2014-009-CLUB RMS DT.dwg



WALL TYPES



FIRST FLOOR PLAN

1/4"=1'-0"

JYA
Jeffrey Yates Architecture
60 Thoreau Street, Suite 112
Concord, MA 01742
978-952-2525
www.jyatesarch.com

ISSUED	DATE
PERMIT SET	8-14-13
CONSTRUCTION	9-12-13
REV. CONST.	1-20-15
REV. CONST.	9-18-15
PERMIT SET	7-24-17

FIRST FLOOR PLAN

VILLA

3 STORY

64 Simonds Road

The Village at Willowbend

Mashpee, MA

SCALE: SHOWN

DRAWN BY

A-1

REFER TO FIRST FLOOR PLANFOR DIMENSIONS AND TYPICAL NOTES.

SECOND FLOOR PLAN

1/4"=1'-0"

JYA

Jeffrey Yates Architecture
60 Thoreau Street, Suite 112
Concord, MA 01742
978-952-2525
www.jyatesarch.com

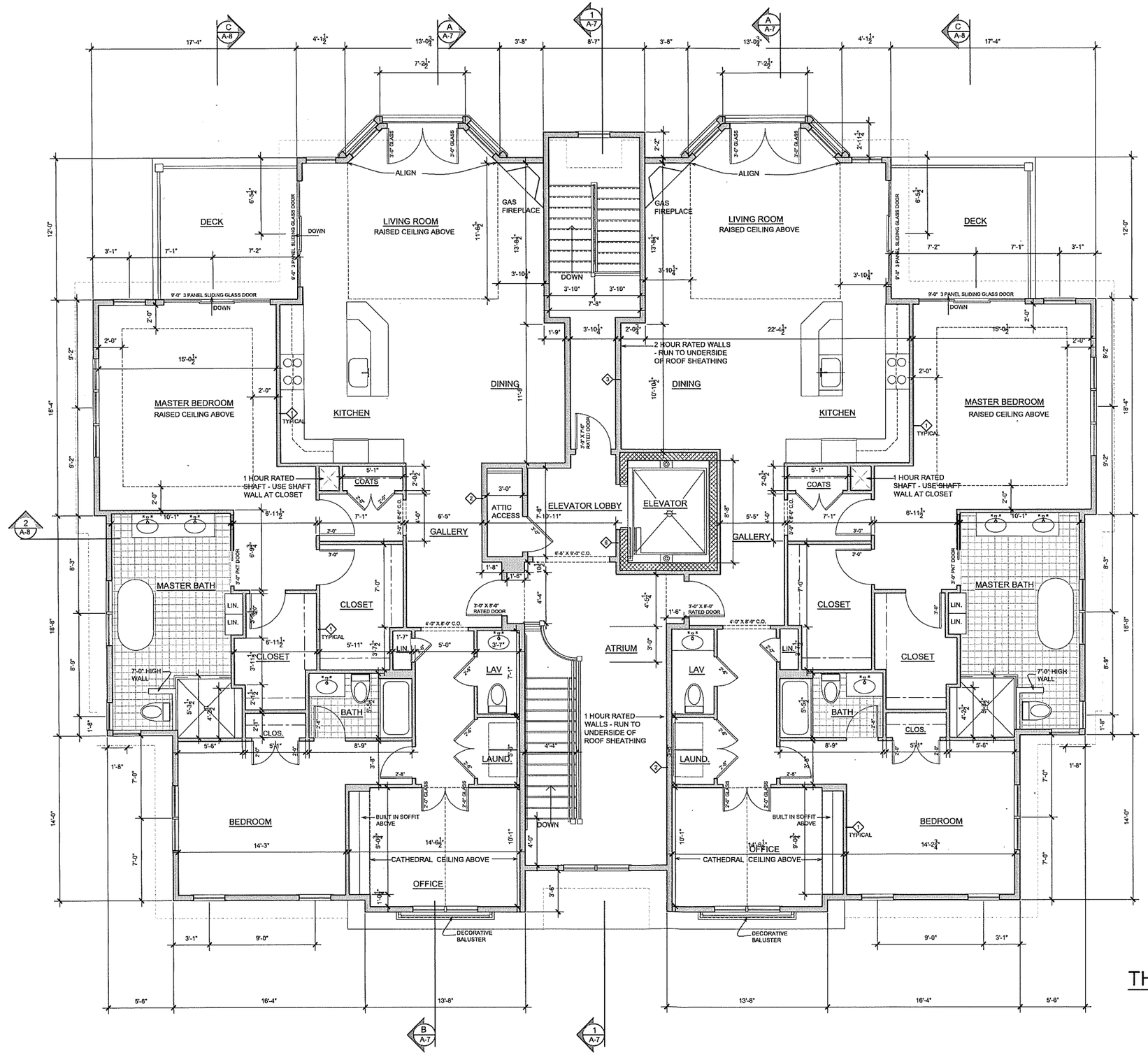
ISSUED	DATE
PERMIT SET	8-14-13
CONSTRUCTION	9-12-13
REV. CONST.	1-20-15
REV. CONST.	9-18-15
PERMIT SET	7-24-17

SECOND FLOOR PLAN
VILLA
3 STORY

64 Simonds Road
The Village at Willowbend
Mashpee, MA

SCALE: SHOWN
DRAWN BY

A-2



REFER TO FIRST AND SECOND FLOOR PLANFOR DIMENSIONS AND TYPICAL NOTES.

THIRD FLOOR PLAN

$\frac{1}{4}$"=1'-0"

JYA

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www.jyatesarch.com

ISSUED	DATE
PERMIT SET	8-14-13
CONSTRUCTION	9-12-13
REV. CONST.	1-20-15
REV. CONST.	9-18-15
PERMIT SET	7-24-17

THIRD FLOOR PLAN

VILLA

3 STORY

64 Simonds Road

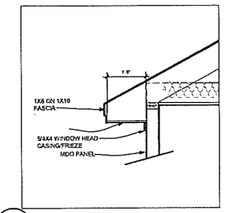
The Village at Willowbend

Mashpee, MA

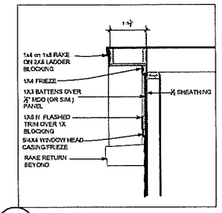
SCALE: SHOWN

DRAWN BY

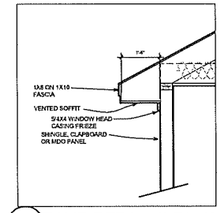
A-3



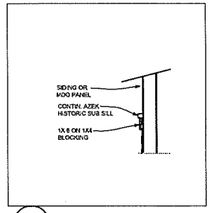
D1 EAVE DETAIL @ PANELS
3/8"=1'-0"



D2 RAKE DETAIL @ BOARD & BATTEN
3/8"=1'-0"



D3 EAVE DETAIL SIDING
3/8"=1'-0"



D4 DETAIL AT BAND
3/8"=1'-0"

PROPOSED WINDOW SCHEDULE - TO BE VERIFIED

WINDOWS ARE PELLA PROLINE

	TYPE	PELLA DESIGNATION	ROUGH OPENING	REMARKS	QTY
A	DH	2959	29 3/4 " X 59 3/4"	TEMP. WHERE REQ.	70
A/T	TRANS	2959/2917	29 3/4" X 76 3/4"		10
C	CSMNT	2341	23 3/4" X 41 3/4"	6 LEFT/6 RIGHT	12
D	SL. GL. DR	10896	108 3/4" X 96		12
E	GL.DOOR/TRAN	7286/71.2514	72" X 100 1/2"		4
F	FIXED GL. DR/TRAN	3686/3614	36 3/4" X 100 1/2"		8
G	GL. DR/TRAN	7286/71.2525	72" X 111 1/2"		2
H	FIXED GL. DR/TRAN	3686/3625	36 3/4" X 111 1/2"		4
I	FIXED	2935	29 3/4" X 35 3/4"		2
J	AWNING	2929	29 3/4" X 29 3/4"		1

CONTRACTOR TO VERIFY ALL SIZES AND QUANTITIES AND GRILL OPTIONS BEFORE PLACING ORDER.

FRONT ELEVATION
1/4"=1'-0"

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50 Thoreau Street, Suite 112
Concord, MA 01742
978-952-2525
www.jyatesarch.com

ISSUED	DATE
PERMIT SET	8-14-13
CONSTRUCTION	9-12-13
REV. CONST.	1-20-15
REV. CONST.	9-18-15
PERMIT SET	7-24-17

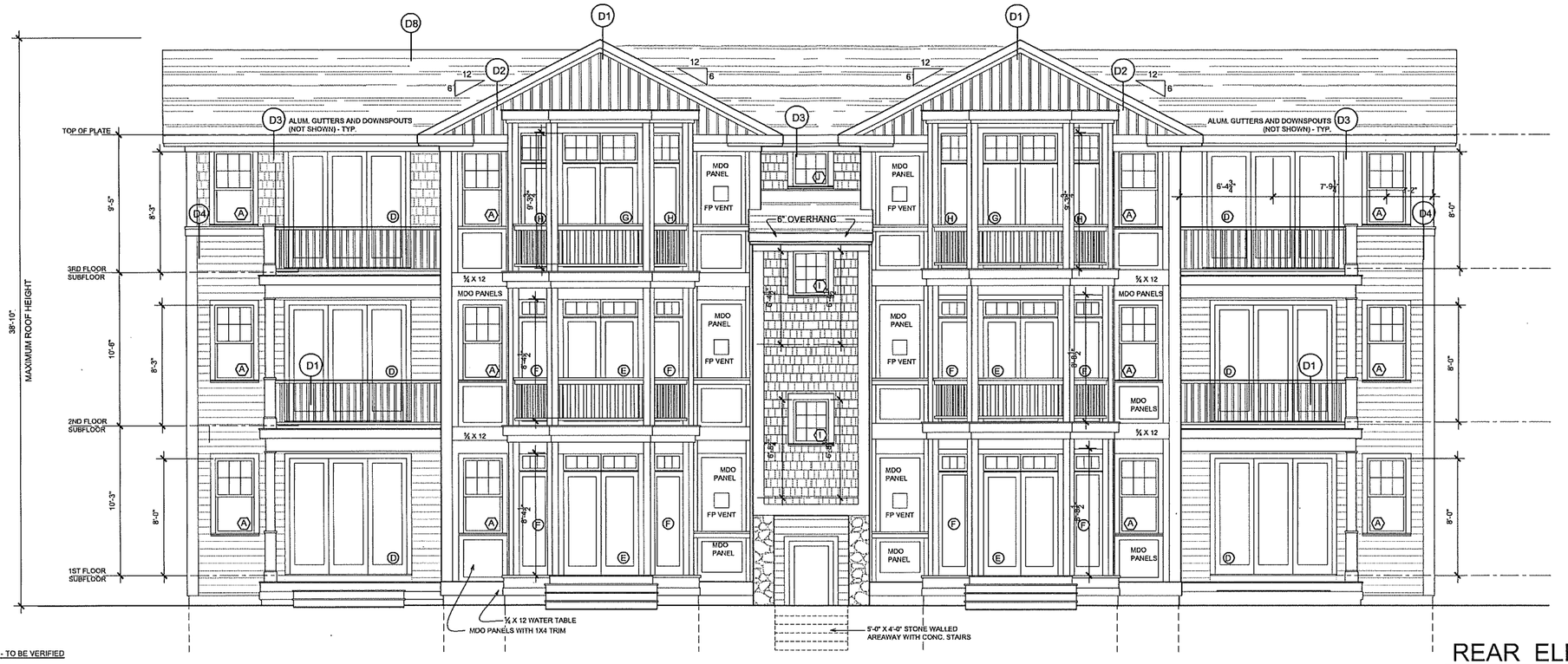
ELEVATIONS, DETAILS

VILLA
3 STORY

64 Simonds Road
The Village at Willowbend
Mashpee, MA

SCALE: SHOWN
DRAWN BY

A-5



REAR ELEVATION

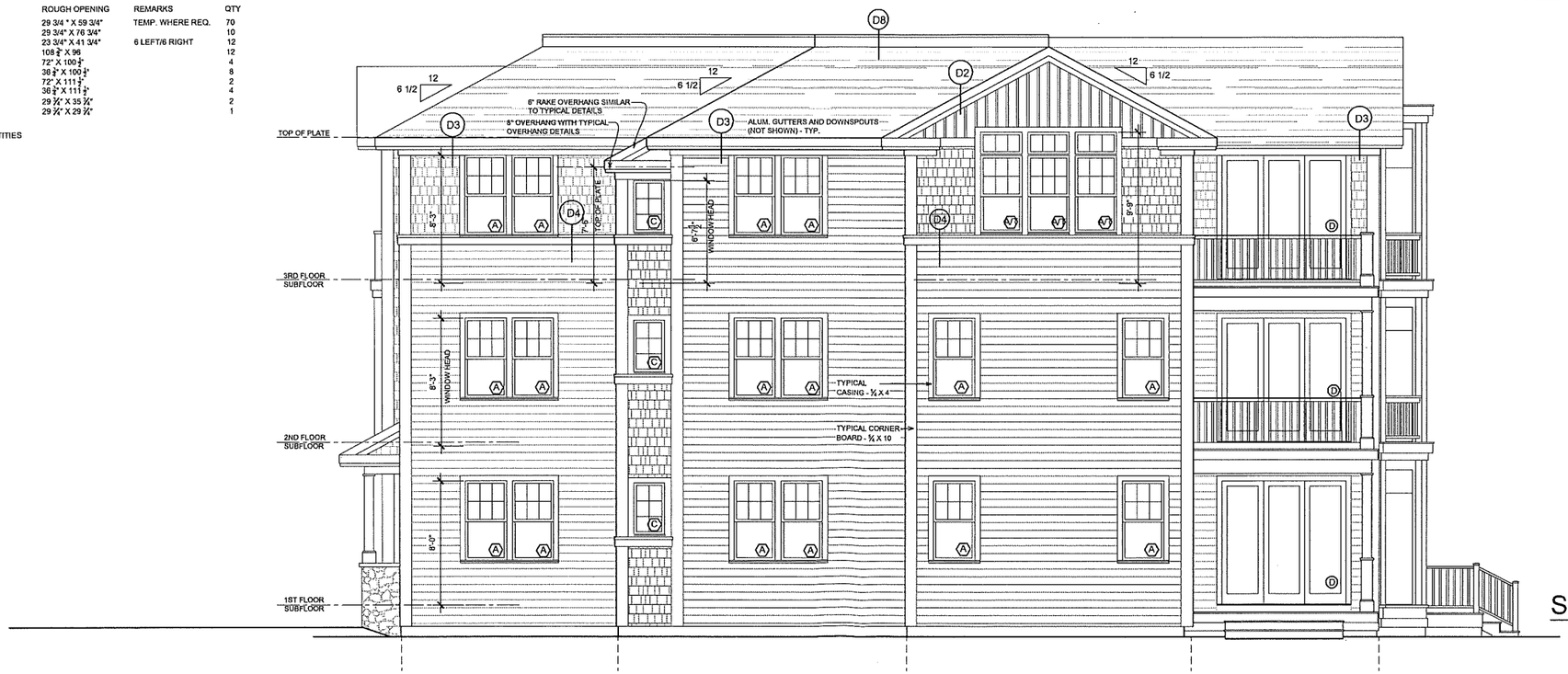
$\frac{1}{4}$"=1'-0"

PROPOSED WINDOW SCHEDULE - TO BE VERIFIED

WINDOWS ARE PELLA PROLINE

	TYPE	PELLA DESIGNATION	ROUGH OPENING	REMARKS	QTY
A	DH	2959	29 3/4 " X 59 3/4"	TEMP. WHERE REQ.	70
A/T	TRANS	2959/2917	29 3/4" X 76 3/4"		10
C	CSMNT	2341	23 3/4" X 41 3/4"	6 LEFT/6 RIGHT	12
D	SL. GL. DR	10896	108 ¾" X 96		12
E	GL.DOOR/TRAN	7286/71,2514	72" X 100 ¾"		4
F	FIXED GL. DR/TRAN	3686/3614	36 ¾" X 100 ¾"		8
G	GL. DR/TRAN	7286/71,2525	72" X 111 ¾"		2
H	FIXED GL. DR/TRAN	3686/3625	36 ¾" X 111 ¾"		4
I	FIXED	2935	29 ¾" X 35 ¾"		2
J	AWNING	2929	29 ¾" X 29 ¾"		1

CONTRACTOR TO VERIFY ALL SIZES AND QUANTITIES AND GRILL OPTIONS BEFORE PLACING ORDER.



SIDE ELEVATION

$\frac{1}{4}$"=1'-0"

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ISSUED	DATE
PERMIT SET	8-14-13
CONSTRUCTION	9-12-13
REV. CONST.	1-20-15
REV. CONST.	9-18-15
PERMIT SET	7-24-17

ELEVATIONS

VILLA

3 STORY

64 Simonds Road

The Village at Willowbend

Mashpee, MA

SCALE: SHOWN

DRAWN BY

A-6

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ENGINEERING & SURVEYING

STORMWATER MANAGEMENT REPORT

for

CLUB ROOM VILLAS AT WILLOWBEND

WILLOWBEND DRIVE

WILLOWBEND COUNTRY CLUB

MASHPEE, MASSACHUSETTS

Prepared for:

SOUTHWORTH MASHPEE PROPERTIES, LLC

130 WILLOWBEND DRIVE

MASHPEE, MASSACHUSETTS

APRIL 14, 2020

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Registered Professional Engineers, Land Surveyors & Scientists

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PROJECT STATEMENT

PROJECT: Proposed Condominiums

LOCATION: Willowbend Drive Willowbend Country Club, Mashpee, MA

BN JOB NUMBER: 2014-009

CLIENT: Southworth Mashpee Properties, LLC

SUBJECT: Stormwater Management & Drainage Calculations

OBJECTIVES:

1) Meet the objectives of the Town of Mashpee Zoning Ordinance & MA DEP SWM Policy
   (a) Evaluate the pre-development conditions and calculate the peak rate of runoff.
   (b) Evaluate the post-development conditions and provide stormwater management and treatment to prevent any increase in the 2 and 10-year storms, from the pre-development conditions peak discharge at the site study point.
   (c) Safely pass the 100-year storm event without causing any downstream detrimental impact.
   (d) Provide for Water Quality Treatment for the first flush 0.5" of rainfall in accordance with MDEP SWM Policy
   (e) Provide for Groundwater Recharge in accordance with MDEP SWM Policy.

CALCULATION METHODS & DESIGN STORMS:

1) Soil information was taken from the SCS Soil Survey of Barnstable County.
2) Sub-catchment areas, flow paths, and design points were delineated using standard engineering practice.
3) The existing and proposed conditions were modeled using HydroCAD, which incorporates the methodologies of SCS TR-55 and TR-20.
4) The proposed stormwater management system was designed to control the 2, 10, and 25-year storm event using the SCS TR-20 Method. The 100-year storm event will pass safely through the system with no detrimental impact to downstream areas.
5) Private closed storm drain systems shall be sized for the 10-year storm event. Inlets and curb openings shall be analyzed for the 10-year storm event. All storm drain calculations will use the rational method.
6) Ditch and channel flow shall be analyzed for the 10-year storm event. Ditch and channel flow around buildings shall be analyzed for the 100-year event.

PROJECT NARRATIVE

Club Room Villas at Willowbend is a proposed project located within Willowbend Country Club and fronts on Quiniquisett Road. The project area is approximately 1.4 acres. The lot is zoned residential (R3) and the allowed use for the lot is residential. The project area is undeveloped. and is currently vacant. The project consists of a new residential townhome building. The proposed buildings consist of 6 units and vary between approximately 2,000 to 2,400 square feet per unit.

The proposed stormwater management systems (SMS) will be installed to control stormwater runoff for water quality and quantity in accordance with MDEP SWM Policy. Under the proposed conditions, both stormwater quantity and quality are controlled. The post-development peak storm discharges are reduced to pre-development levels or below for the 2, 10 and 25-year storms. The 100-year event is controlled, and all runoff is safely conveyed. The post-development water quality is treated through the SMS which provides an 80% or better total suspended solid (TSS) removal rate. The water recharge will be affected positively, as it will receive the same volume of runoff, but at attenuated peaks, thereby, reducing velocities and erosion.

SUMMARY

Based on the analysis performed for the 2, 10, 25 and 100-year storm events, the infiltration basin is adequately sized to mitigate potential increases in the peak rate of runoff and volume from the site. The "Discarded" flows shown within the HydroCAD analysis represent flows and volumes infiltrated directly into the ground through the SWM structures and are not discharged or released over land.

Table 1 is a summary of expected release rates based on total contributing drainage areas (both on-site and off-site areas). This table shows the expected post development runoff rates and volumes are decreased from the pre-development levels for the 2, 10, 25 and 100-year storms. The SWM systems treat, store and infiltrate (recharges) the post-development runoff volume for the 2, 10, 25 and 100-year storms. The control of the post-development volume to well below pre-development levels mitigates any downstream/offsite flooding impacts and provides for significant groundwater recharge. The benefit to the groundwater recharge is greatly enhanced, as shown by the reduction of volume runoff from the site for the 2, 10, 25 and 100-year events.

TABLE 1: PEAK DISCHARGE AND VOLUME RELEASE

STORM (YEAR)	DRAINAGE AREA	PRE-DEVELOPMENT		POST DEVELOPMENT	
		PEAK DISCHARGE (cfs)	VOLUME (ac-ft)	PEAK DISCHARGE (cfs)	VOLUME (ac-ft)
2	STUDY POINT #1	0.24	0.038	0.22	0.022
10	STUDY POINT #1	1.22	0.110	0.59	0.059
25	STUDY POINT #1	2.14	0.171	1.07	0.113
100	STUDY POINT #1	3.79	0.280	2.61	0.216

RECHARGE TO GROUNDWATER VOLUME

(MADEP Standard 3)

All site soils within area of proposed impervious cover are HSG A. Therefore, the recharge rate is:

= 0.4" x total impervious area

= 0.4" x 0.27 acres (roads and driveways) + 0.11 acres (roofs) = 0.38 acres

= 0.152 ac-in.

= 0.0127 ac.ft.

= 552 cf

The Infiltration SWM Facility is used for recharge and quantity control for post-development site runoff.

1) SWM Facility: Infiltration Storage Volume Provided up to Elevation 18.00:

= 1,970 cf

Therefore, total Volume of Recharge which is provided:

= 1,970 cf > 552 cf / Design Reqmts met

The Volume of Recharge well exceeds the required amount of recharge.

WATER QUALITY

VOLUME CALCULATIONS

(MADEP Standard 4-6)

The site is not within a Zone II Recharge Area, which is defined as a Critical Area. Therefore, the Water Quality Treatment must address the first half inch (0.5") of runoff over the total impervious area. The proposed increased on-site impervious area equals 0.38 acres. The proposed building roof area is 0.11 acres, which is conveyed directly to the swm basins and does not required water quality treatment. The total impervious area to receive water quality treatment is 0.27 acres.

WQV = 0.5"x (acres of impervious area)

= 0.5" x (0.27 acres)

= 0.135 acre-inches

= 0.135/12 in/ft

= 0.01125 acre-feet

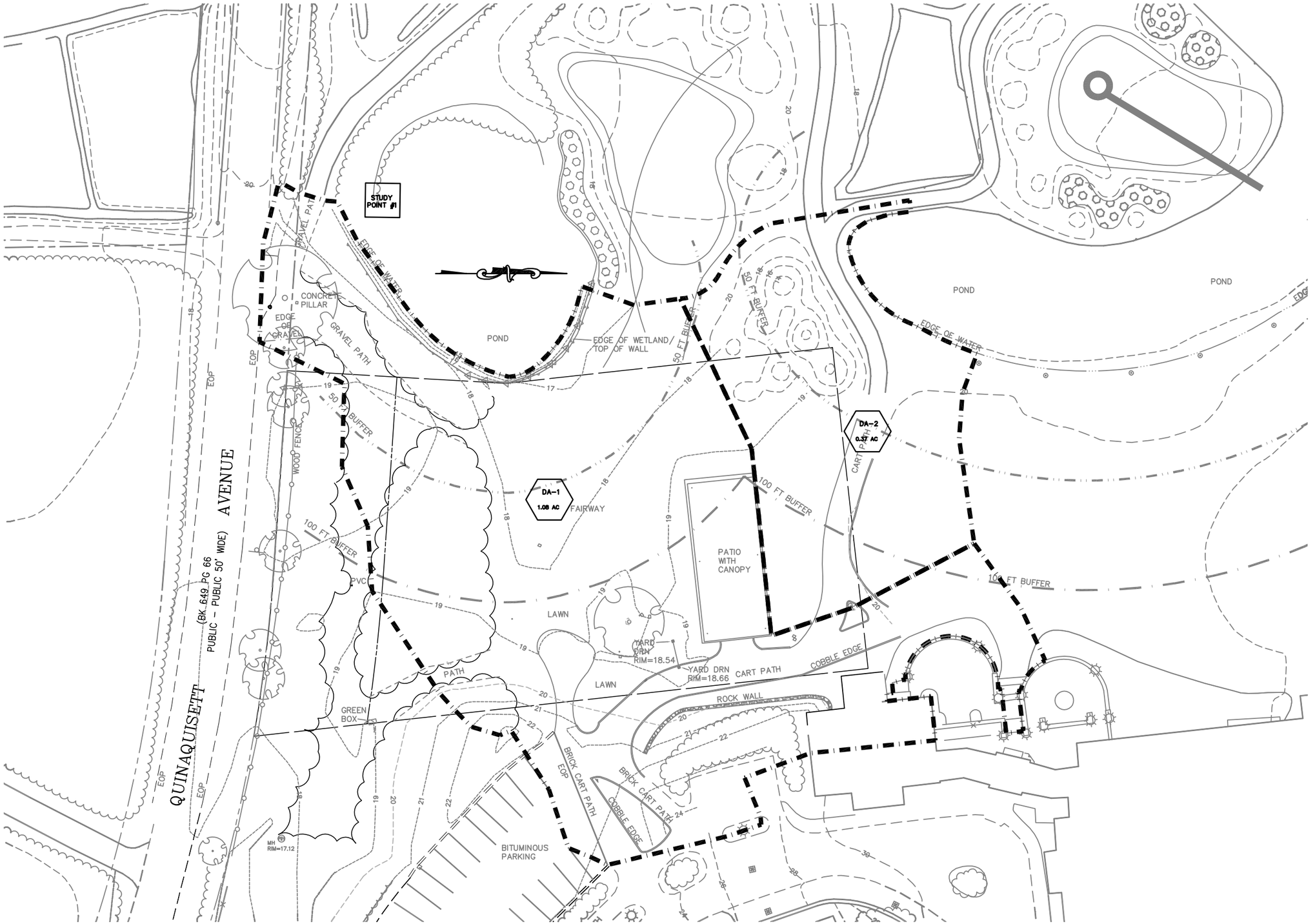
= 0.01125 acre-feet x 43,560 sf/ac = 490 +/- cubic feet

The total WQV to be treated through BMP's is 490 cf.

The total water quality treatment volume provided = 493 cubic feet at elevation 17.0

FIGURE 1

Pre-Development Drainage Plan



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CONSULTANT

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PREPARED FOR:
SOUTHWORTH MASHPEE PROPERTIES, LLC
130 Willowbend Drive
Mashpee MA 02549

PROJECT TITLE
Willowbend Country Club
Clubhouse Villas

DATE	DESCRIPTION

SHEET TITLE
Pre Development Drainage Areas Plan

SHEET NO
DA1.0

DATE: APRIL 14, 2020

20 0 20 40
SCALE IN FEET

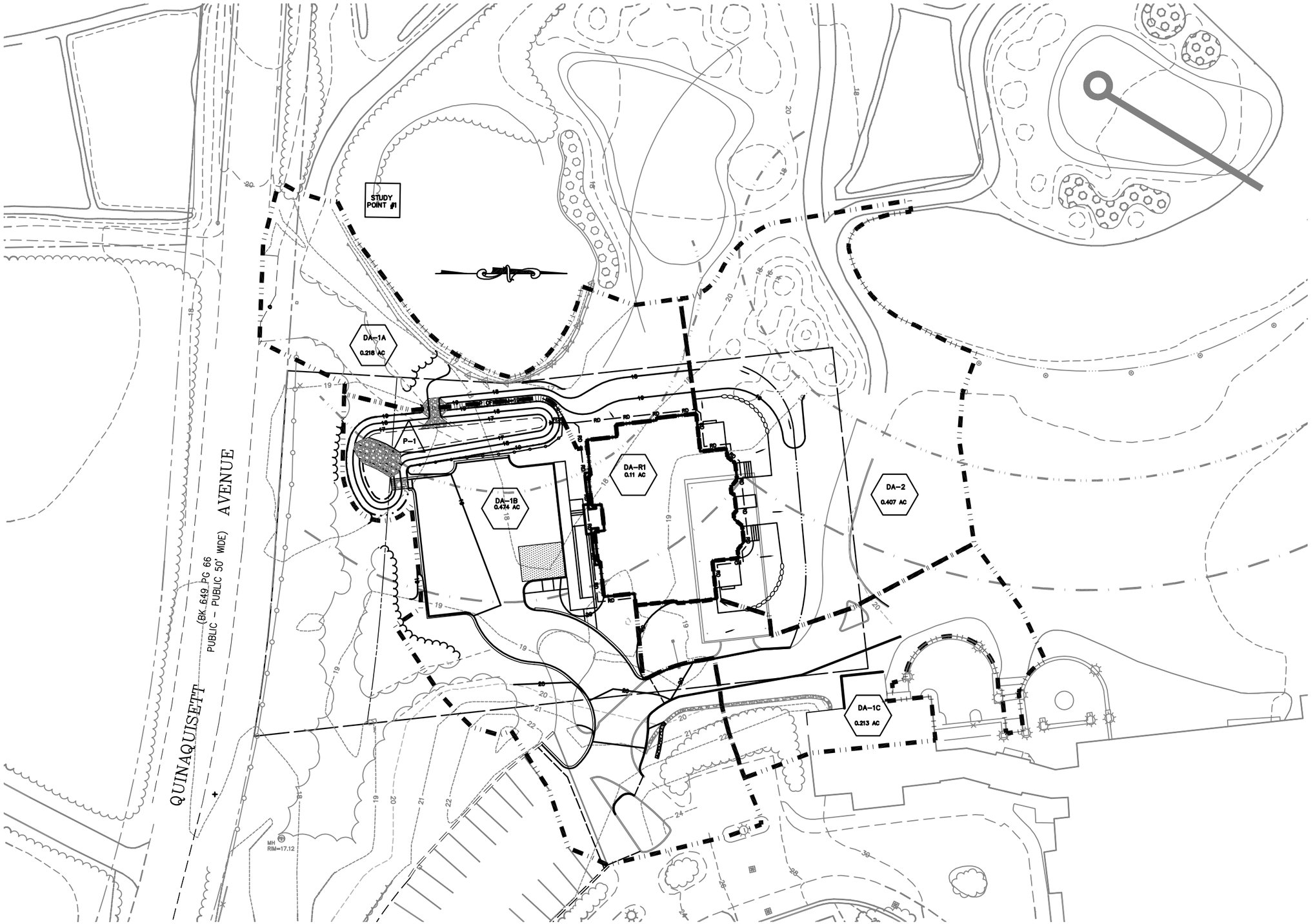
SCALE: 1"=20'

DRAWN BY: SDM CHECKED BY: MME

JOB NO: 2014-009 FILE: 2014-009 CLUB RMS DA.dwg

FIGURE 2

Post Development Drainage Plan



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PROPERTIES, LLC
130 Willowbend Drive
Mashpee MA 02549

PROJECT TITLE
Willowbend Country Club
Clubhouse Villas

	DATE	DESCRIPTION

SHEET TITLE
Post Development Drainage Areas Plan

SHEET NO
DA1.1

DATE: APRIL 14, 2020

20 0 20 40
SCALE IN FEET

SCALE: 1"=20'

DRAWN BY: SDM CHECKED BY: MWE

JOB NO: 2014-009 FILE: 2014-009 CLUB RMS DA.dwg

TSS REMOVAL CALCULATION WORKSHEET

PROPOSED

location CLUB ROOMS
Job # 2014-009

TSS REMOVAL CALCULATION WORKSHEET

SWM FACILITY

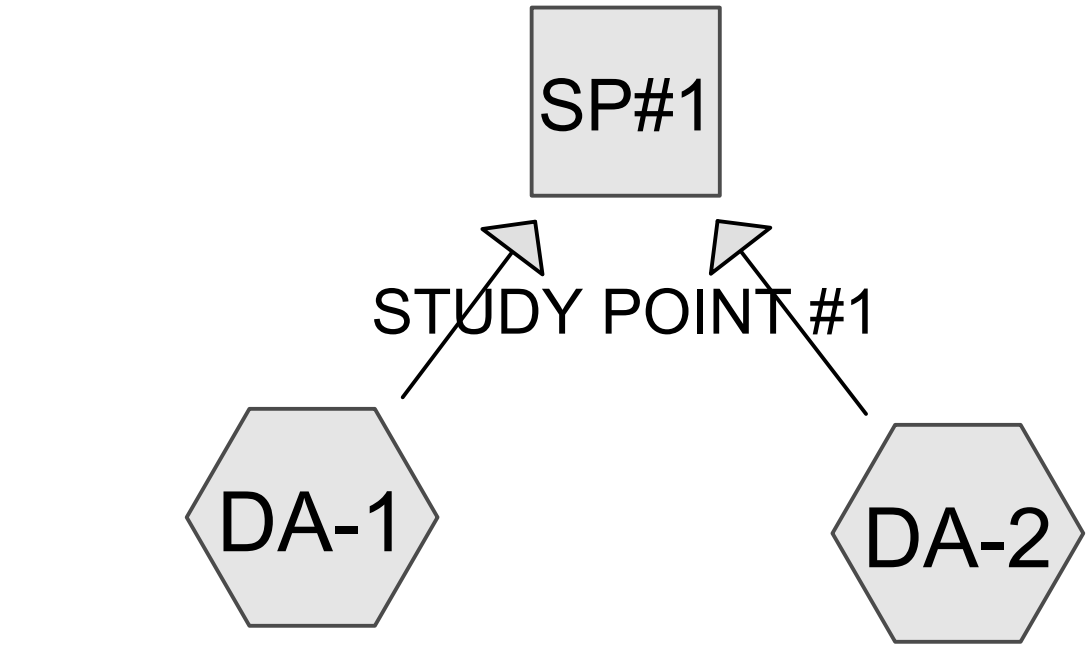
A BMP	B TSS Removal Rate	C Starting TSS Load *	D Amount Removed (BxC)	E Remaining Load (C-D)
Sediment Forebay	25%	1.00	0.25	0.75
Infiltration Basin	80%	0.75	0.60	0.15
		Total TSS Removed =	**0.85**	

*Equals remaining load from previous BMP (E)

APPENDIX A

PRE-DEVELOPMENT

WATERSHED RUNOFF & ROUTING



EXISTING PARKING, CART PATH AND ABUTTING EXISTING POND

GRASS AND CART PATH ABUTTING POND

Subcat Reach Pond Link

Routing Diagram for 2014-009 CLUB RMS EXISTING
Prepared by BAXTER-NYE ENGINEERING, Printed 4/14/2020

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.930	39	>75% Grass cover, Good, HSG A (DA-1, DA-2)
0.380	98	Paved parking, HSG A (DA-1, DA-2)
0.140	30	Woods, Good, HSG A (DA-1)
1.450	**54**	**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
0.930	0.000	0.000	0.000	0.000	0.930	>75% Grass cover, Good	DA-1, DA-2
0.380	0.000	0.000	0.000	0.000	0.380	Paved parking	DA-1, DA-2
0.140	0.000	0.000	0.000	0.000	0.140	Woods, Good	DA-1
1.450	**0.000**	**0.000**	**0.000**	**0.000**	**1.450**	**TOTAL AREA**	

Summary for Subcatchment DA-1: EXISTING PARKING, CART PATH AND ABUTTING EXISTING PON

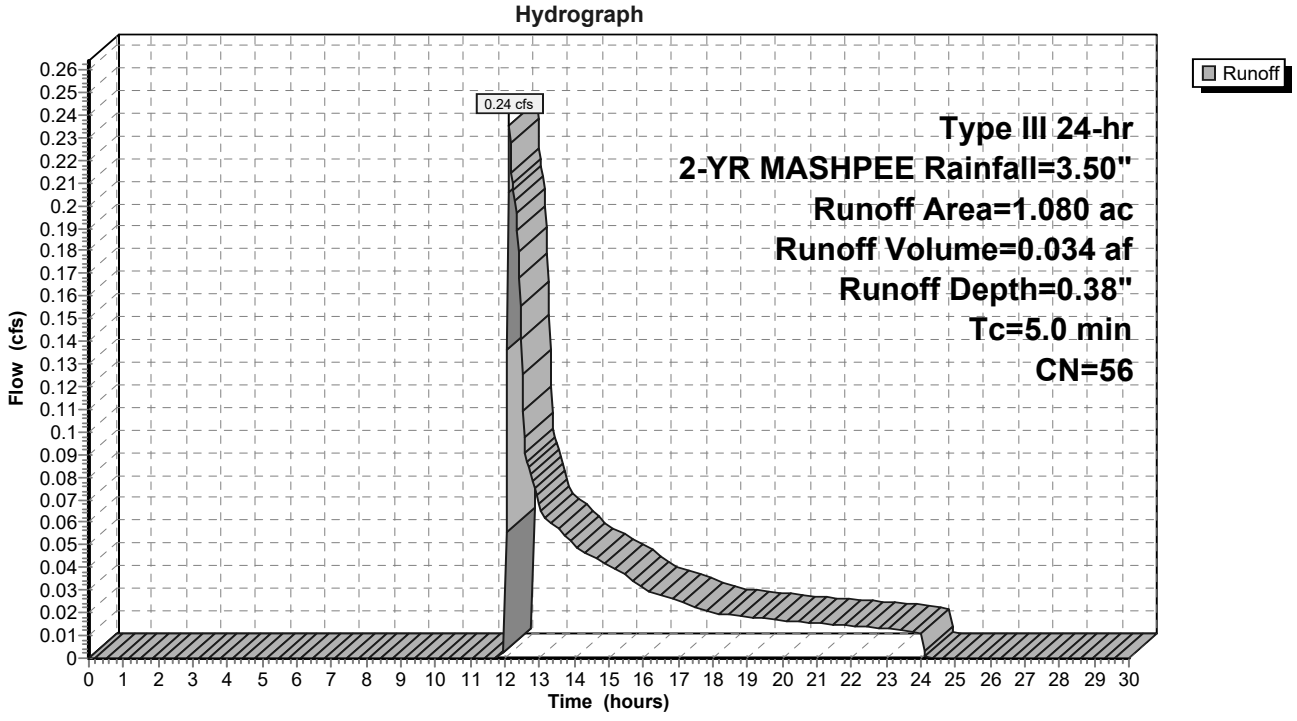
Runoff = 0.24 cfs @ 12.13 hrs, Volume= 0.034 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YR MASHPEE Rainfall=3.50"

Area (ac)	CN	Description
0.610	39	>75% Grass cover, Good, HSG A
0.140	30	Woods, Good, HSG A
0.330	98	Paved parking, HSG A
1.080	56	Weighted Average
0.750		69.44% Pervious Area
0.330		30.56% Impervious Area

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

Subcatchment DA-1: EXISTING PARKING, CART PATH AND ABUTTING EXISTING POND



Summary for Subcatchment DA-2: GRASS AND CART PATH ABUTTING POND

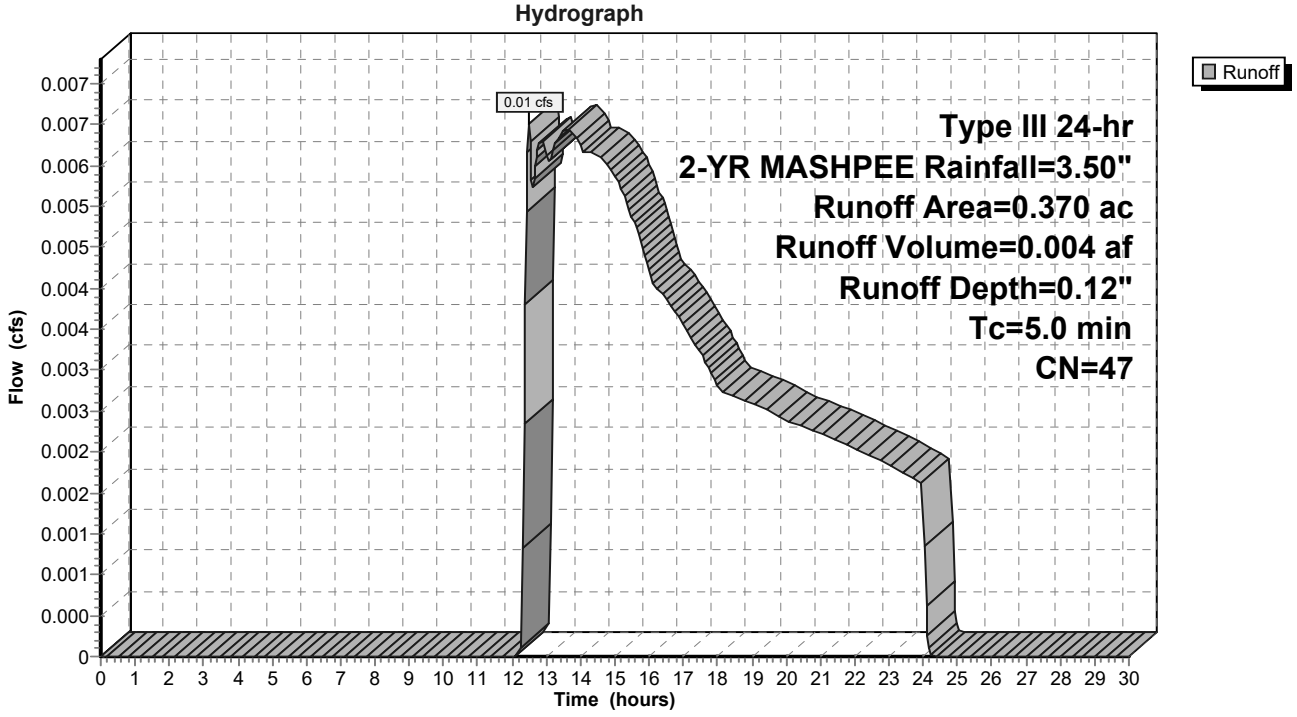
Runoff = 0.01 cfs @ 12.49 hrs, Volume= 0.004 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YR MASHPEE Rainfall=3.50"

Area (ac)	CN	Description
0.320	39	>75% Grass cover, Good, HSG A
0.050	98	Paved parking, HSG A
0.370	47	Weighted Average
0.320		86.49% Pervious Area
0.050		13.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, L1**

Subcatchment DA-2: GRASS AND CART PATH ABUTTING POND

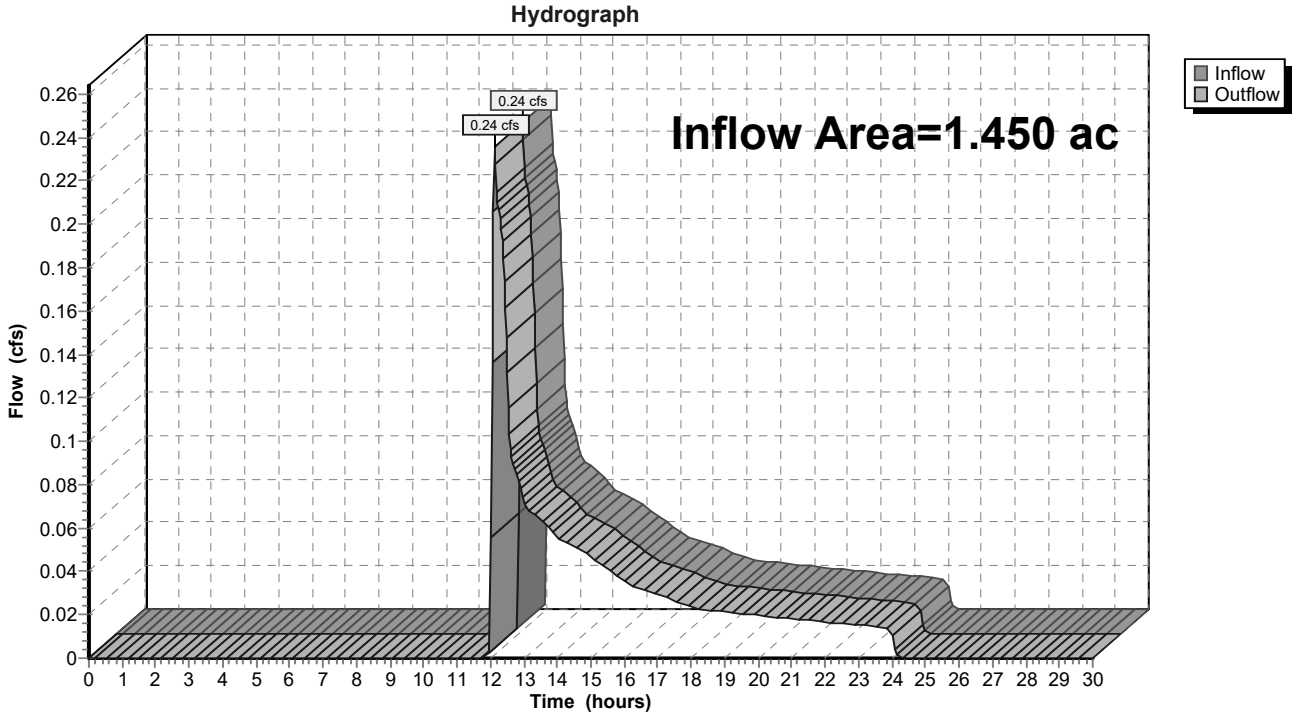


Summary for Reach SP#1: STUDY POINT #1

Inflow Area = 1.450 ac, 26.21% Impervious, Inflow Depth = 0.31" for 2-YR MASHPEE event
Inflow = 0.24 cfs @ 12.13 hrs, Volume= 0.038 af
Outflow = 0.24 cfs @ 12.13 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs / 3

Reach SP#1: STUDY POINT #1



Summary for Subcatchment DA-1: EXISTING PARKING, CART PATH AND ABUTTING EXISTING PON

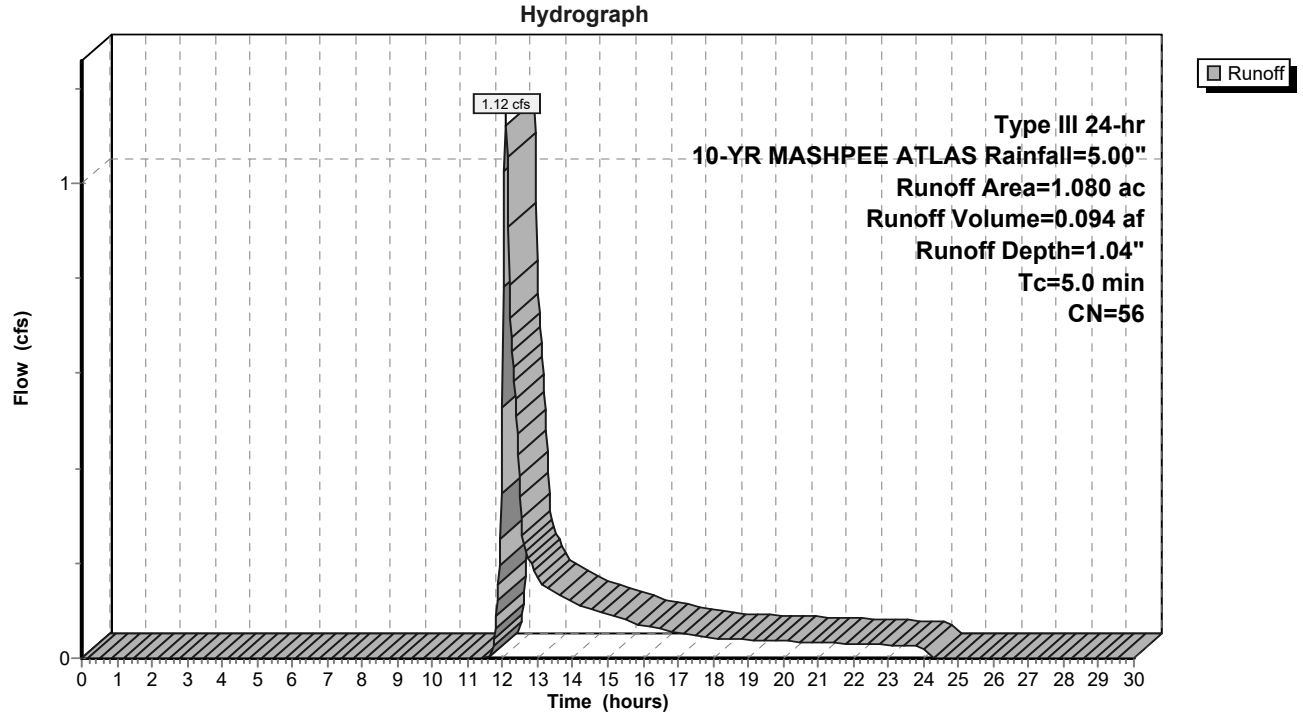
Runoff = 1.12 cfs @ 12.09 hrs, Volume= 0.094 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YR MASHPEE ATLAS Rainfall=5.00"

Area (ac)	CN	Description
0.610	39	>75% Grass cover, Good, HSG A
0.140	30	Woods, Good, HSG A
0.330	98	Paved parking, HSG A
1.080	56	Weighted Average
0.750		69.44% Pervious Area
0.330		30.56% Impervious Area

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

Subcatchment DA-1: EXISTING PARKING, CART PATH AND ABUTTING EXISTING POND



Summary for Subcatchment DA-2: GRASS AND CART PATH ABUTTING POND

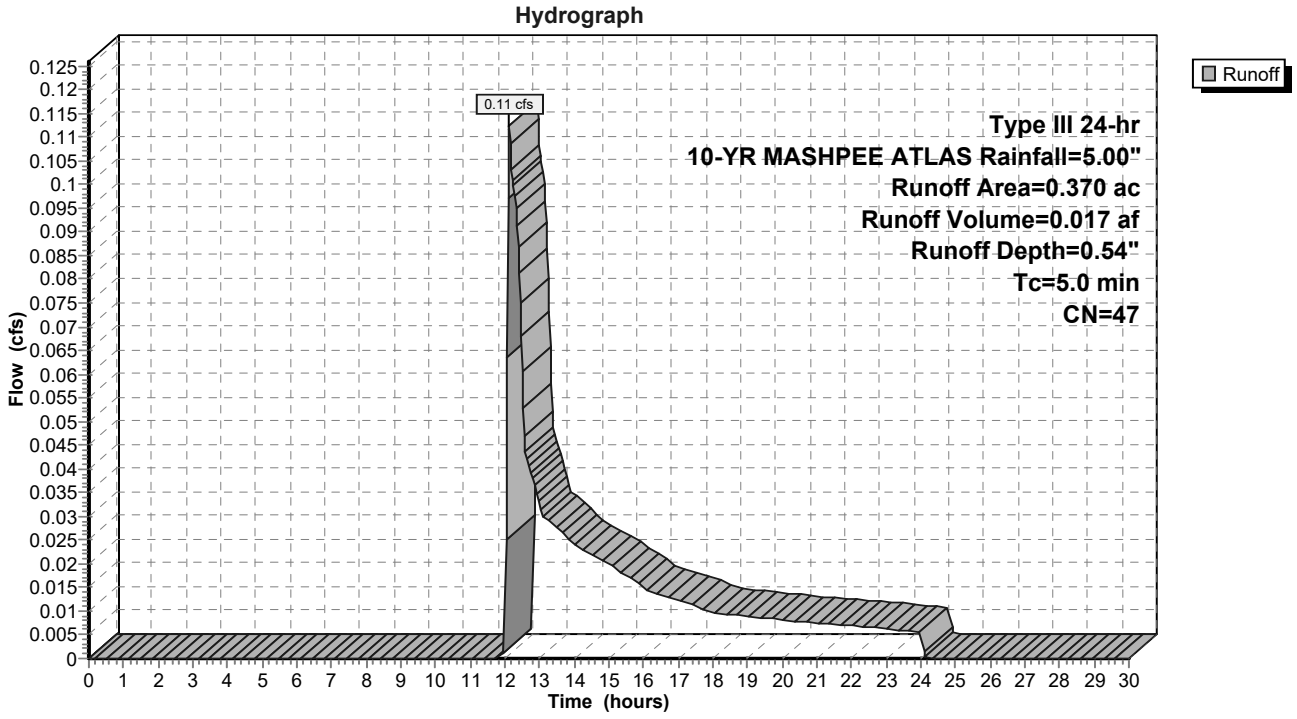
Runoff = 0.11 cfs @ 12.13 hrs, Volume= 0.017 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YR MASHPEE ATLAS Rainfall=5.00"

Area (ac)	CN	Description
0.320	39	>75% Grass cover, Good, HSG A
0.050	98	Paved parking, HSG A
0.370	47	Weighted Average
0.320		86.49% Pervious Area
0.050		13.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, L1**

Subcatchment DA-2: GRASS AND CART PATH ABUTTING POND

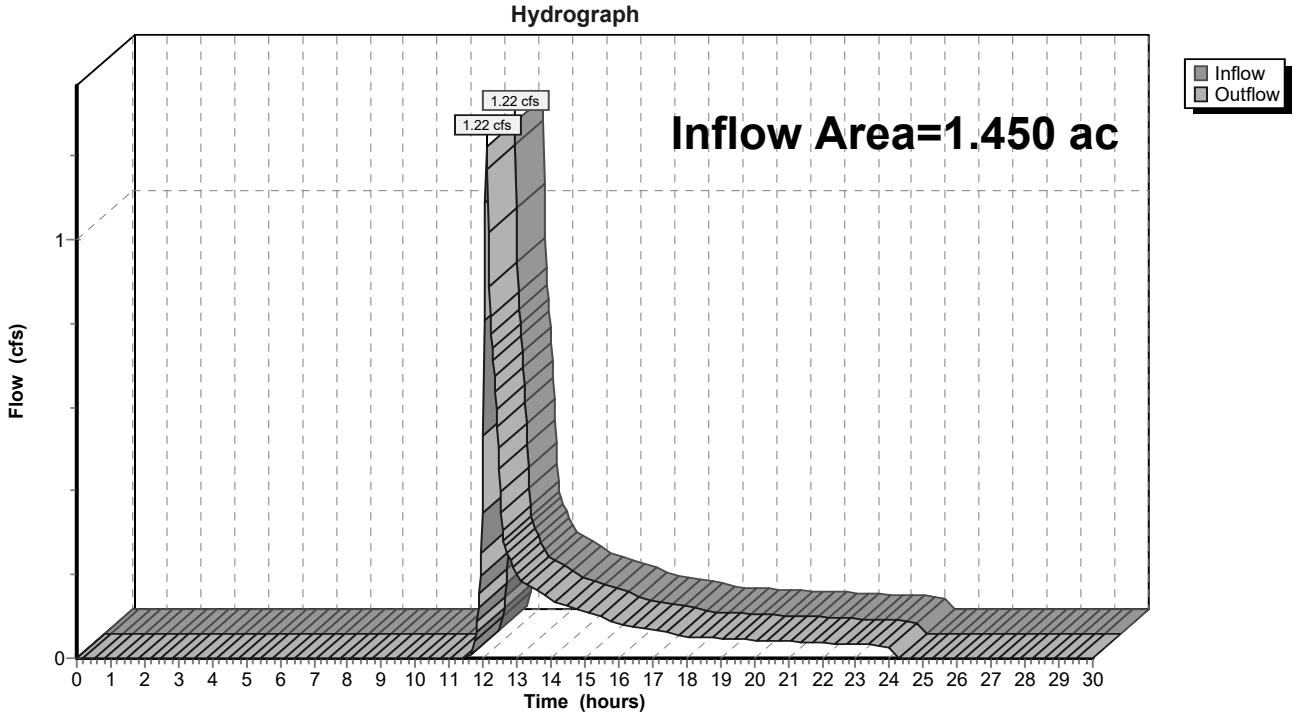


Summary for Reach SP#1: STUDY POINT #1

Inflow Area = 1.450 ac, 26.21% Impervious, Inflow Depth = 0.91" for 10-YR MASHPEE ATLAS event
Inflow = 1.22 cfs @ 12.10 hrs, Volume= 0.110 af
Outflow = 1.22 cfs @ 12.10 hrs, Volume= 0.110 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs / 3

Reach SP#1: STUDY POINT #1



Summary for Subcatchment DA-1: EXISTING PARKING, CART PATH AND ABUTTING EXISTING PON

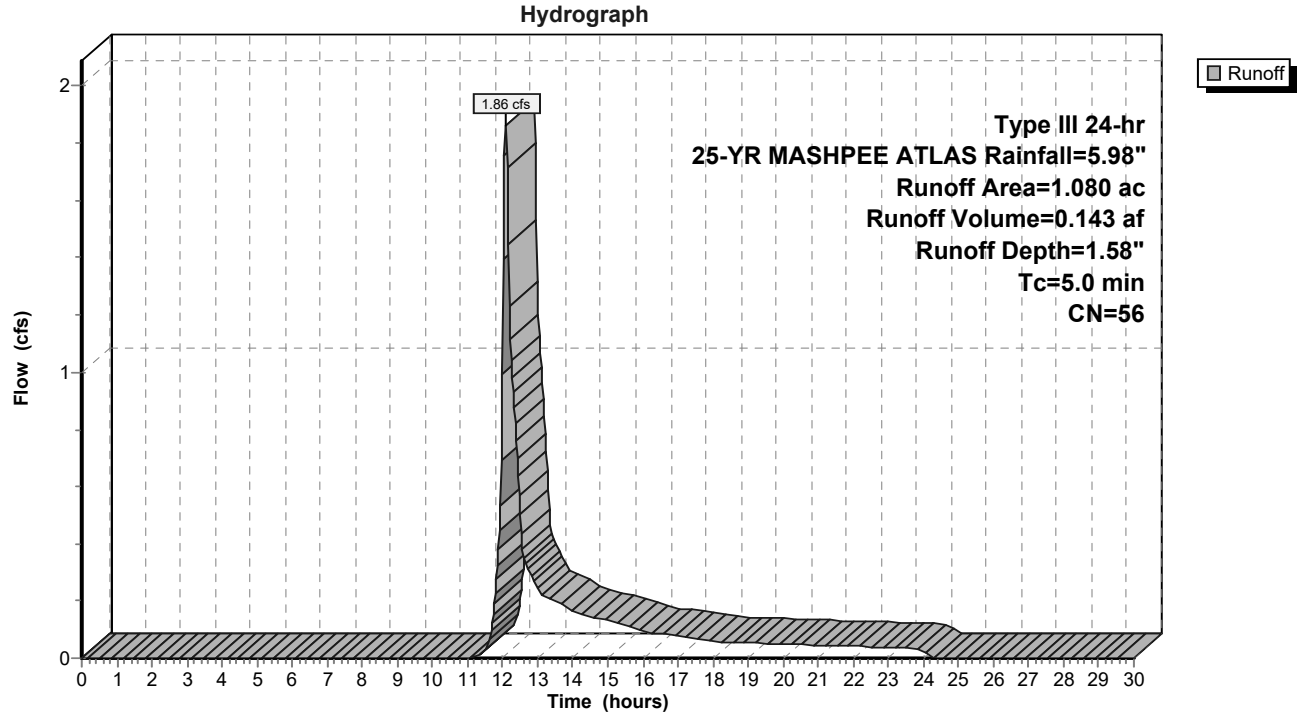
Runoff = 1.86 cfs @ 12.09 hrs, Volume= 0.143 af, Depth= 1.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YR MASHPEE ATLAS Rainfall=5.98"

Area (ac)	CN	Description
0.610	39	>75% Grass cover, Good, HSG A
0.140	30	Woods, Good, HSG A
0.330	98	Paved parking, HSG A
1.080	56	Weighted Average
0.750		69.44% Pervious Area
0.330		30.56% Impervious Area

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

Subcatchment DA-1: EXISTING PARKING, CART PATH AND ABUTTING EXISTING POND



Summary for Subcatchment DA-2: GRASS AND CART PATH ABUTTING POND

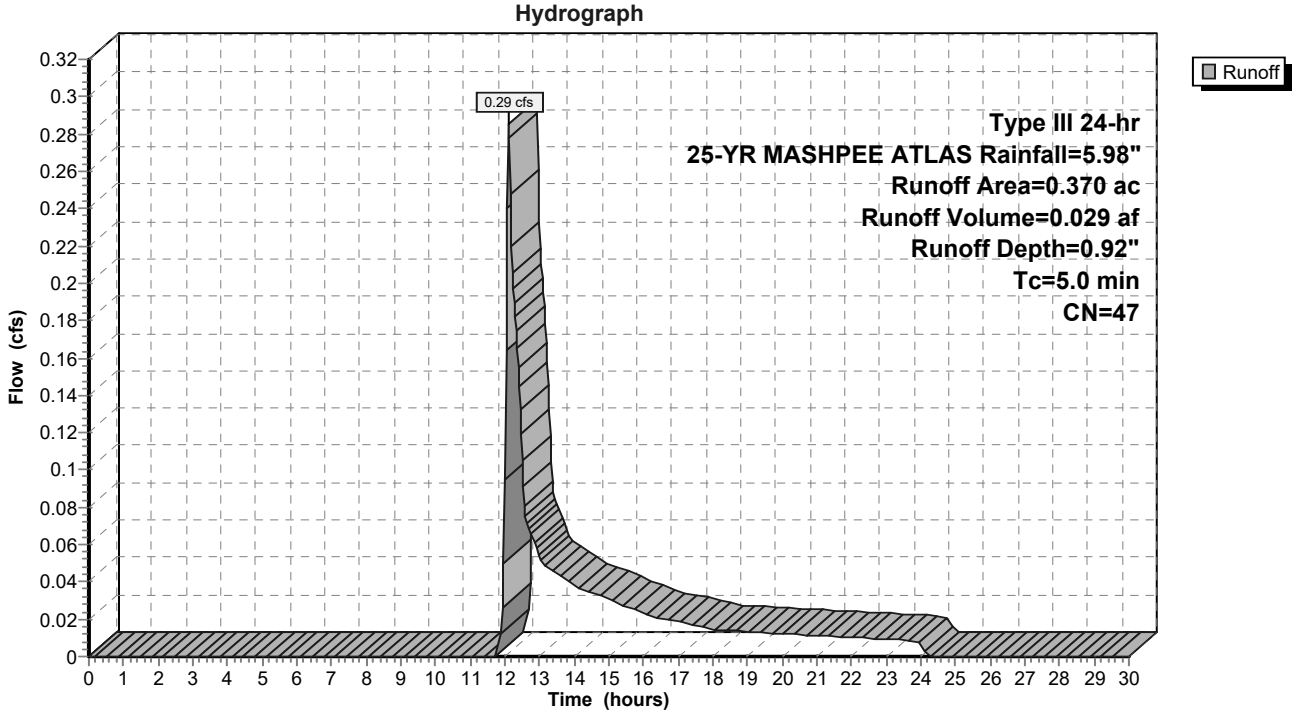
Runoff = 0.29 cfs @ 12.10 hrs, Volume= 0.029 af, Depth= 0.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YR MASHPEE ATLAS Rainfall=5.98"

Area (ac)	CN	Description
0.320	39	>75% Grass cover, Good, HSG A
0.050	98	Paved parking, HSG A
0.370	47	Weighted Average
0.320		86.49% Pervious Area
0.050		13.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, L1**

Subcatchment DA-2: GRASS AND CART PATH ABUTTING POND

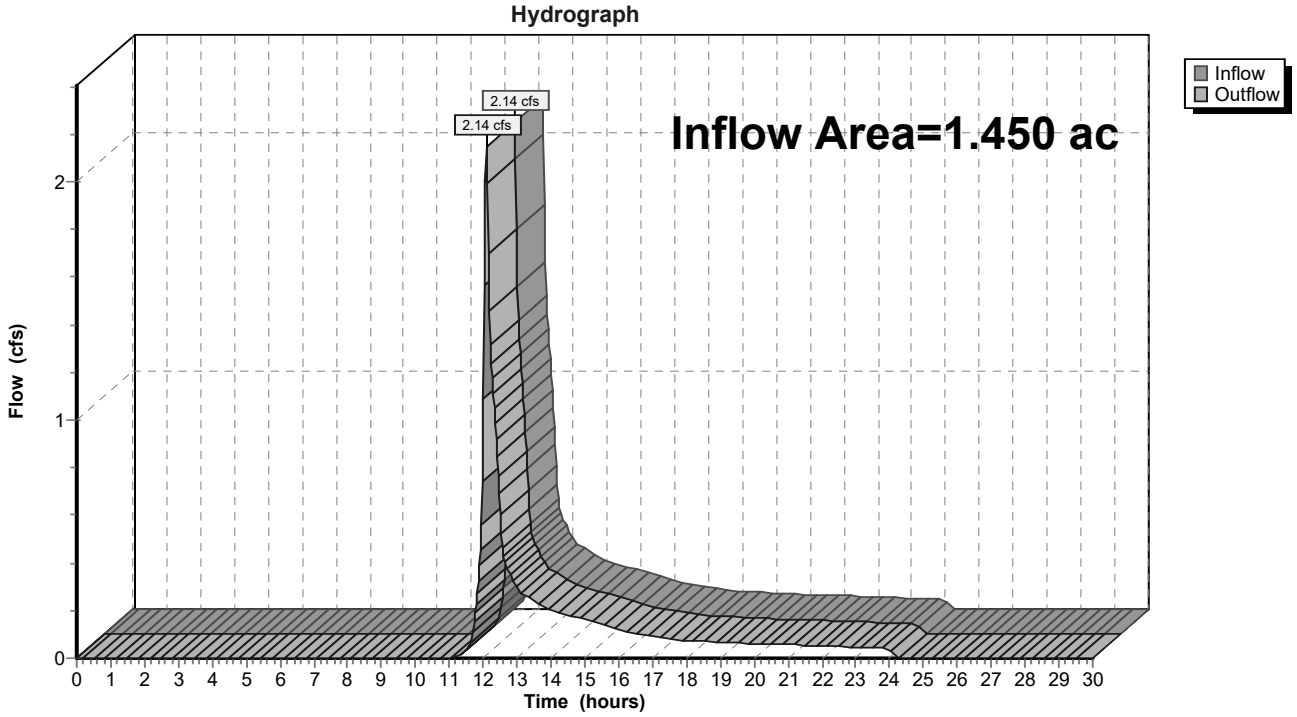


Summary for Reach SP#1: STUDY POINT #1

Inflow Area = 1.450 ac, 26.21% Impervious, Inflow Depth = 1.42" for 25-YR MASHPEE ATLAS event
Inflow = 2.14 cfs @ 12.09 hrs, Volume= 0.171 af
Outflow = 2.14 cfs @ 12.09 hrs, Volume= 0.171 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs / 3

Reach SP#1: STUDY POINT #1



Summary for Subcatchment DA-1: EXISTING PARKING, CART PATH AND ABUTTING EXISTING PON

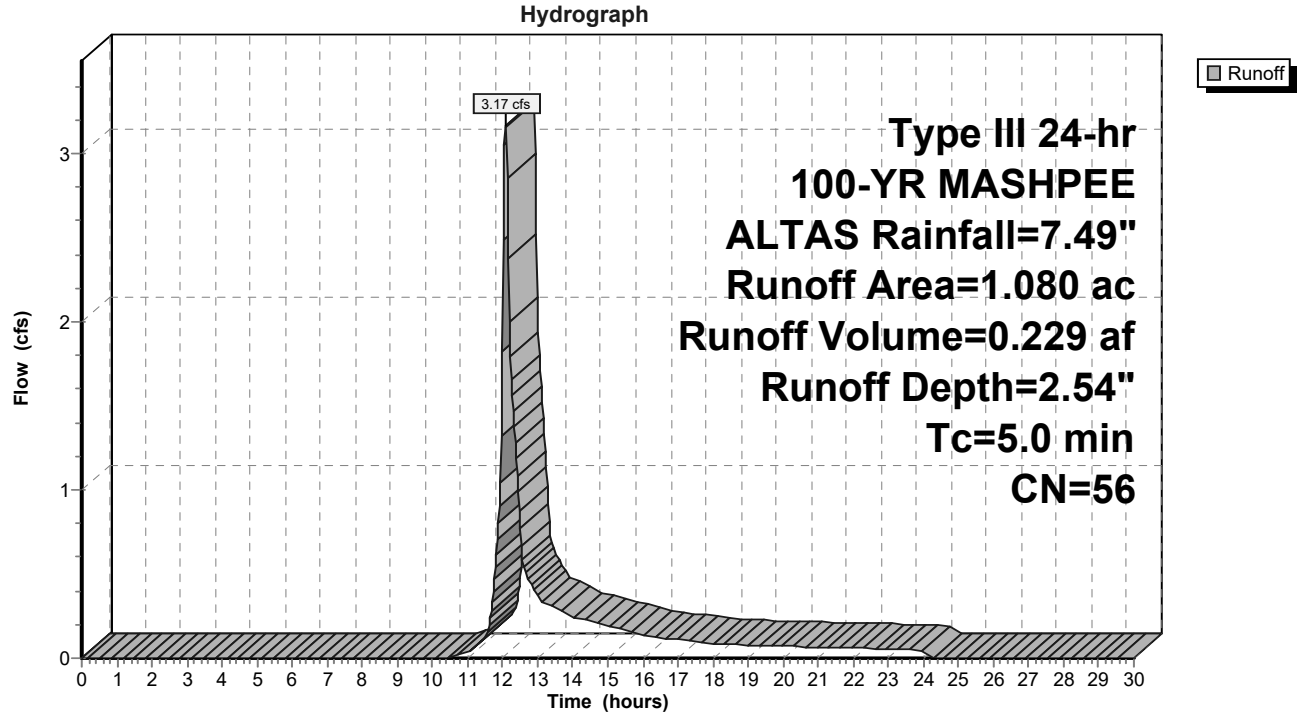
Runoff = 3.17 cfs @ 12.08 hrs, Volume= 0.229 af, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 100-YR MASHPEE ALTAS Rainfall=7.49"

Area (ac)	CN	Description
0.610	39	>75% Grass cover, Good, HSG A
0.140	30	Woods, Good, HSG A
0.330	98	Paved parking, HSG A
1.080	56	Weighted Average
0.750		69.44% Pervious Area
0.330		30.56% Impervious Area

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

Subcatchment DA-1: EXISTING PARKING, CART PATH AND ABUTTING EXISTING POND



Summary for Subcatchment DA-2: GRASS AND CART PATH ABUTTING POND

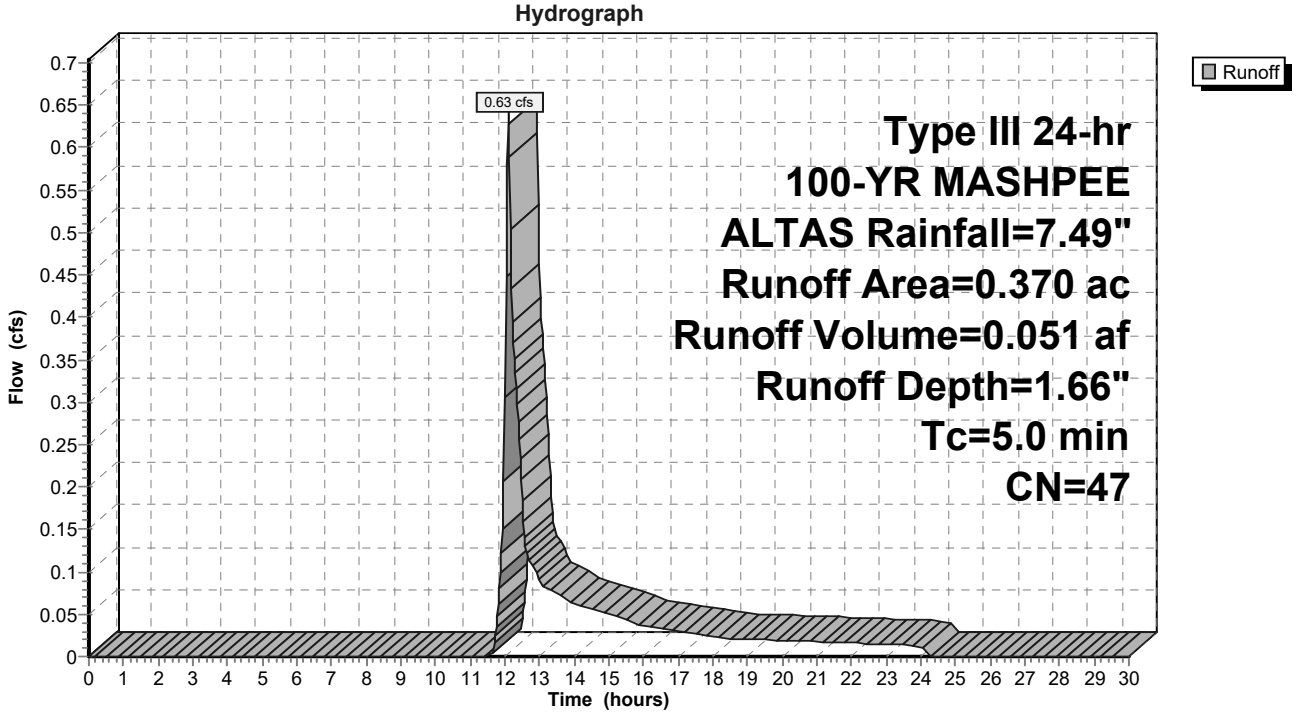
Runoff = 0.63 cfs @ 12.09 hrs, Volume= 0.051 af, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 100-YR MASHPEE ALTAS Rainfall=7.49"

Area (ac)	CN	Description
0.320	39	>75% Grass cover, Good, HSG A
0.050	98	Paved parking, HSG A
0.370	47	Weighted Average
0.320		86.49% Pervious Area
0.050		13.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, L1**

Subcatchment DA-2: GRASS AND CART PATH ABUTTING POND

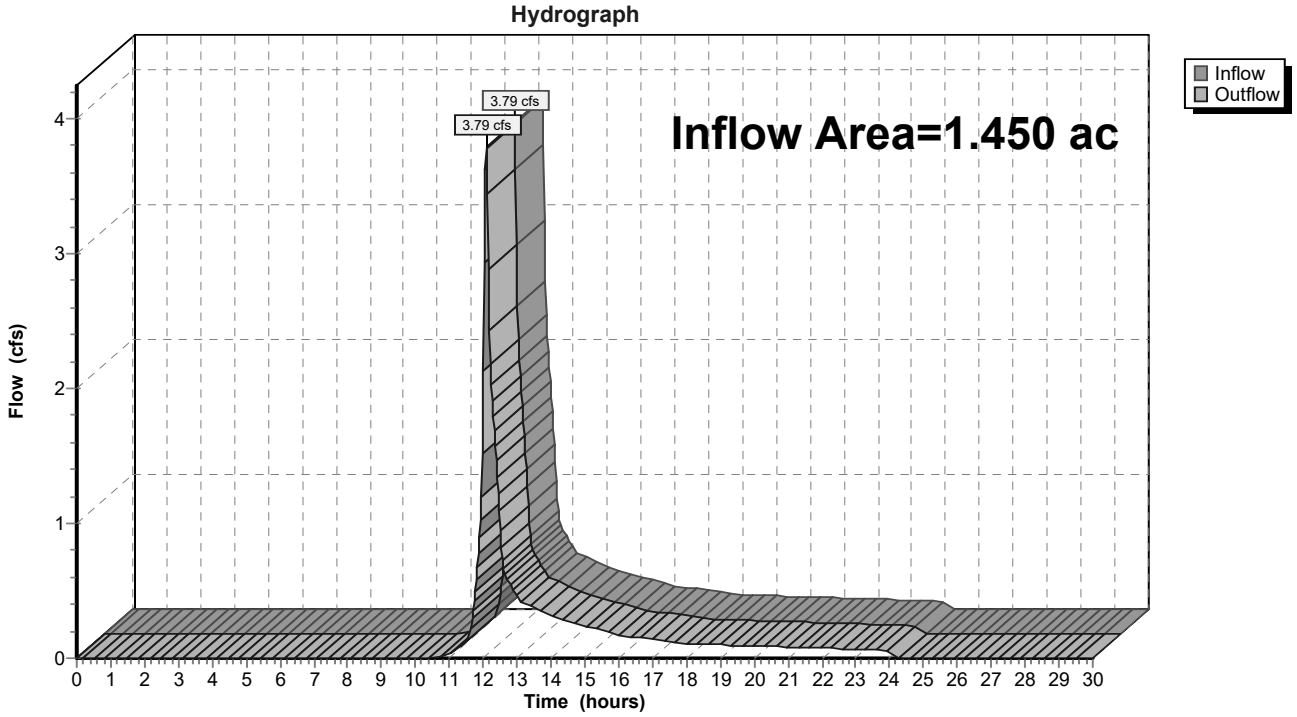


Summary for Reach SP#1: STUDY POINT #1

Inflow Area = 1.450 ac, 26.21% Impervious, Inflow Depth = 2.32" for 100-YR MASHPEE ALTAS event
Inflow = 3.79 cfs @ 12.08 hrs, Volume= 0.280 af
Outflow = 3.79 cfs @ 12.08 hrs, Volume= 0.280 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs / 3

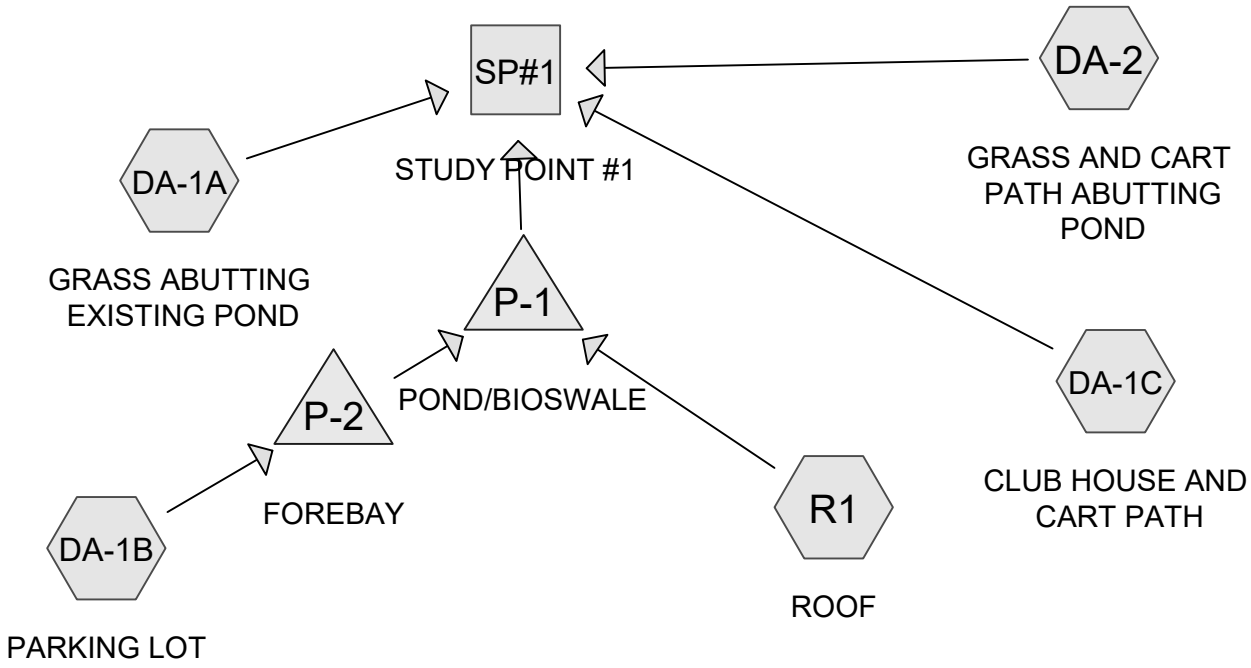
Reach SP#1: STUDY POINT #1



APPENDIX B

POST- DEVELOPMENT WATERSHED

RUNOFF & ROUTING



Subcat Reach Pond Link

Routing Diagram for 2014-009 CLUB RMS PROPOSED WITH FOREBAY CALCS

Prepared by BAXTER-NYE ENGINEERING, Printed 4/14/2020

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.835	39	>75% Grass cover, Good, HSG A (DA-1A, DA-1B, DA-1C, DA-2)
0.300	98	Paved parking, HSG A (DA-1B, DA-2)
0.135	98	Paved roads w/curbs & sewers, HSG A (DA-1A, DA-1C)
0.110	98	Roofs, HSG A (R1)
0.042	30	Woods, Good, HSG A (DA-1B, DA-1C)
1.422	**61**	**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.835	0.000	0.000	0.000	0.000	0.835	>75% Grass cover, Good	DA-1A, DA-1B, DA-1C, DA-2
0.300	0.000	0.000	0.000	0.000	0.300	Paved parking	DA-1B, DA-2
0.135	0.000	0.000	0.000	0.000	0.135	Paved roads w/curbs & sewers	DA-1A, DA-1C
0.110	0.000	0.000	0.000	0.000	0.110	Roofs	R1
0.042	0.000	0.000	0.000	0.000	0.042	Woods, Good	DA-1B, DA-1C
1.422	**0.000**	**0.000**	**0.000**	**0.000**	**1.422**	**TOTAL AREA**	

Summary for Subcatchment DA-1A: GRASS ABUTTING EXISTING POND

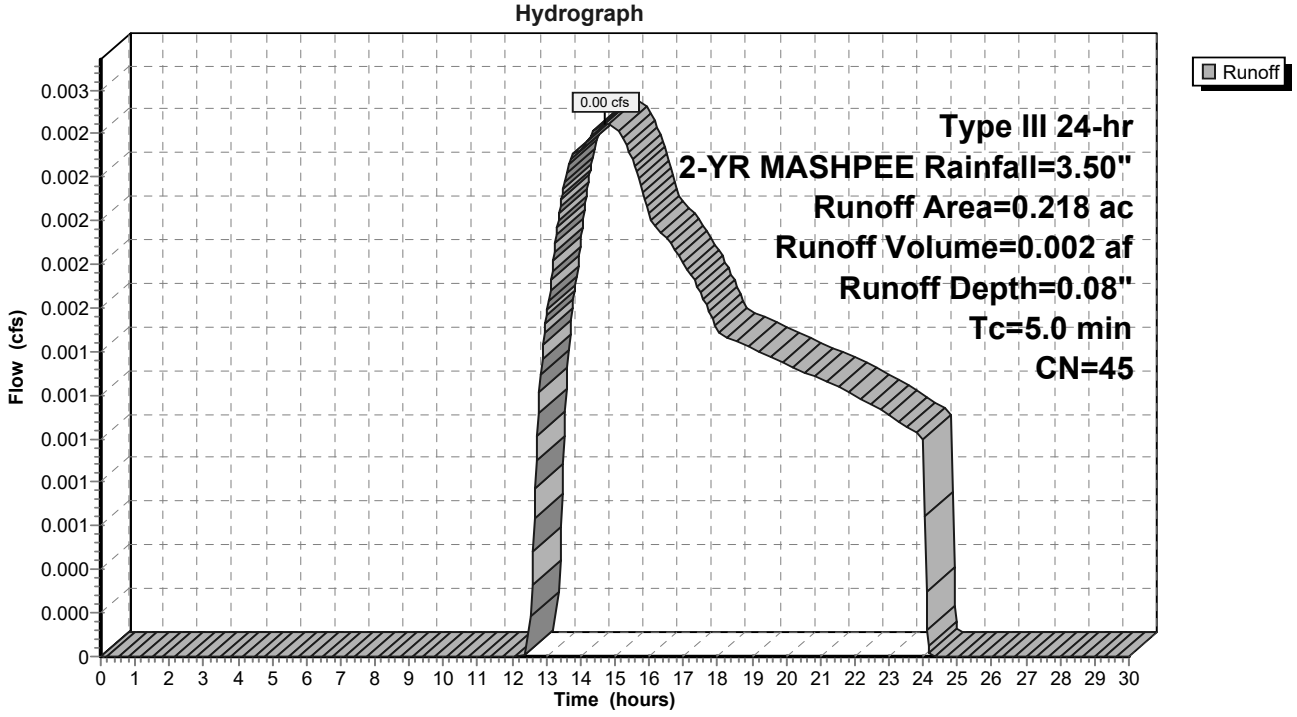
Runoff = 0.00 cfs @ 14.73 hrs, Volume= 0.002 af, Depth= 0.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YR MASHPEE Rainfall=3.50"

Area (ac)	CN	Description
0.194	39	>75% Grass cover, Good, HSG A
0.024	98	Paved roads w/curbs & sewers, HSG A
0.218	45	Weighted Average
0.194		88.99% Pervious Area
0.024		11.01% Impervious Area

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

Subcatchment DA-1A: GRASS ABUTTING EXISTING POND



Summary for Subcatchment DA-1B: PARKING LOT

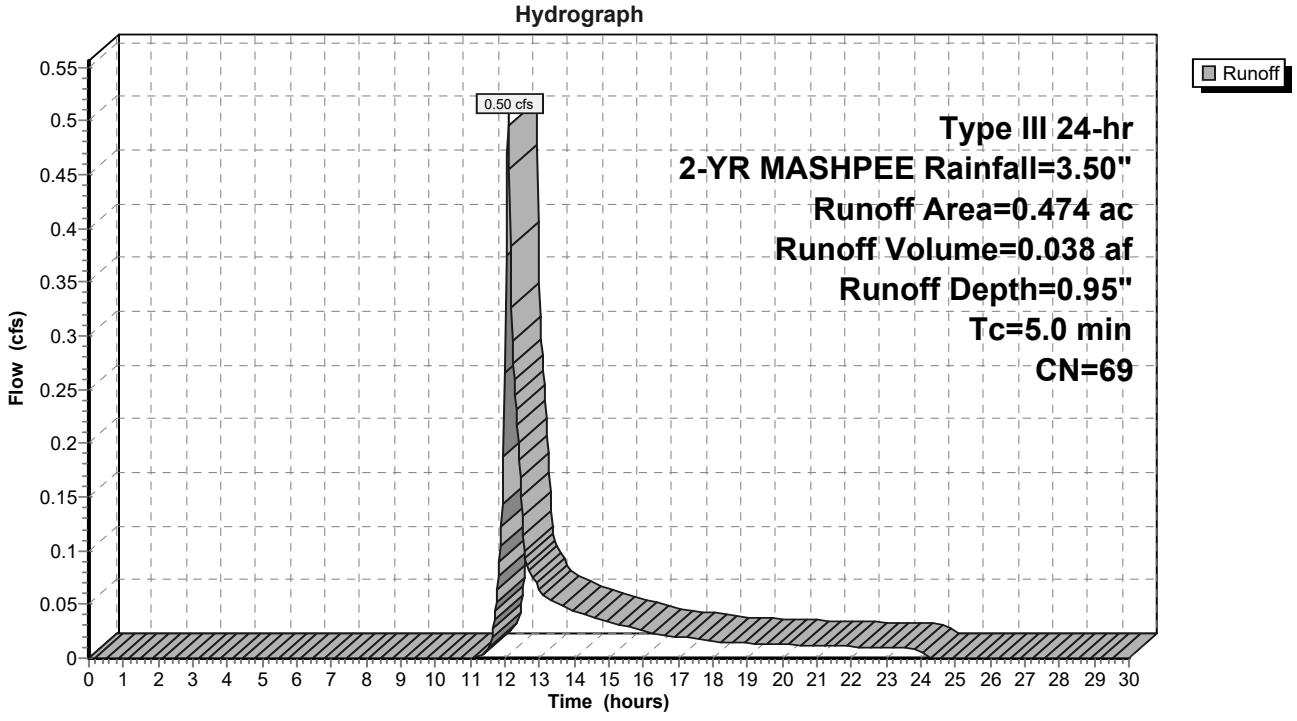
Runoff = 0.50 cfs @ 12.09 hrs, Volume= 0.038 af, Depth= 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YR MASHPEE Rainfall=3.50"

Area (ac)	CN	Description
0.197	39	>75% Grass cover, Good, HSG A
0.028	30	Woods, Good, HSG A
0.249	98	Paved parking, HSG A
0.474	69	Weighted Average
0.225		47.47% Pervious Area
0.249		52.53% Impervious Area

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

Subcatchment DA-1B: PARKING LOT



Summary for Subcatchment DA-1C: CLUB HOUSE AND CART PATH

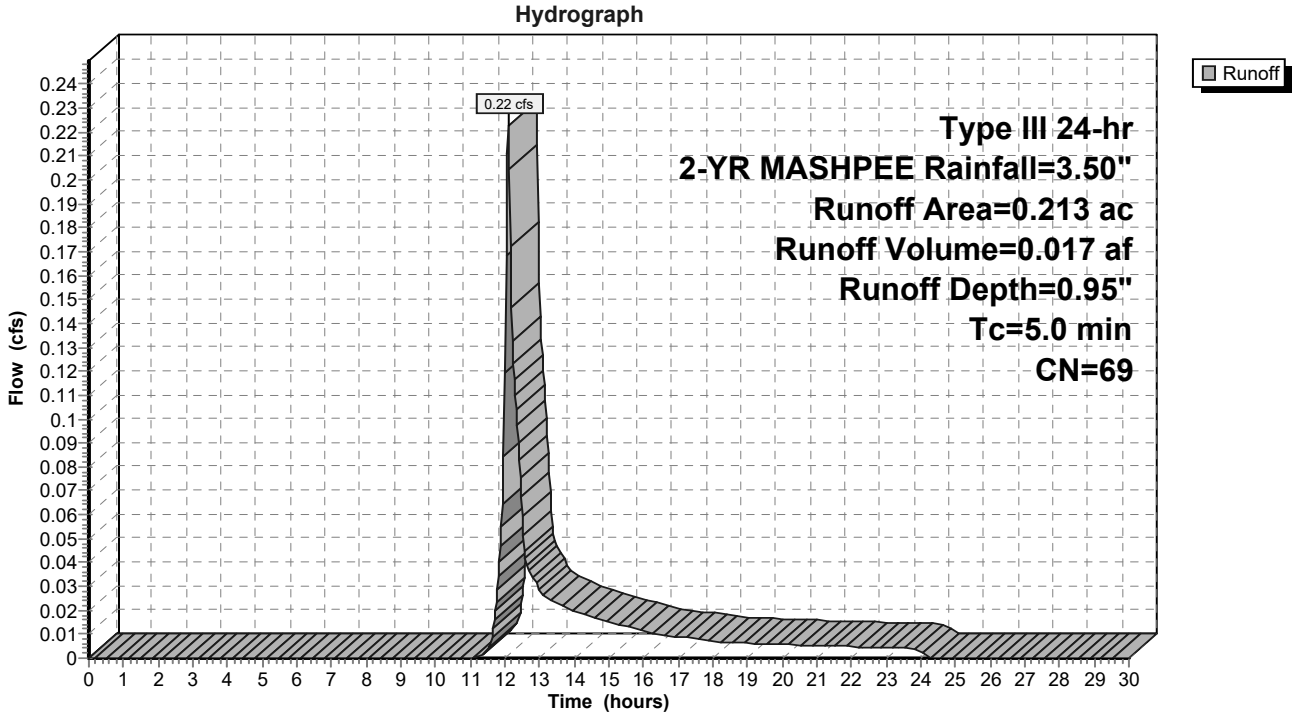
Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YR MASHPEE Rainfall=3.50"

Area (ac)	CN	Description
0.088	39	>75% Grass cover, Good, HSG A
0.014	30	Woods, Good, HSG A
0.111	98	Paved roads w/curbs & sewers, HSG A
0.213	69	Weighted Average
0.102		47.89% Pervious Area
0.111		52.11% Impervious Area

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

Subcatchment DA-1C: CLUB HOUSE AND CART PATH



Summary for Subcatchment DA-2: GRASS AND CART PATH ABUTTING POND

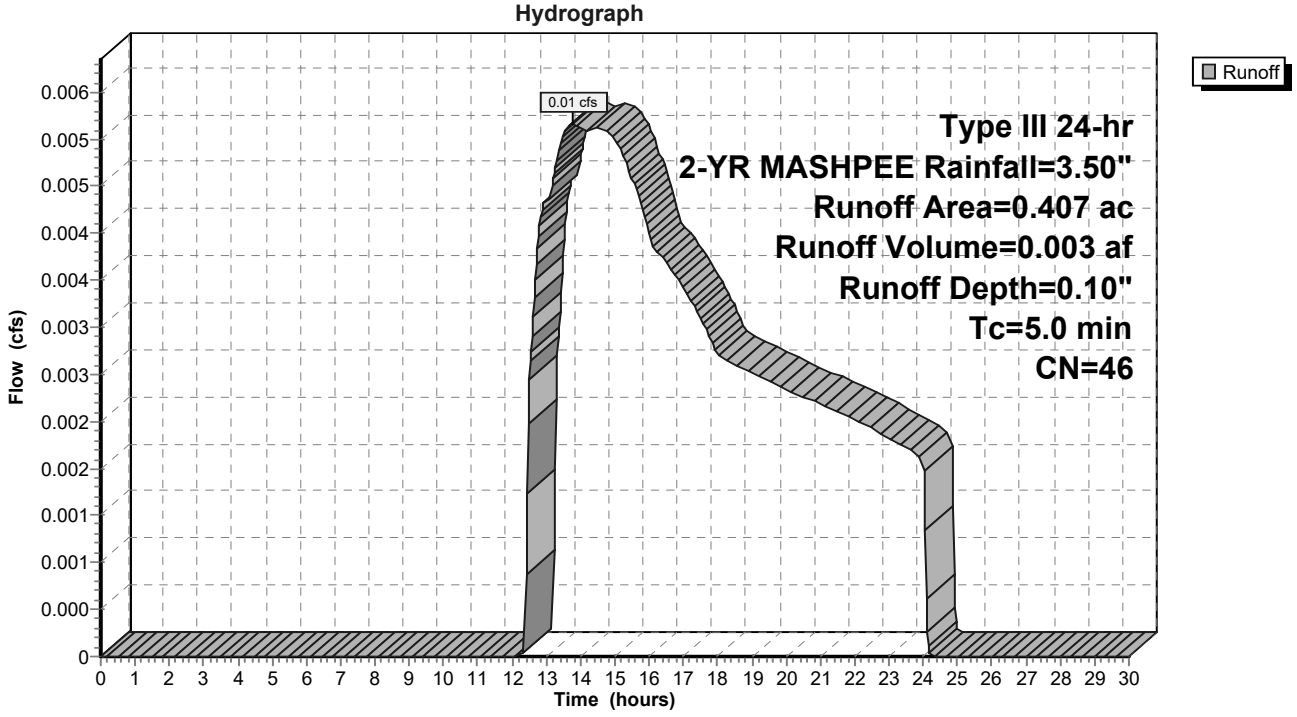
Runoff = 0.01 cfs @ 13.77 hrs, Volume= 0.003 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YR MASHPEE Rainfall=3.50"

Area (ac)	CN	Description
0.356	39	>75% Grass cover, Good, HSG A
0.051	98	Paved parking, HSG A
0.407	46	Weighted Average
0.356		87.47% Pervious Area
0.051		12.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, L1**

Subcatchment DA-2: GRASS AND CART PATH ABUTTING POND



Summary for Subcatchment R1: ROOF

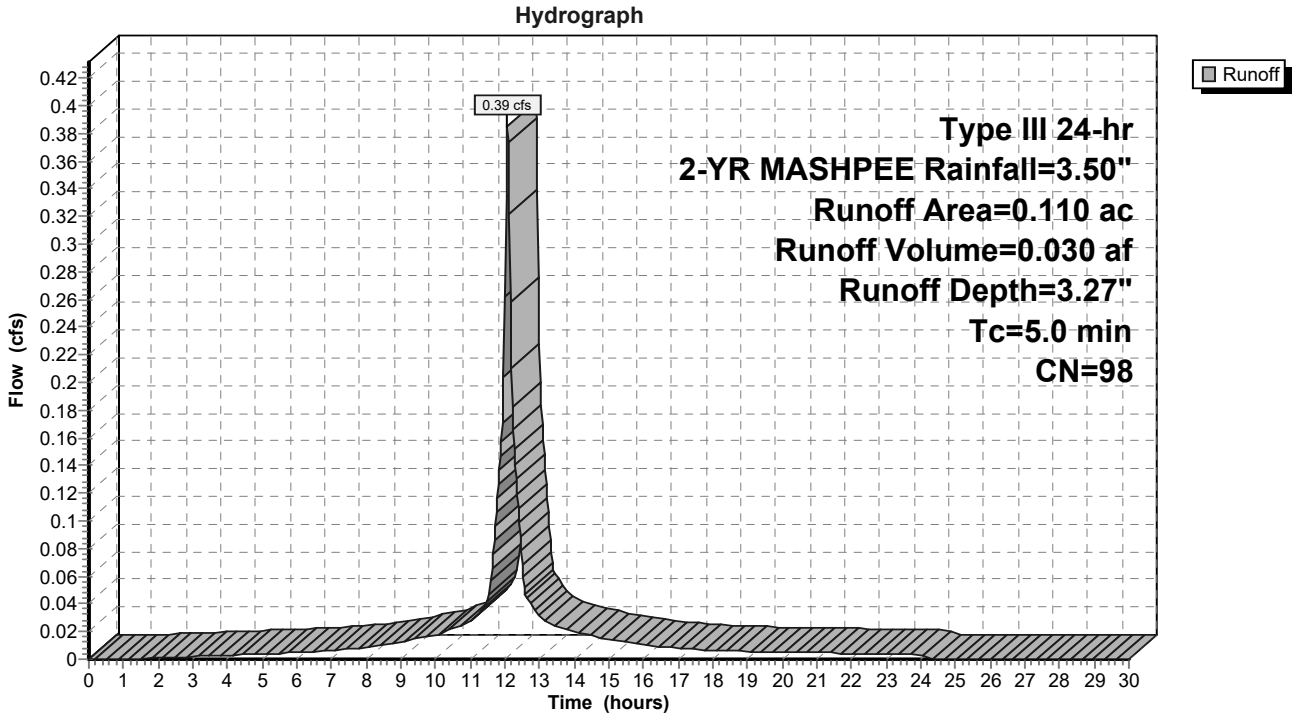
Runoff = 0.39 cfs @ 12.07 hrs, Volume= 0.030 af, Depth= 3.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YR MASHPEE Rainfall=3.50"

Area (ac)	CN	Description
0.110	98	Roofs, HSG A
0.110		100.00% Impervious Area

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

Subcatchment R1: ROOF

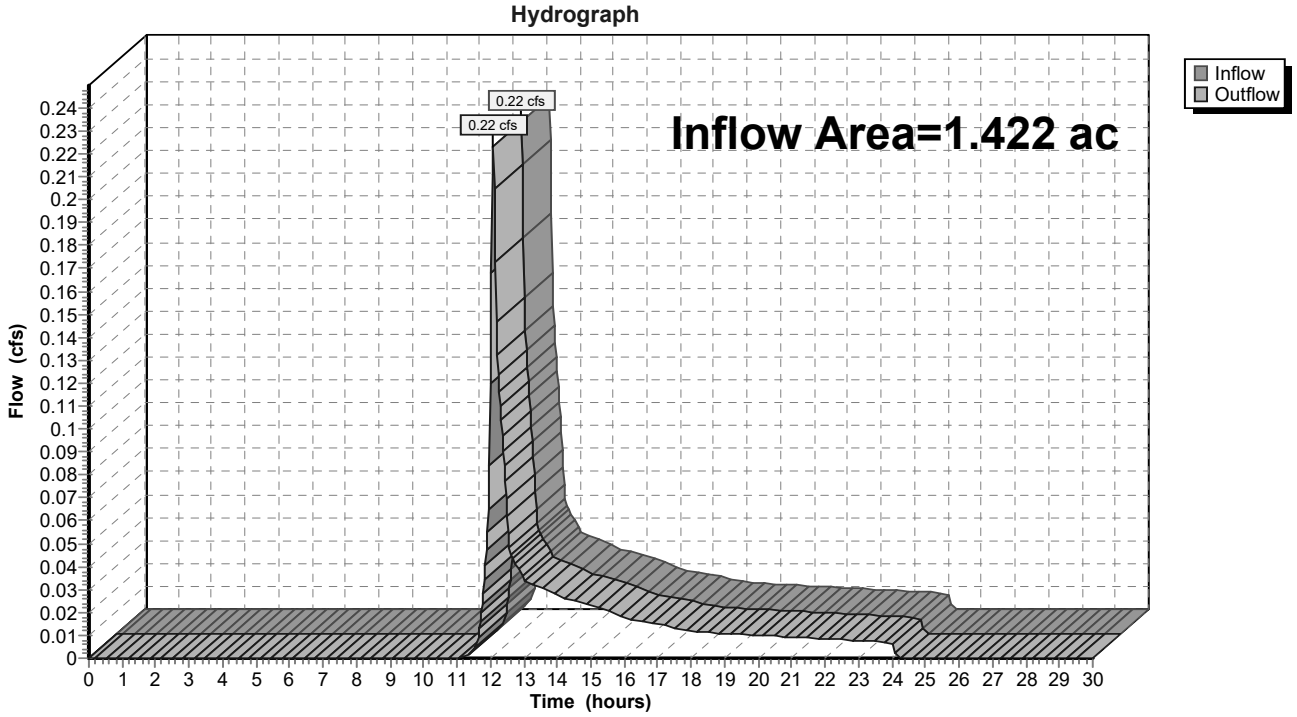


Summary for Reach SP#1: STUDY POINT #1

Inflow Area = 1.422 ac, 38.33% Impervious, Inflow Depth = 0.19" for 2-YR MASHPEE event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.022 af
Outflow = 0.22 cfs @ 12.09 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs / 3

Reach SP#1: STUDY POINT #1



Summary for Pond P-1: POND/BIOSWALE

Inflow Area = 0.584 ac, 61.47% Impervious, Inflow Depth = 0.98" for 2-YR MASHPEE event
Inflow = 0.75 cfs @ 12.13 hrs, Volume= 0.048 af
Outflow = 0.07 cfs @ 13.07 hrs, Volume= 0.048 af, Atten= 90%, Lag= 56.3 min
Discarded = 0.07 cfs @ 13.07 hrs, Volume= 0.048 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs / 3
Peak Elev= 17.25' @ 13.07 hrs Surf.Area= 1,304 sf Storage= 798 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 98.6 min (863.5 - 764.9)

Volume	Invert	Avail.Storage	Storage Description
#1	16.50'	4,156 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

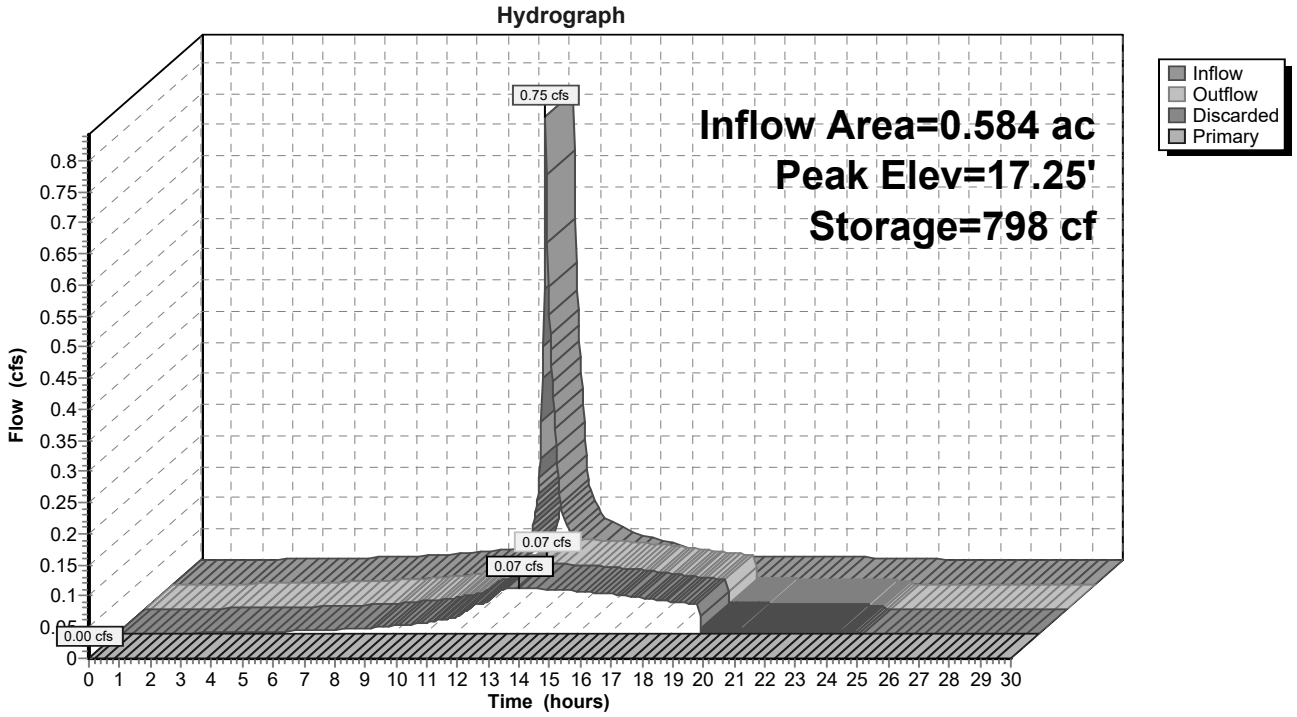
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
16.50	831	207.0	0	0	831
17.00	1,150	217.0	493	493	1,185
18.00	1,829	236.0	1,476	1,970	1,906
19.00	2,564	255.0	2,186	4,156	2,688

Device	Routing	Invert	Outlet Devices
#1	Discarded	16.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	18.00'	**5.0' long x 9.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69

Discarded OutFlow Max=0.07 cfs @ 13.07 hrs HW=17.25' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=16.50' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-1: POND/BIOSWALE



Summary for Pond P-2: FOREBAY

Inflow Area = 0.474 ac, 52.53% Impervious, Inflow Depth = 0.95" for 2-YR MASHPEE event
Inflow = 0.50 cfs @ 12.09 hrs, Volume= 0.038 af
Outflow = 0.47 cfs @ 12.13 hrs, Volume= 0.038 af, Atten= 5%, Lag= 2.8 min
Discarded = 0.02 cfs @ 12.13 hrs, Volume= 0.020 af
Primary = 0.45 cfs @ 12.13 hrs, Volume= 0.018 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs / 3
Peak Elev= 17.61' @ 12.13 hrs Surf.Area= 334 sf Storage= 254 cf

Plug-Flow detention time= 95.9 min calculated for 0.038 af (100% of inflow)
Center-of-Mass det. time= 96.0 min (967.7 - 871.7)

Volume	Invert	Avail.Storage	Storage Description
#1	16.50'	640 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

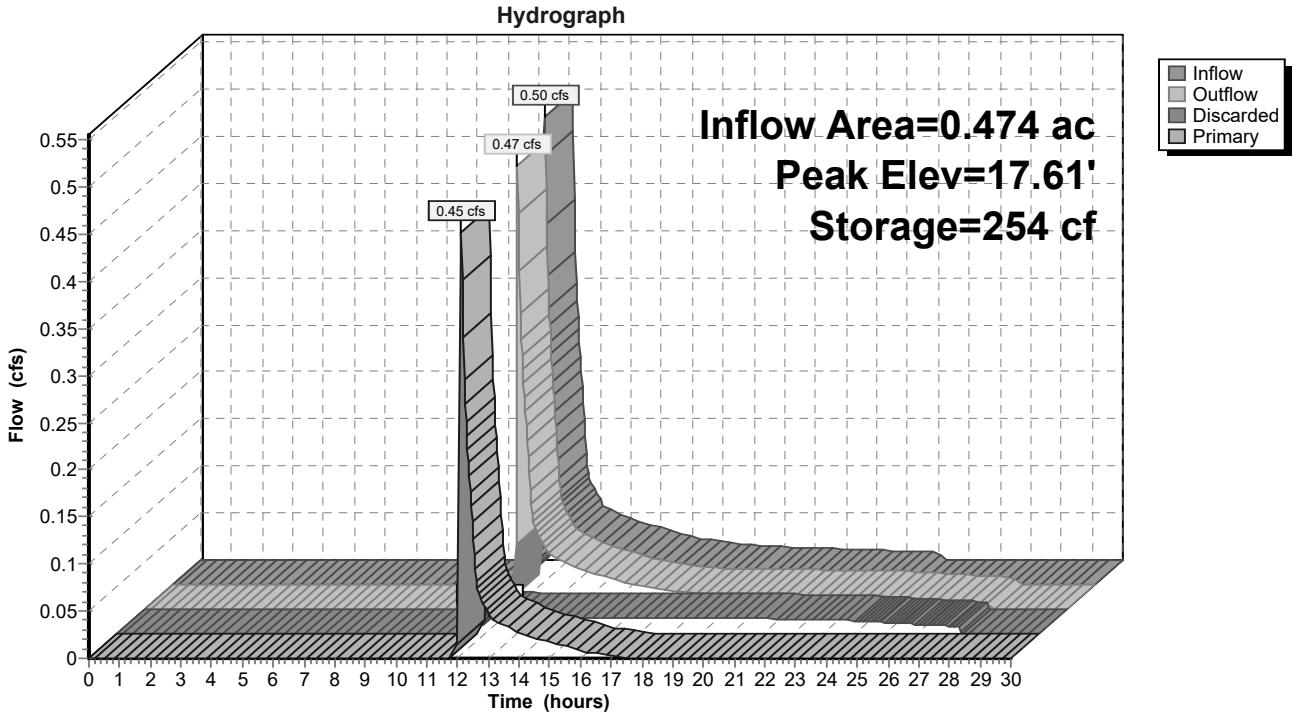
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
16.50	136	47.0	0	0	136
17.00	215	58.0	87	87	232
17.50	310	68.0	131	218	337
18.00	420	79.0	182	399	471
18.50	547	89.0	241	640	611

Device	Routing	Invert	Outlet Devices
#1	Discarded	16.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	17.50'	**5.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.02 cfs @ 12.13 hrs HW=17.61' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.41 cfs @ 12.13 hrs HW=17.61' TW=16.83' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Weir Controls 0.41 cfs @ 0.77 fps)

Pond P-2: FOREBAY



Summary for Subcatchment DA-1A: GRASS ABUTTING EXISTING POND

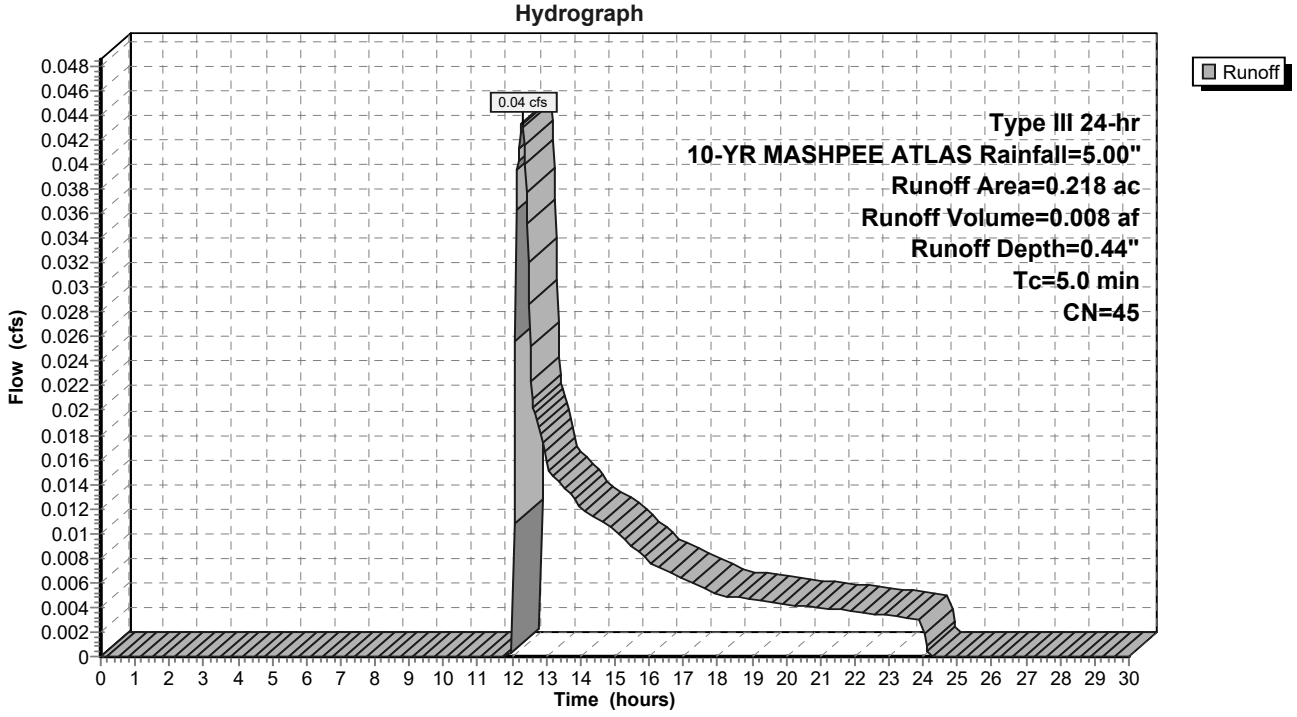
Runoff = 0.04 cfs @ 12.29 hrs, Volume= 0.008 af, Depth= 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YR MASHPEE ATLAS Rainfall=5.00"

Area (ac)	CN	Description
0.194	39	>75% Grass cover, Good, HSG A
0.024	98	Paved roads w/curbs & sewers, HSG A
0.218	45	Weighted Average
0.194		88.99% Pervious Area
0.024		11.01% Impervious Area

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

Subcatchment DA-1A: GRASS ABUTTING EXISTING POND



Summary for Subcatchment DA-1B: PARKING LOT

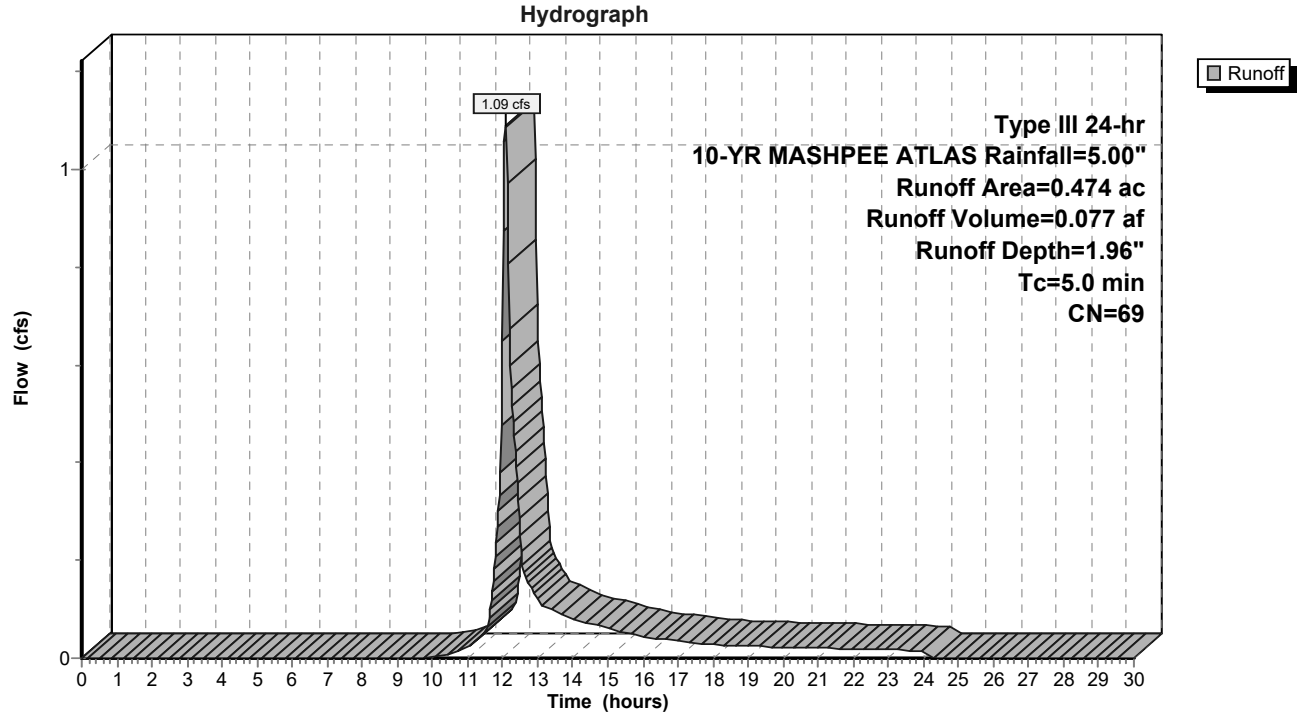
Runoff = 1.09 cfs @ 12.08 hrs, Volume= 0.077 af, Depth= 1.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YR MASHPEE ATLAS Rainfall=5.00"

Area (ac)	CN	Description
0.197	39	>75% Grass cover, Good, HSG A
0.028	30	Woods, Good, HSG A
0.249	98	Paved parking, HSG A
0.474	69	Weighted Average
0.225		47.47% Pervious Area
0.249		52.53% Impervious Area

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

Subcatchment DA-1B: PARKING LOT



Summary for Subcatchment DA-1C: CLUB HOUSE AND CART PATH

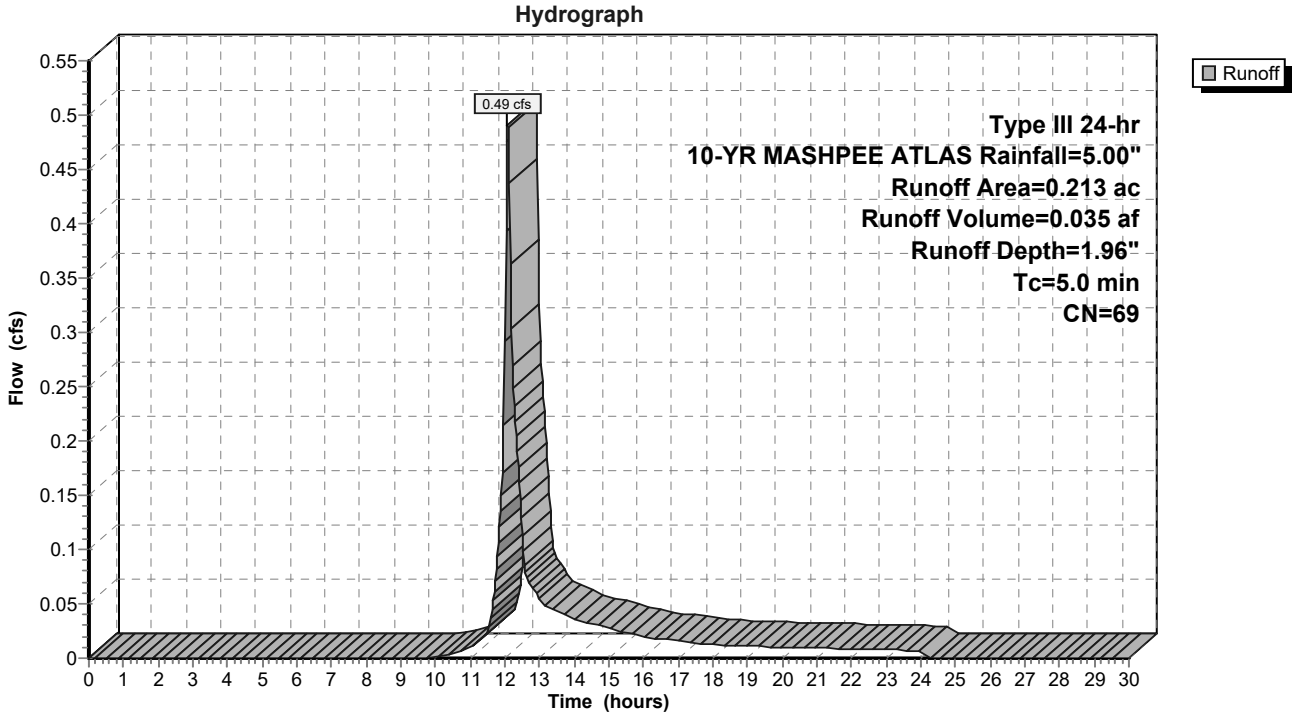
Runoff = 0.49 cfs @ 12.08 hrs, Volume= 0.035 af, Depth= 1.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YR MASHPEE ATLAS Rainfall=5.00"

Area (ac)	CN	Description
0.088	39	>75% Grass cover, Good, HSG A
0.014	30	Woods, Good, HSG A
0.111	98	Paved roads w/curbs & sewers, HSG A
0.213	69	Weighted Average
0.102		47.89% Pervious Area
0.111		52.11% Impervious Area

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

Subcatchment DA-1C: CLUB HOUSE AND CART PATH



Summary for Subcatchment DA-2: GRASS AND CART PATH ABUTTING POND

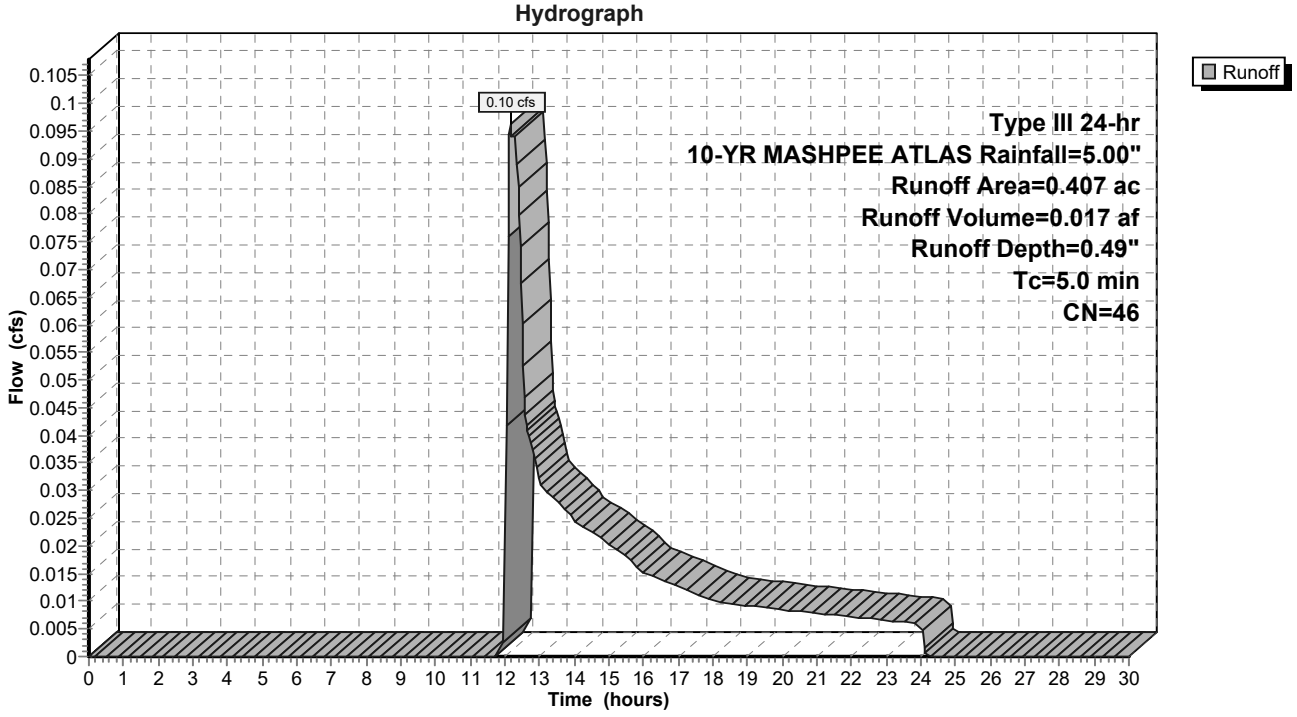
Runoff = 0.10 cfs @ 12.15 hrs, Volume= 0.017 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YR MASHPEE ATLAS Rainfall=5.00"

Area (ac)	CN	Description
0.356	39	>75% Grass cover, Good, HSG A
0.051	98	Paved parking, HSG A
0.407	46	Weighted Average
0.356		87.47% Pervious Area
0.051		12.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, L1**

Subcatchment DA-2: GRASS AND CART PATH ABUTTING POND



Summary for Subcatchment R1: ROOF

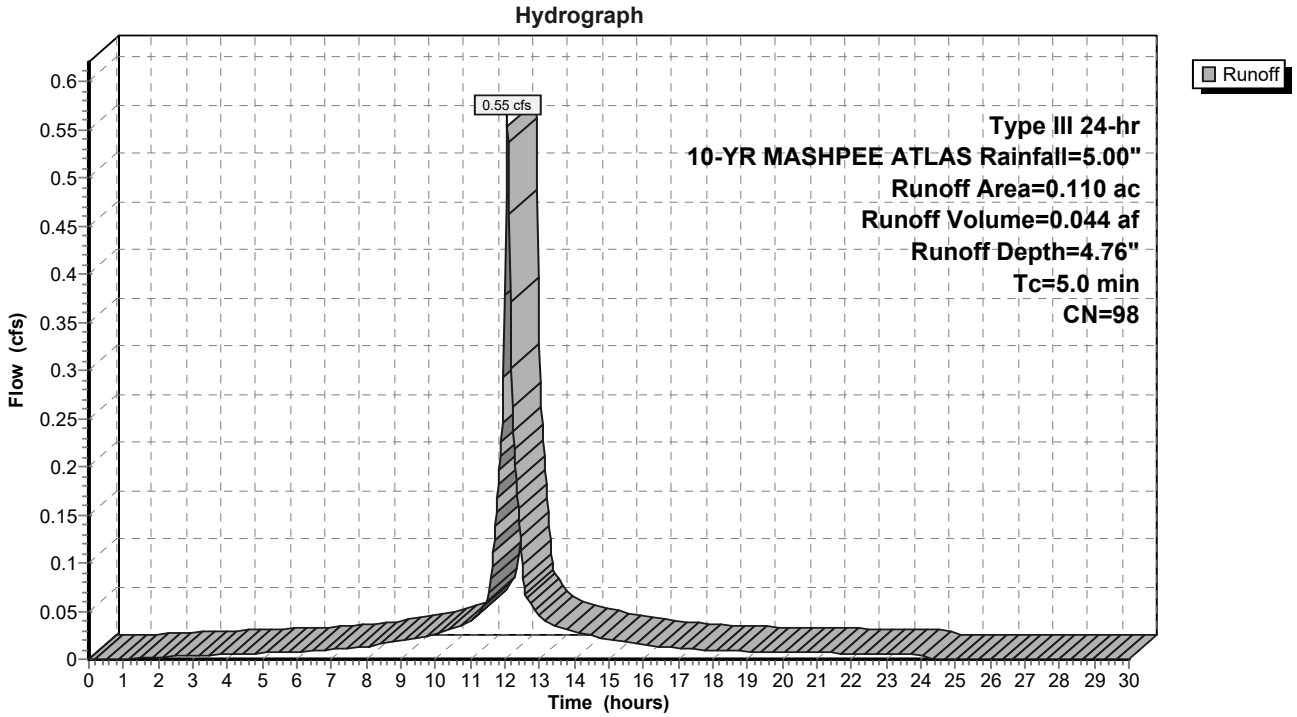
Runoff = 0.55 cfs @ 12.07 hrs, Volume= 0.044 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YR MASHPEE ATLAS Rainfall=5.00"

Area (ac)	CN	Description
0.110	98	Roofs, HSG A
0.110		100.00% Impervious Area

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

Subcatchment R1: ROOF

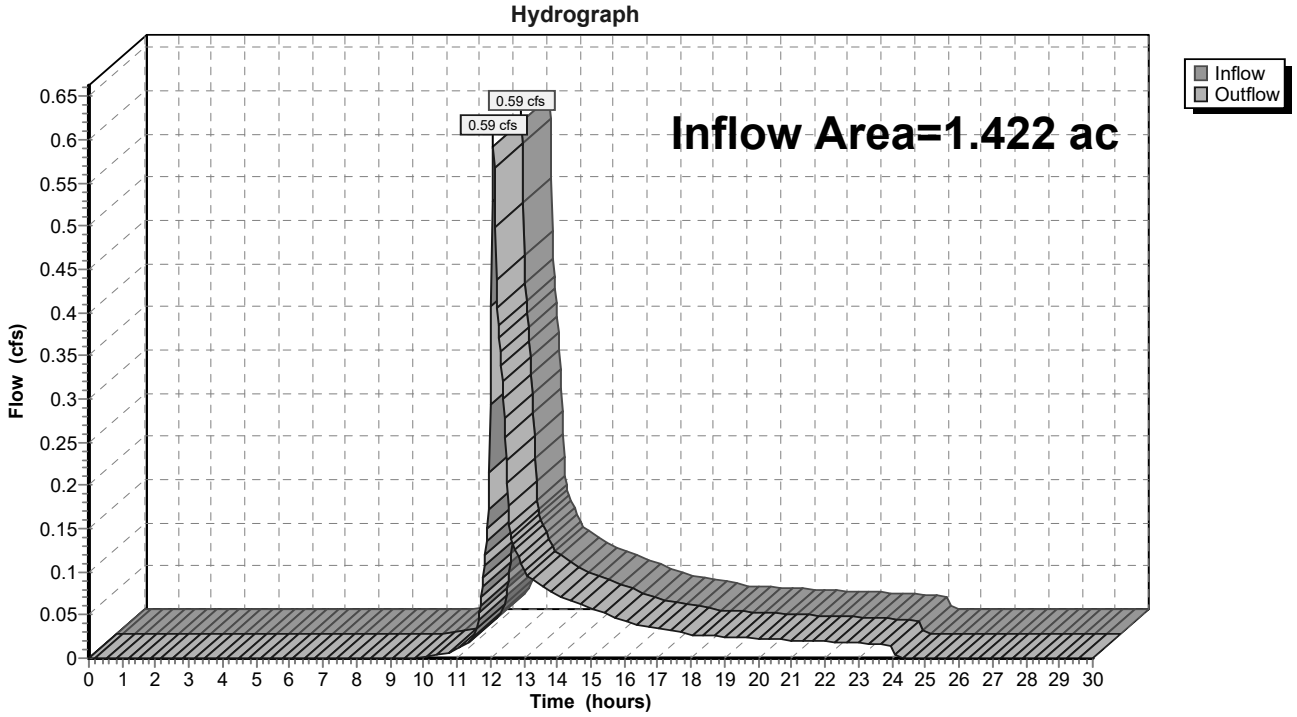


Summary for Reach SP#1: STUDY POINT #1

Inflow Area = 1.422 ac, 38.33% Impervious, Inflow Depth = 0.50" for 10-YR MASHPEE ATLAS event
Inflow = 0.59 cfs @ 12.10 hrs, Volume= 0.059 af
Outflow = 0.59 cfs @ 12.10 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs / 3

Reach SP#1: STUDY POINT #1



Summary for Pond P-1: POND/BIOSWALE

Inflow Area = 0.584 ac, 61.47% Impervious, Inflow Depth = 1.96" for 10-YR MASHPEE ATLAS event
Inflow = 1.60 cfs @ 12.09 hrs, Volume= 0.095 af
Outflow = 0.10 cfs @ 13.68 hrs, Volume= 0.095 af, Atten= 94%, Lag= 95.3 min
Discarded = 0.10 cfs @ 13.68 hrs, Volume= 0.095 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs / 3
Peak Elev= 17.95' @ 13.68 hrs Surf.Area= 1,793 sf Storage= 1,883 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 200.9 min (982.5 - 781.6)

Volume	Invert	Avail.Storage	Storage Description
#1	16.50'	4,156 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

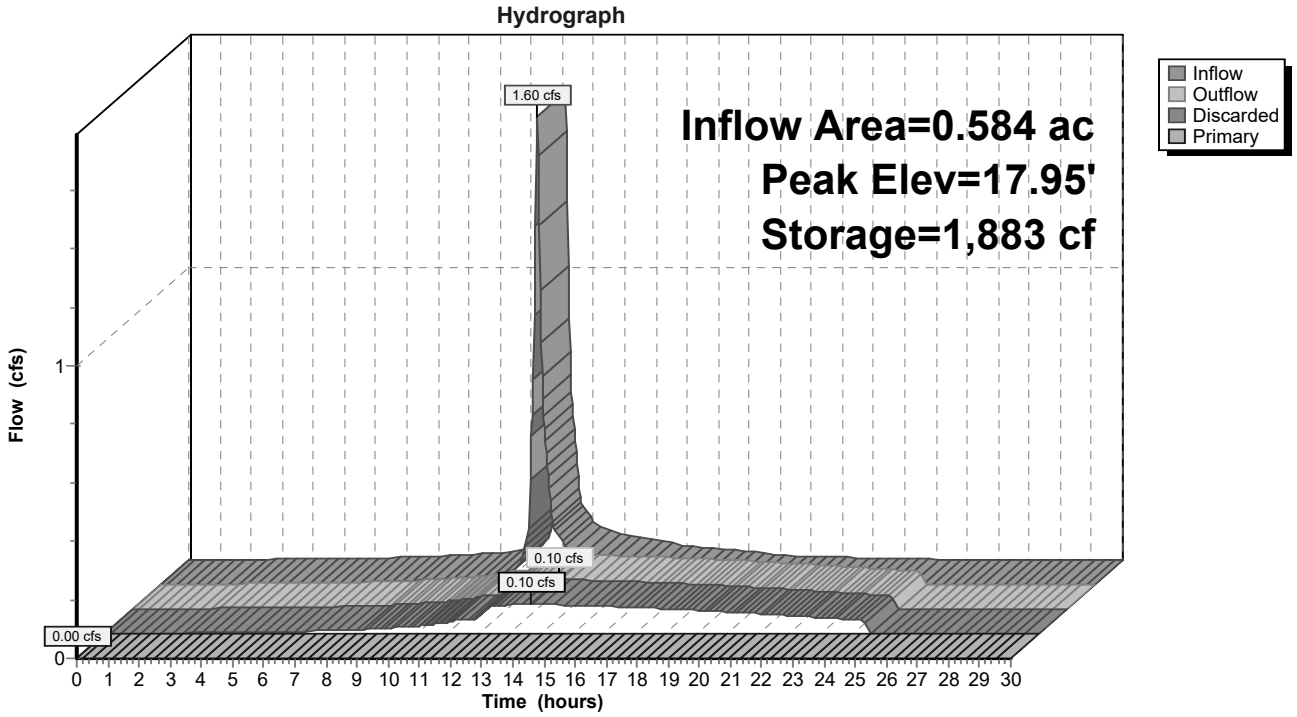
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
16.50	831	207.0	0	0	831
17.00	1,150	217.0	493	493	1,185
18.00	1,829	236.0	1,476	1,970	1,906
19.00	2,564	255.0	2,186	4,156	2,688

Device	Routing	Invert	Outlet Devices
#1	Discarded	16.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	18.00'	**5.0' long x 9.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69

Discarded OutFlow Max=0.10 cfs @ 13.68 hrs HW=17.95' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=16.50' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-1: POND/BIOSWALE



Summary for Pond P-2: FOREBAY

Inflow Area = 0.474 ac, 52.53% Impervious, Inflow Depth = 1.96" for 10-YR MASHPEE ATLAS event
Inflow = 1.09 cfs @ 12.08 hrs, Volume= 0.077 af
Outflow = 1.08 cfs @ 12.09 hrs, Volume= 0.077 af, Atten= 1%, Lag= 0.8 min
Discarded = 0.02 cfs @ 13.68 hrs, Volume= 0.026 af
Primary = 1.06 cfs @ 12.09 hrs, Volume= 0.052 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs / 3
Peak Elev= 17.95' @ 13.68 hrs Surf.Area= 409 sf Storage= 380 cf

Plug-Flow detention time= 68.9 min calculated for 0.077 af (100% of inflow)
Center-of-Mass det. time= 69.1 min (918.4 - 849.3)

Volume	Invert	Avail.Storage	Storage Description
#1	16.50'	640 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

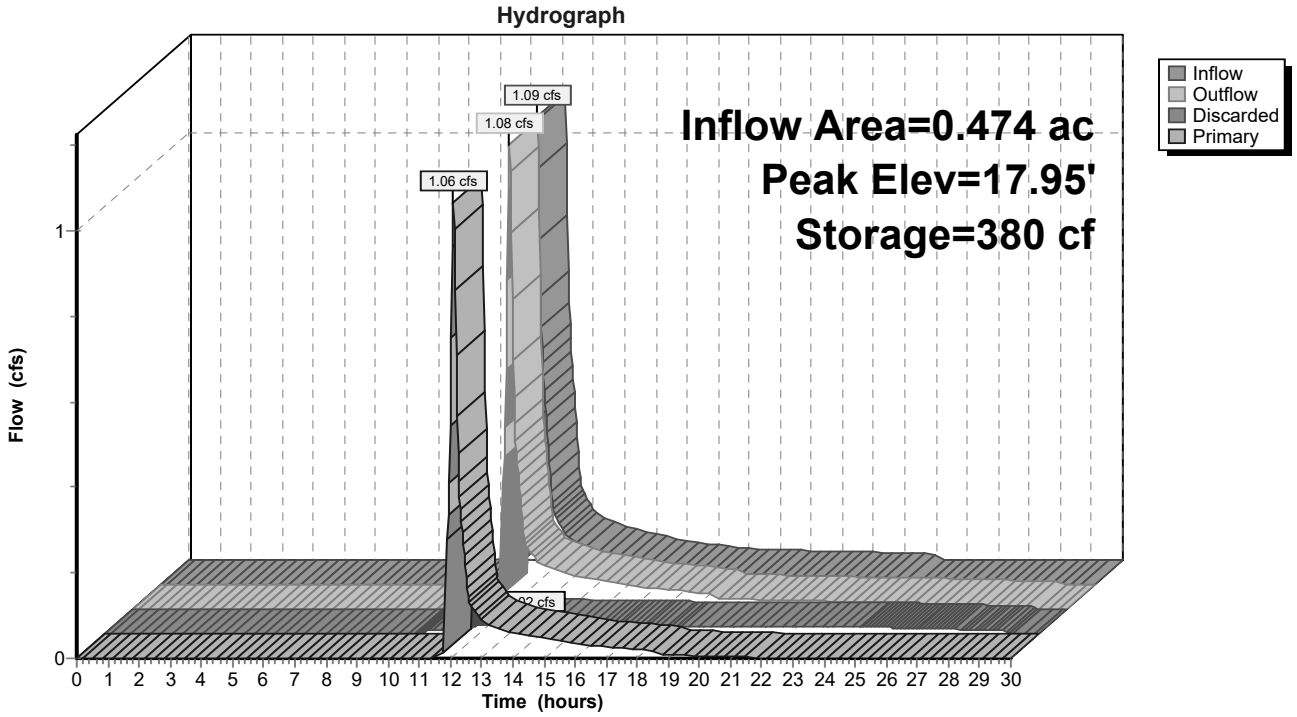
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
16.50	136	47.0	0	0	136
17.00	215	58.0	87	87	232
17.50	310	68.0	131	218	337
18.00	420	79.0	182	399	471
18.50	547	89.0	241	640	611

Device	Routing	Invert	Outlet Devices
#1	Discarded	16.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	17.50'	**5.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.02 cfs @ 13.68 hrs HW=17.95' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.05 cfs @ 12.09 hrs HW=17.70' TW=17.24' (Dynamic Tailwater)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 1.05 cfs @ 1.06 fps)

Pond P-2: FOREBAY



Summary for Subcatchment DA-1A: GRASS ABUTTING EXISTING POND

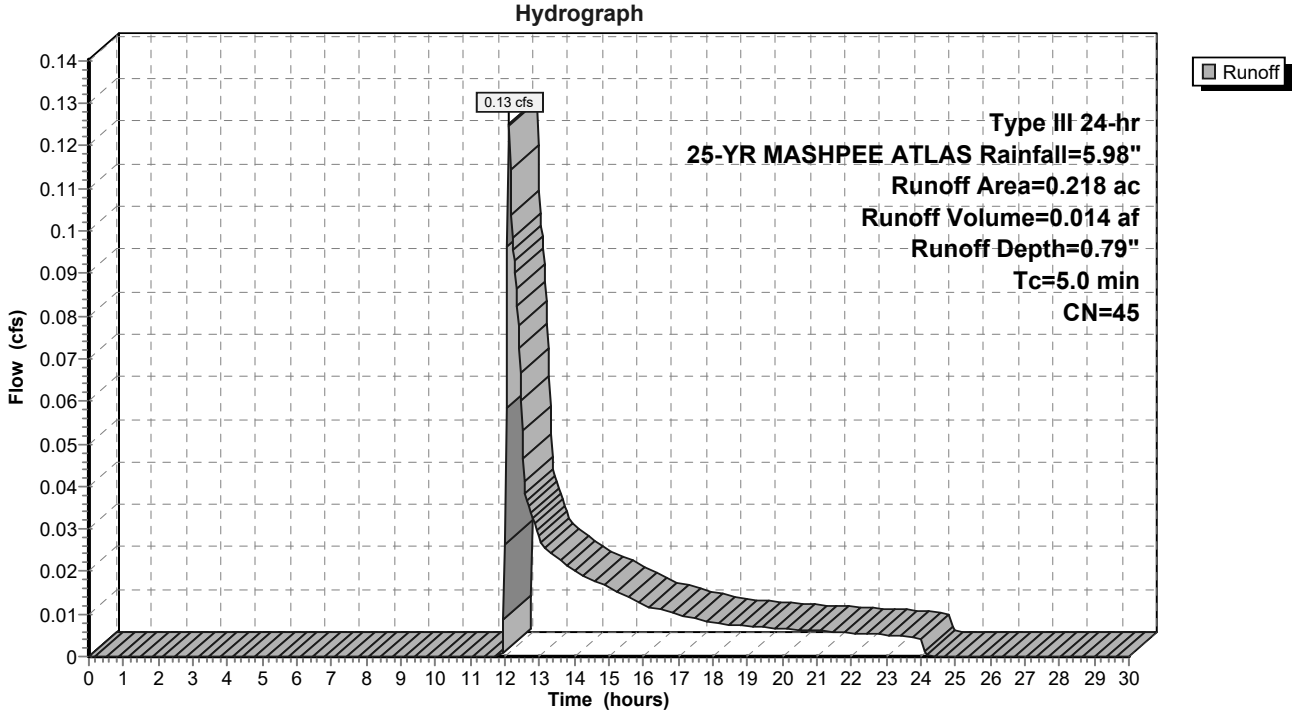
Runoff = 0.13 cfs @ 12.11 hrs, Volume= 0.014 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YR MASHPEE ATLAS Rainfall=5.98"

Area (ac)	CN	Description
0.194	39	>75% Grass cover, Good, HSG A
0.024	98	Paved roads w/curbs & sewers, HSG A
0.218	45	Weighted Average
0.194		88.99% Pervious Area
0.024		11.01% Impervious Area

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

Subcatchment DA-1A: GRASS ABUTTING EXISTING POND



Summary for Subcatchment DA-1B: PARKING LOT

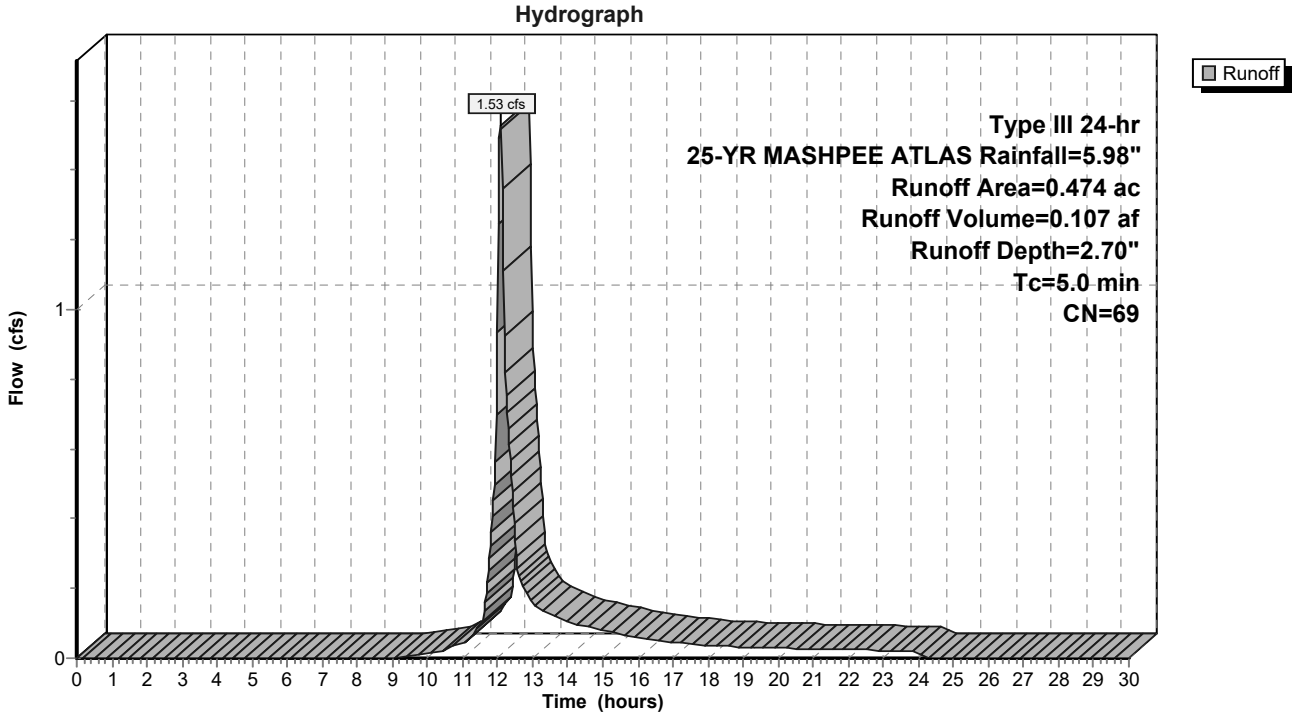
Runoff = 1.53 cfs @ 12.08 hrs, Volume= 0.107 af, Depth= 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YR MASHPEE ATLAS Rainfall=5.98"

Area (ac)	CN	Description
0.197	39	>75% Grass cover, Good, HSG A
0.028	30	Woods, Good, HSG A
0.249	98	Paved parking, HSG A
0.474	69	Weighted Average
0.225		47.47% Pervious Area
0.249		52.53% Impervious Area

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

Subcatchment DA-1B: PARKING LOT



Summary for Subcatchment DA-1C: CLUB HOUSE AND CART PATH

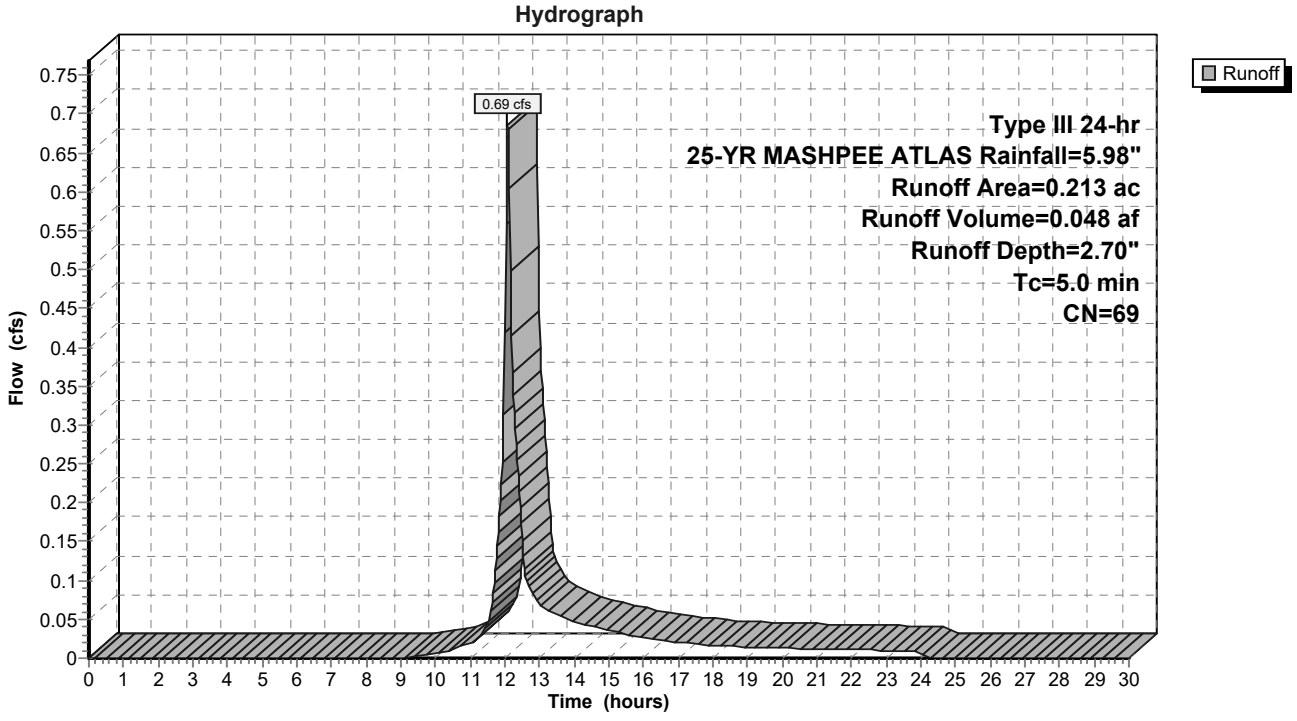
Runoff = 0.69 cfs @ 12.08 hrs, Volume= 0.048 af, Depth= 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YR MASHPEE ATLAS Rainfall=5.98"

Area (ac)	CN	Description
0.088	39	>75% Grass cover, Good, HSG A
0.014	30	Woods, Good, HSG A
0.111	98	Paved roads w/curbs & sewers, HSG A
0.213	69	Weighted Average
0.102		47.89% Pervious Area
0.111		52.11% Impervious Area

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

Subcatchment DA-1C: CLUB HOUSE AND CART PATH



Summary for Subcatchment DA-2: GRASS AND CART PATH ABUTTING POND

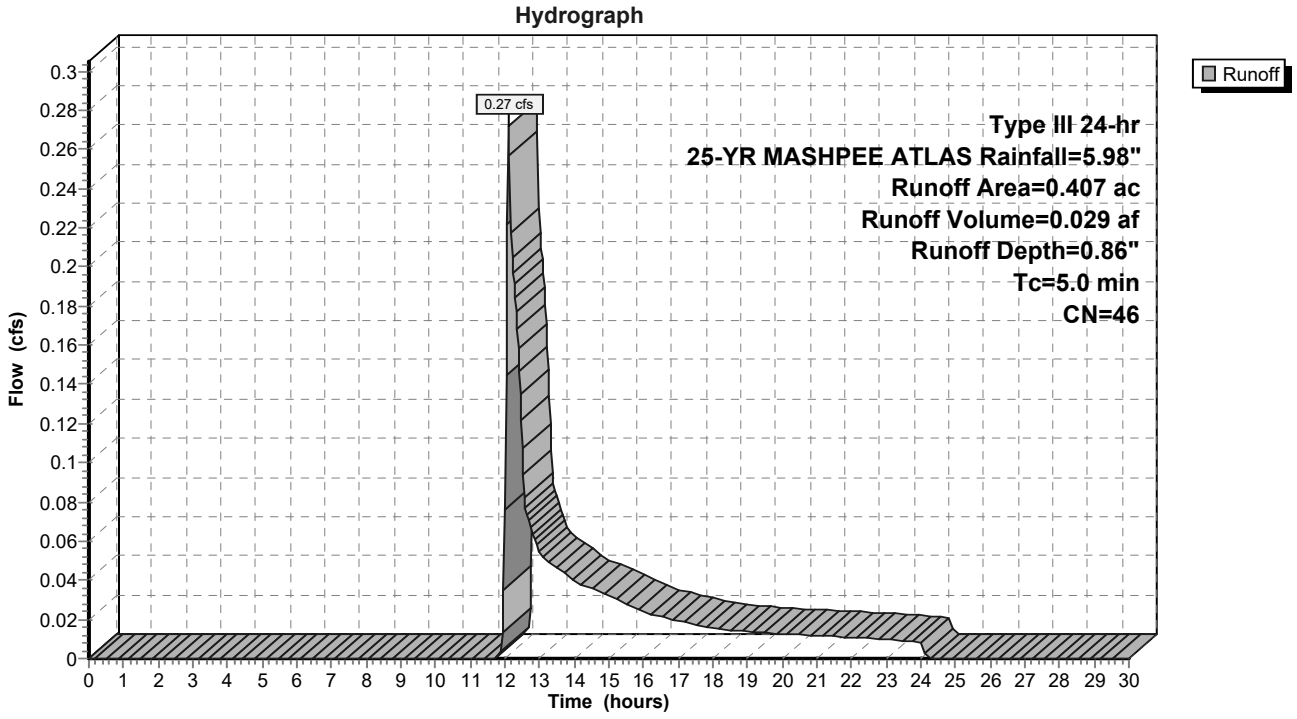
Runoff = 0.27 cfs @ 12.11 hrs, Volume= 0.029 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YR MASHPEE ATLAS Rainfall=5.98"

Area (ac)	CN	Description
0.356	39	>75% Grass cover, Good, HSG A
0.051	98	Paved parking, HSG A
0.407	46	Weighted Average
0.356		87.47% Pervious Area
0.051		12.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, L1**

Subcatchment DA-2: GRASS AND CART PATH ABUTTING POND



Summary for Subcatchment R1: ROOF

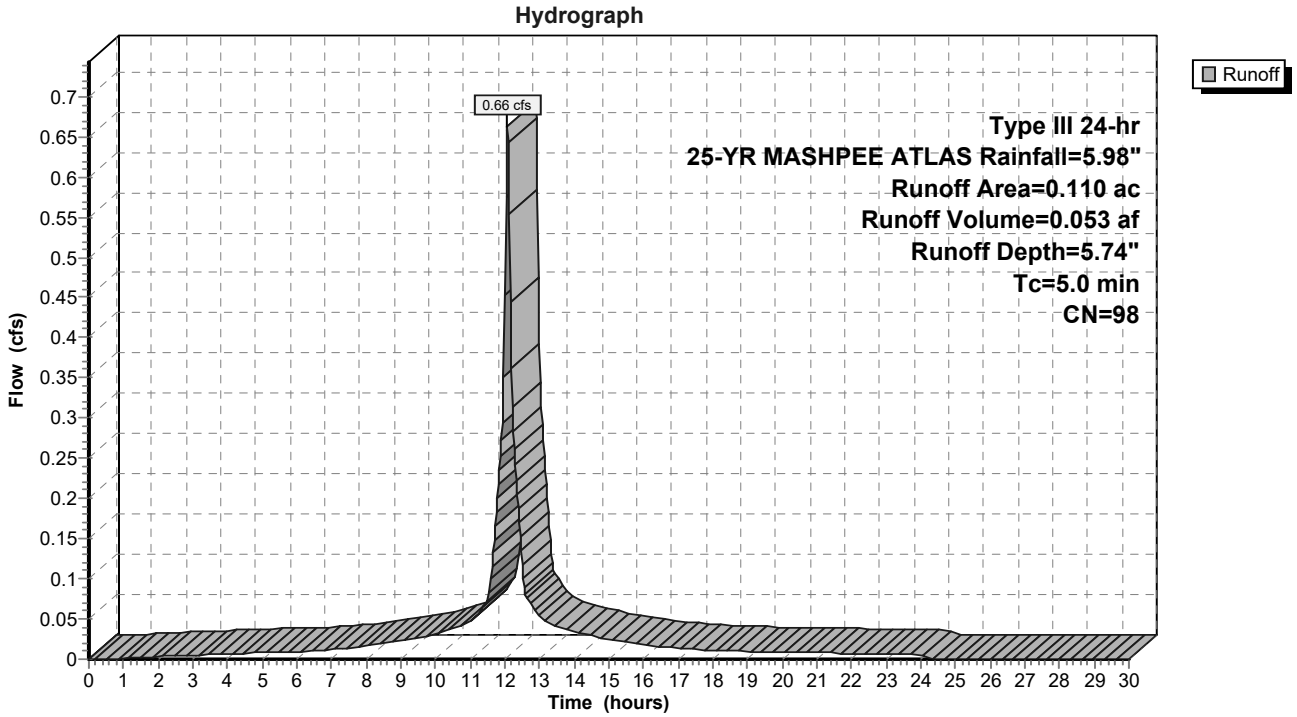
Runoff = 0.66 cfs @ 12.07 hrs, Volume= 0.053 af, Depth= 5.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YR MASHPEE ATLAS Rainfall=5.98"

Area (ac)	CN	Description
0.110	98	Roofs, HSG A
0.110		100.00% Impervious Area

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

Subcatchment R1: ROOF

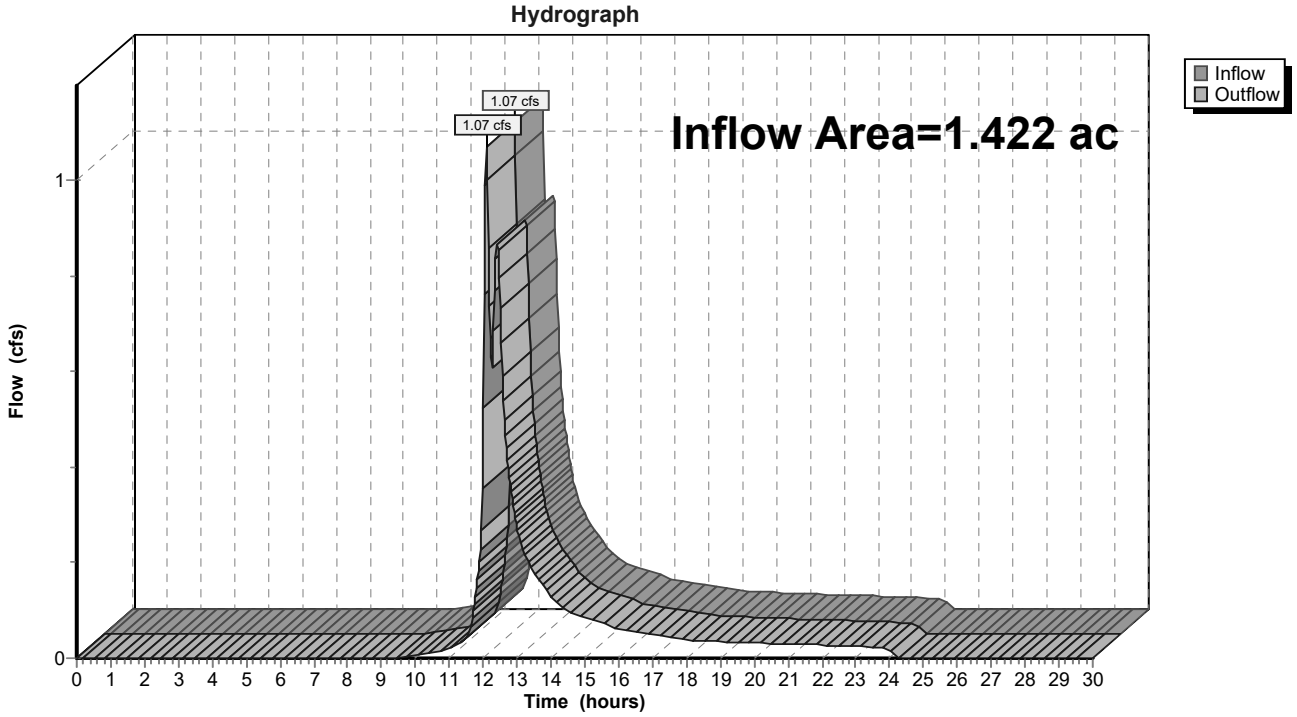


Summary for Reach SP#1: STUDY POINT #1

Inflow Area = 1.422 ac, 38.33% Impervious, Inflow Depth = 0.95" for 25-YR MASHPEE ATLAS event
Inflow = 1.07 cfs @ 12.09 hrs, Volume= 0.113 af
Outflow = 1.07 cfs @ 12.09 hrs, Volume= 0.113 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs / 3

Reach SP#1: STUDY POINT #1



Summary for Pond P-1: POND/BIOSWALE

Inflow Area = 0.584 ac, 61.47% Impervious, Inflow Depth = 2.70" for 25-YR MASHPEE ATLAS event
Inflow = 2.13 cfs @ 12.08 hrs, Volume= 0.132 af
Outflow = 0.55 cfs @ 12.46 hrs, Volume= 0.132 af, Atten= 74%, Lag= 22.6 min
Discarded = 0.11 cfs @ 12.46 hrs, Volume= 0.110 af
Primary = 0.44 cfs @ 12.46 hrs, Volume= 0.021 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs / 3
Peak Elev= 18.11' @ 12.46 hrs Surf.Area= 1,903 sf Storage= 2,174 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 180.3 min (969.3 - 789.1)

Volume	Invert	Avail.Storage	Storage Description
#1	16.50'	4,156 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

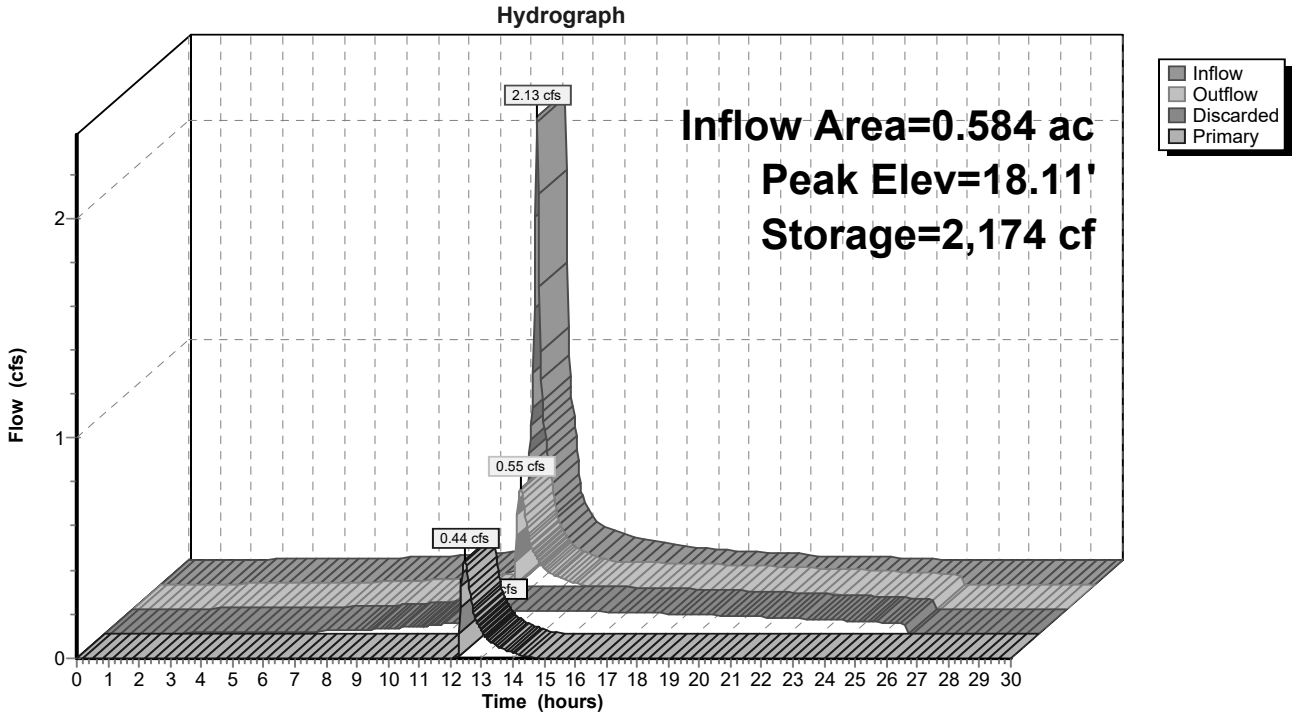
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
16.50	831	207.0	0	0	831
17.00	1,150	217.0	493	493	1,185
18.00	1,829	236.0	1,476	1,970	1,906
19.00	2,564	255.0	2,186	4,156	2,688

Device	Routing	Invert	Outlet Devices
#1	Discarded	16.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	18.00'	**5.0' long x 9.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69

Discarded OutFlow Max=0.11 cfs @ 12.46 hrs HW=18.11' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.44 cfs @ 12.46 hrs HW=18.11' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.44 cfs @ 0.81 fps)

Pond P-1: POND/BIOSWALE



Summary for Pond P-2: FOREBAY

Inflow Area = 0.474 ac, 52.53% Impervious, Inflow Depth = 2.70" for 25-YR MASHPEE ATLAS event
Inflow = 1.53 cfs @ 12.08 hrs, Volume= 0.107 af
Outflow = 1.49 cfs @ 12.08 hrs, Volume= 0.107 af, Atten= 2%, Lag= 0.2 min
Discarded = 0.02 cfs @ 12.46 hrs, Volume= 0.028 af
Primary = 1.47 cfs @ 12.08 hrs, Volume= 0.079 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs / 3
Peak Elev= 18.11' @ 12.46 hrs Surf.Area= 446 sf Storage= 447 cf

Plug-Flow detention time= 56.1 min calculated for 0.106 af (100% of inflow)
Center-of-Mass det. time= 56.4 min (896.2 - 839.8)

Volume	Invert	Avail.Storage	Storage Description
#1	16.50'	640 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

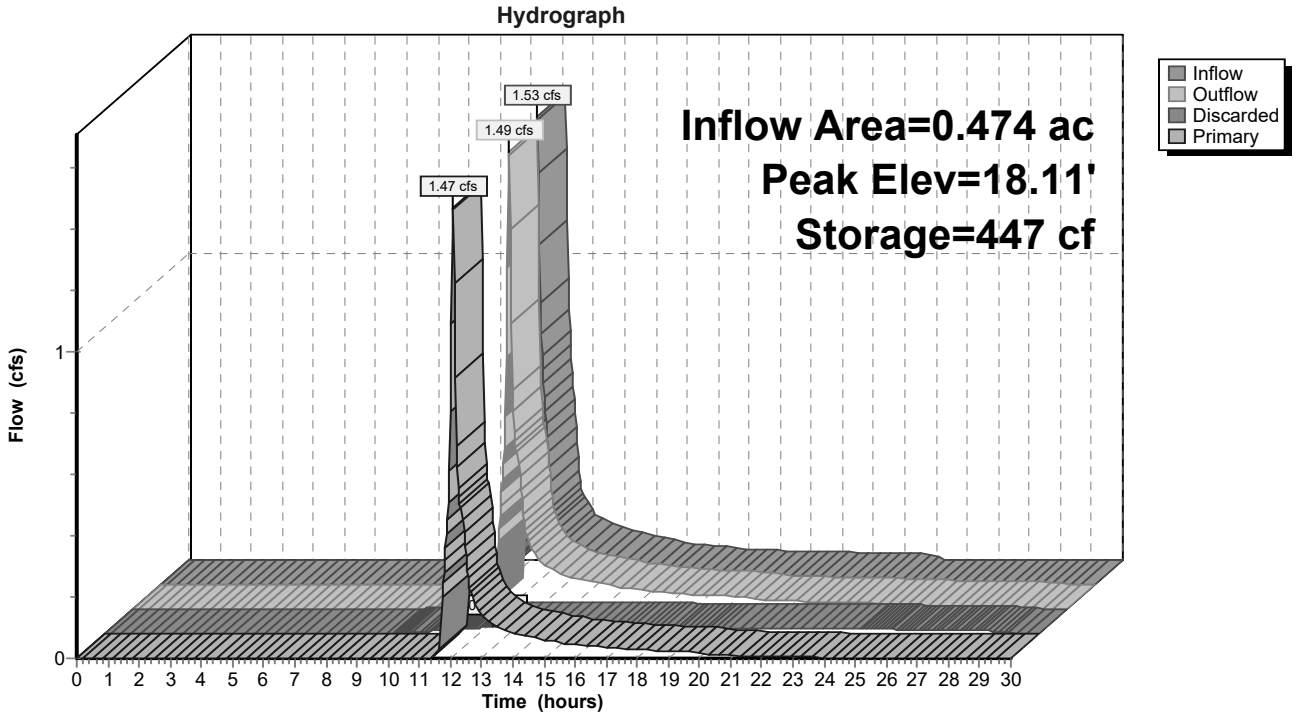
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
16.50	136	47.0	0	0	136
17.00	215	58.0	87	87	232
17.50	310	68.0	131	218	337
18.00	420	79.0	182	399	471
18.50	547	89.0	241	640	611

Device	Routing	Invert	Outlet Devices
#1	Discarded	16.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	17.50'	**5.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.02 cfs @ 12.46 hrs HW=18.11' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.48 cfs @ 12.08 hrs HW=17.75' TW=17.53' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Weir Controls 1.48 cfs @ 1.18 fps)

Pond P-2: FOREBAY



Summary for Subcatchment DA-1A: GRASS ABUTTING EXISTING POND

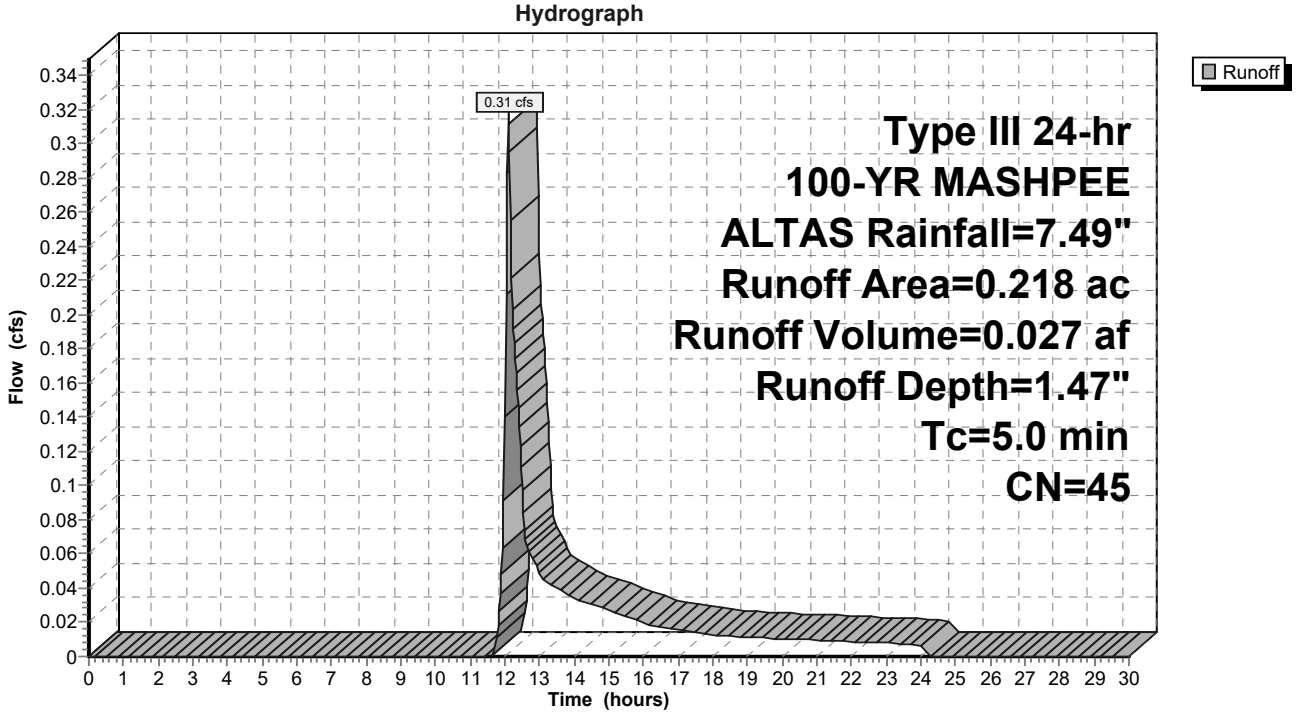
Runoff = 0.31 cfs @ 12.09 hrs, Volume= 0.027 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 100-YR MASHPEE ALTAS Rainfall=7.49"

Area (ac)	CN	Description
0.194	39	>75% Grass cover, Good, HSG A
0.024	98	Paved roads w/curbs & sewers, HSG A
0.218	45	Weighted Average
0.194		88.99% Pervious Area
0.024		11.01% Impervious Area

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

Subcatchment DA-1A: GRASS ABUTTING EXISTING POND



Summary for Subcatchment DA-1B: PARKING LOT

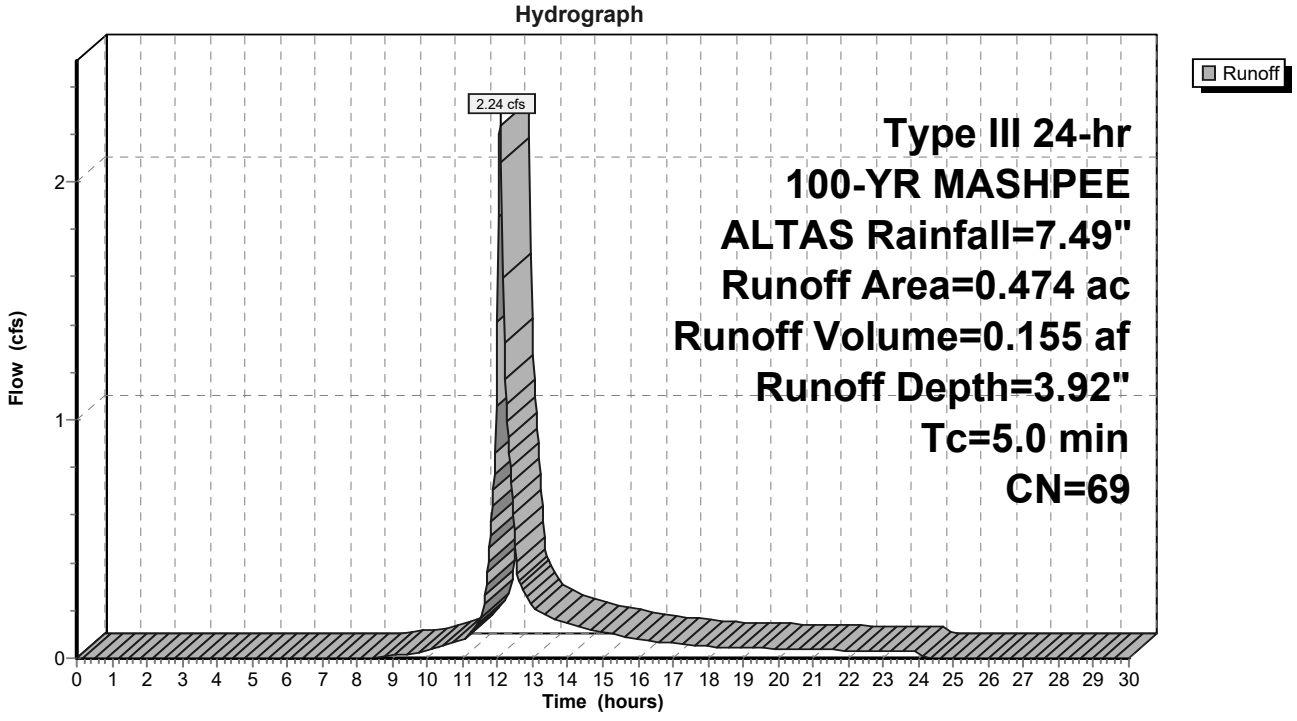
Runoff = 2.24 cfs @ 12.08 hrs, Volume= 0.155 af, Depth= 3.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 100-YR MASHPEE ALTAS Rainfall=7.49"

Area (ac)	CN	Description
0.197	39	>75% Grass cover, Good, HSG A
0.028	30	Woods, Good, HSG A
0.249	98	Paved parking, HSG A
0.474	69	Weighted Average
0.225		47.47% Pervious Area
0.249		52.53% Impervious Area

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

Subcatchment DA-1B: PARKING LOT



Summary for Subcatchment DA-1C: CLUB HOUSE AND CART PATH

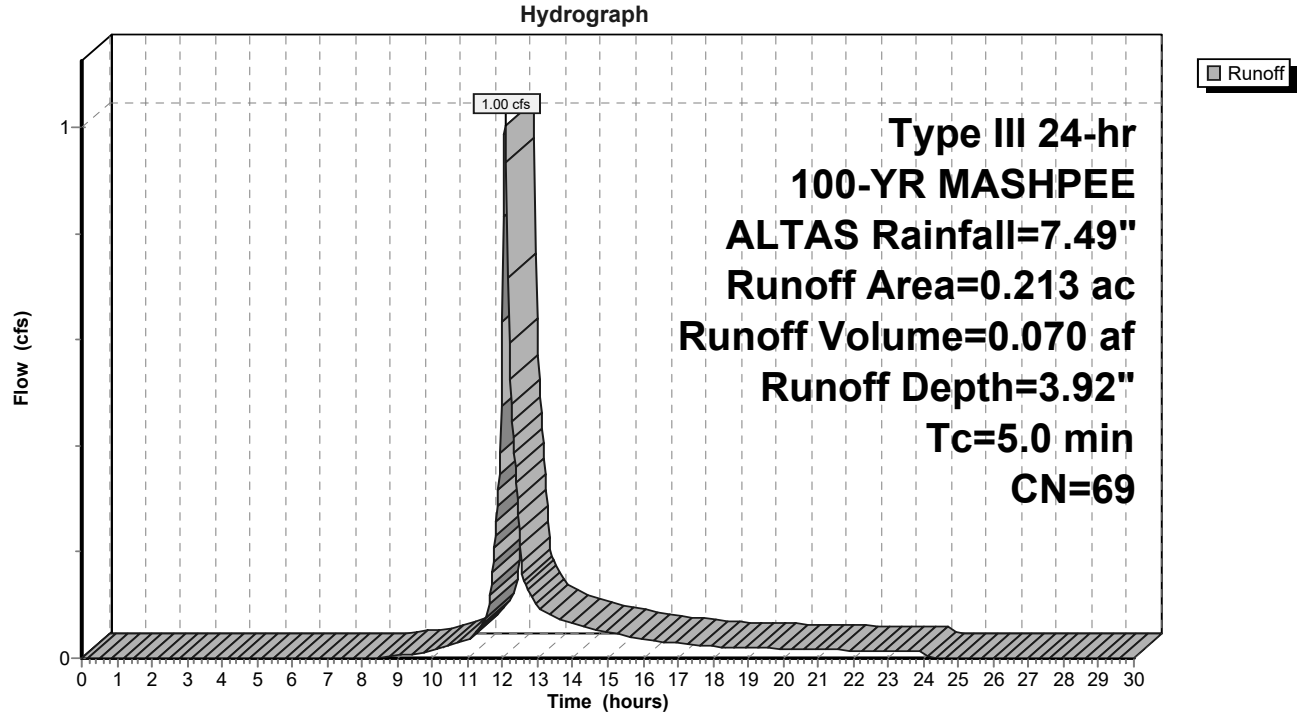
Runoff = 1.00 cfs @ 12.08 hrs, Volume= 0.070 af, Depth= 3.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 100-YR MASHPEE ALTAS Rainfall=7.49"

Area (ac)	CN	Description
0.088	39	>75% Grass cover, Good, HSG A
0.014	30	Woods, Good, HSG A
0.111	98	Paved roads w/curbs & sewers, HSG A
0.213	69	Weighted Average
0.102		47.89% Pervious Area
0.111		52.11% Impervious Area

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

Subcatchment DA-1C: CLUB HOUSE AND CART PATH



Summary for Subcatchment DA-2: GRASS AND CART PATH ABUTTING POND

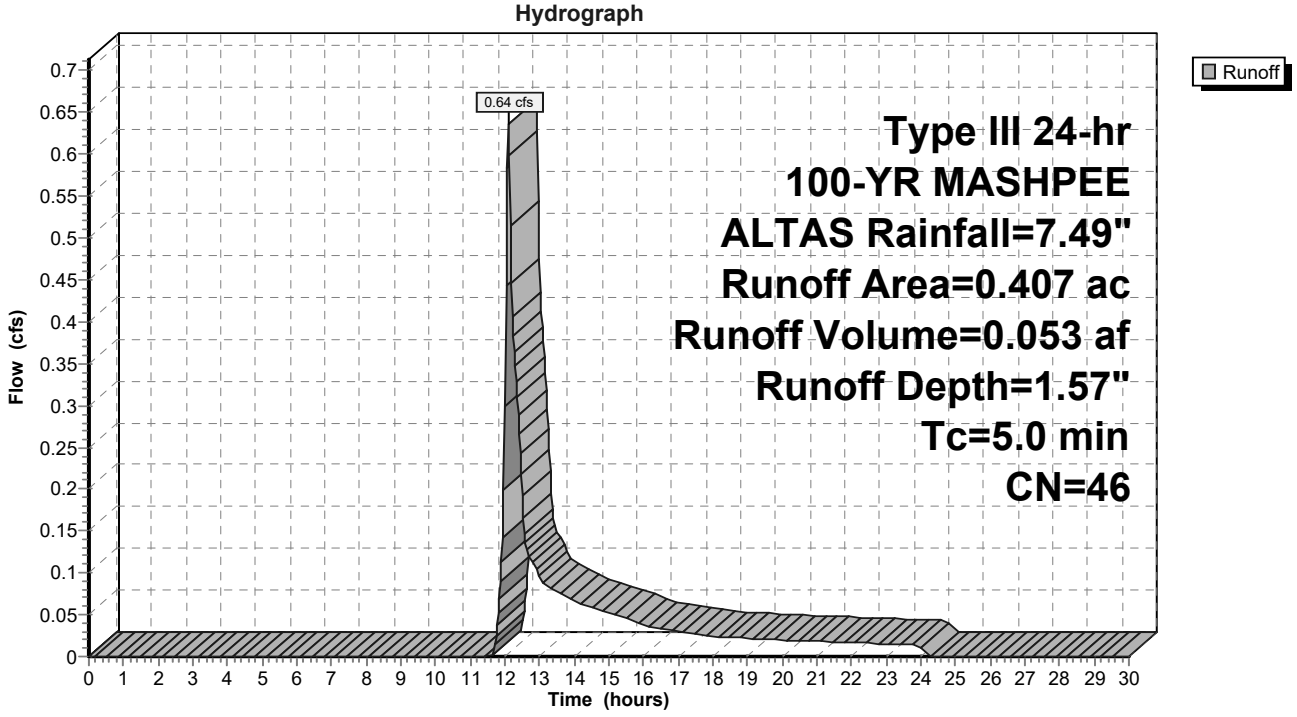
Runoff = 0.64 cfs @ 12.09 hrs, Volume= 0.053 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 100-YR MASHPEE ALTAS Rainfall=7.49"

Area (ac)	CN	Description
0.356	39	>75% Grass cover, Good, HSG A
0.051	98	Paved parking, HSG A
0.407	46	Weighted Average
0.356		87.47% Pervious Area
0.051		12.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, L1**

Subcatchment DA-2: GRASS AND CART PATH ABUTTING POND



Summary for Subcatchment R1: ROOF

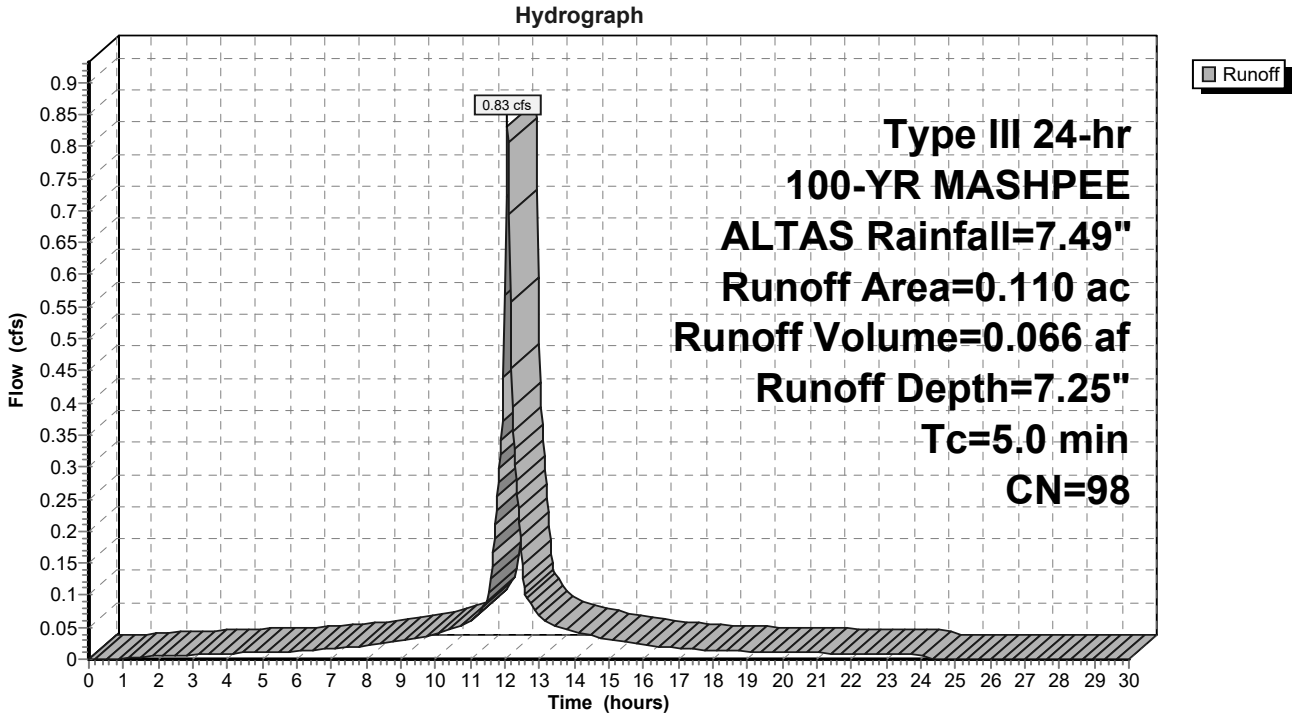
Runoff = 0.83 cfs @ 12.07 hrs, Volume= 0.066 af, Depth= 7.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs
Type III 24-hr 100-YR MASHPEE ALTAS Rainfall=7.49"

Area (ac)	CN	Description
0.110	98	Roofs, HSG A
0.110		100.00% Impervious Area

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

Subcatchment R1: ROOF

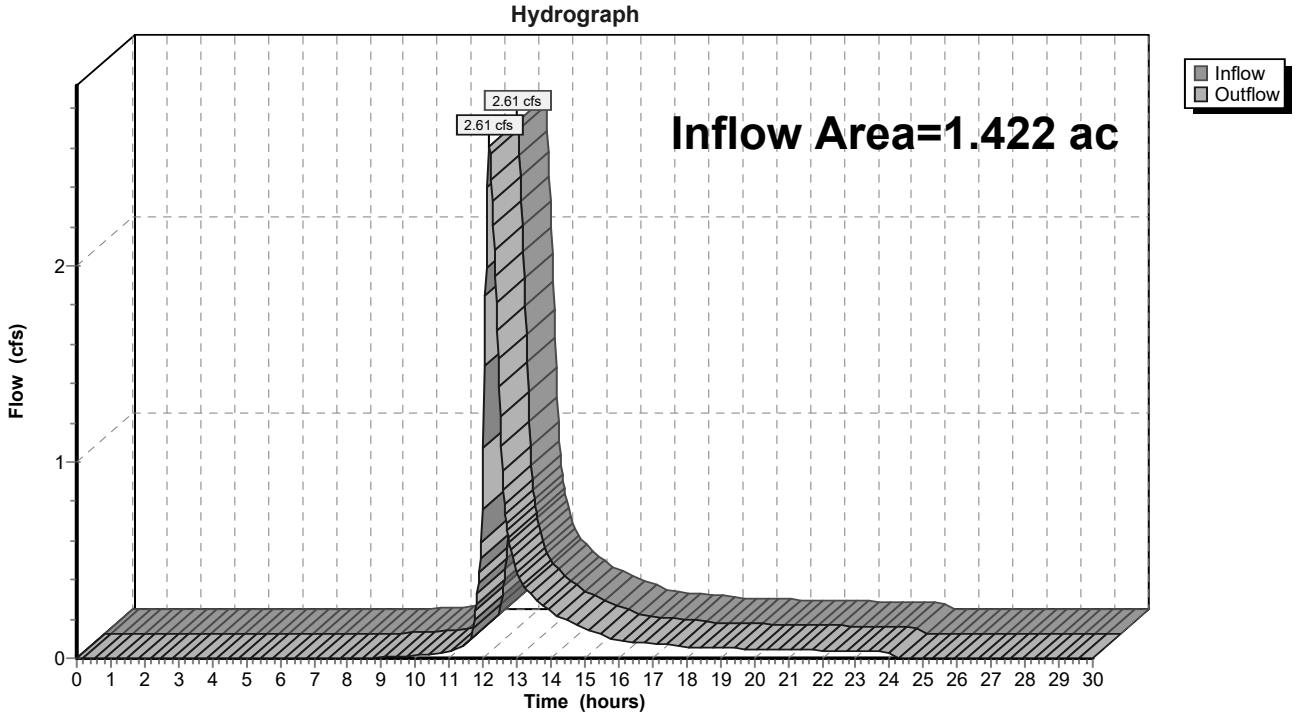


Summary for Reach SP#1: STUDY POINT #1

Inflow Area = 1.422 ac, 38.33% Impervious, Inflow Depth = 1.82" for 100-YR MASHPEE ALTAS event
Inflow = 2.61 cfs @ 12.17 hrs, Volume= 0.216 af
Outflow = 2.61 cfs @ 12.17 hrs, Volume= 0.216 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs / 3

Reach SP#1: STUDY POINT #1



Summary for Pond P-1: POND/BIOSWALE

Inflow Area = 0.584 ac, 61.47% Impervious, Inflow Depth = 3.94" for 100-YR MASHPEE ALTAS event
Inflow = 2.59 cfs @ 12.07 hrs, Volume= 0.192 af
Outflow = 1.52 cfs @ 12.22 hrs, Volume= 0.192 af, Atten= 41%, Lag= 8.8 min
Discarded = 0.11 cfs @ 12.22 hrs, Volume= 0.126 af
Primary = 1.41 cfs @ 12.22 hrs, Volume= 0.066 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs / 3
Peak Elev= 18.23' @ 12.22 hrs Surf.Area= 1,990 sf Storage= 2,418 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 146.0 min (938.0 - 792.0)

Volume	Invert	Avail.Storage	Storage Description
#1	16.50'	4,156 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

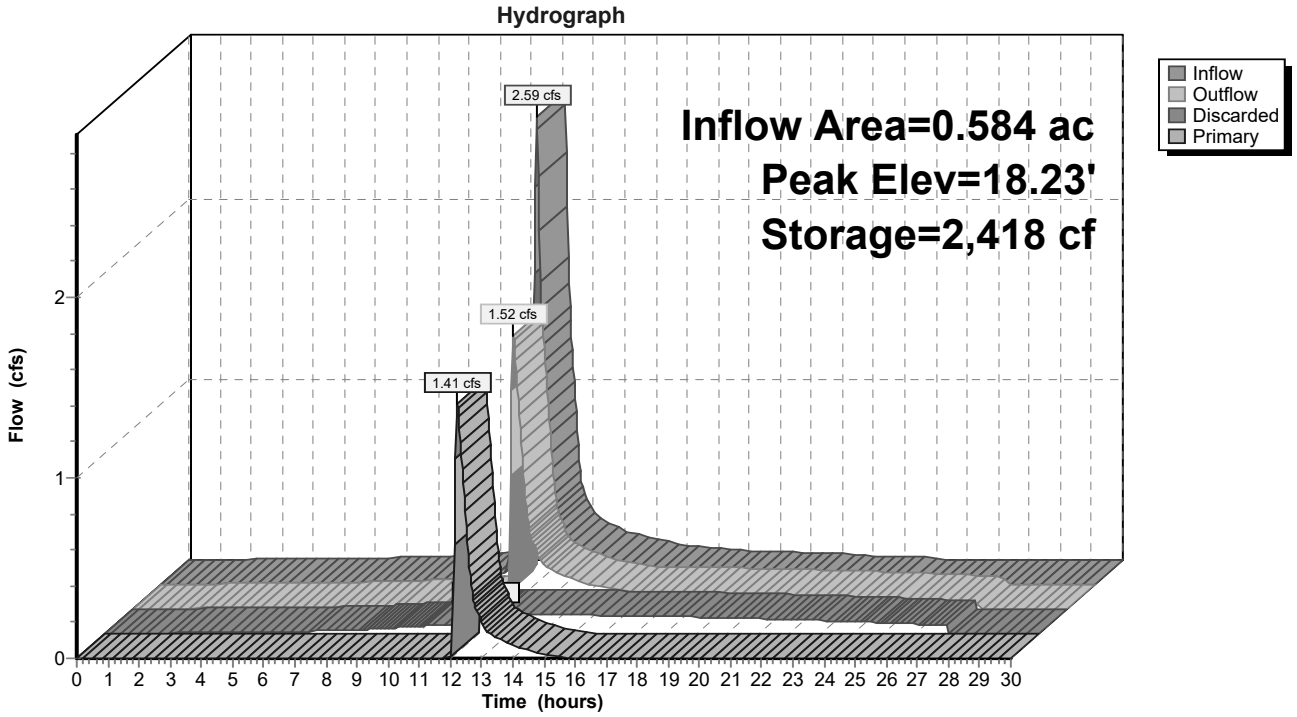
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
16.50	831	207.0	0	0	831
17.00	1,150	217.0	493	493	1,185
18.00	1,829	236.0	1,476	1,970	1,906
19.00	2,564	255.0	2,186	4,156	2,688

Device	Routing	Invert	Outlet Devices
#1	Discarded	16.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	18.00'	**5.0' long x 9.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69

Discarded OutFlow Max=0.11 cfs @ 12.22 hrs HW=18.23' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=1.40 cfs @ 12.22 hrs HW=18.23' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 1.40 cfs @ 1.20 fps)

Pond P-1: POND/BIOSWALE



Summary for Pond P-2: FOREBAY

Inflow Area = 0.474 ac, 52.53% Impervious, Inflow Depth = 3.92" for 100-YR MASHPEE ALTAS event
Inflow = 2.24 cfs @ 12.08 hrs, Volume= 0.155 af
Outflow = 1.78 cfs @ 12.07 hrs, Volume= 0.155 af, Atten= 20%, Lag= 0.0 min
Discarded = 0.03 cfs @ 12.22 hrs, Volume= 0.030 af
Primary = 1.76 cfs @ 12.07 hrs, Volume= 0.125 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs / 3
Peak Elev= 18.24' @ 12.22 hrs Surf.Area= 478 sf Storage= 506 cf

Plug-Flow detention time= 42.4 min calculated for 0.155 af (100% of inflow)
Center-of-Mass det. time= 42.7 min (871.7 - 829.0)

Volume	Invert	Avail.Storage	Storage Description
#1	16.50'	640 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

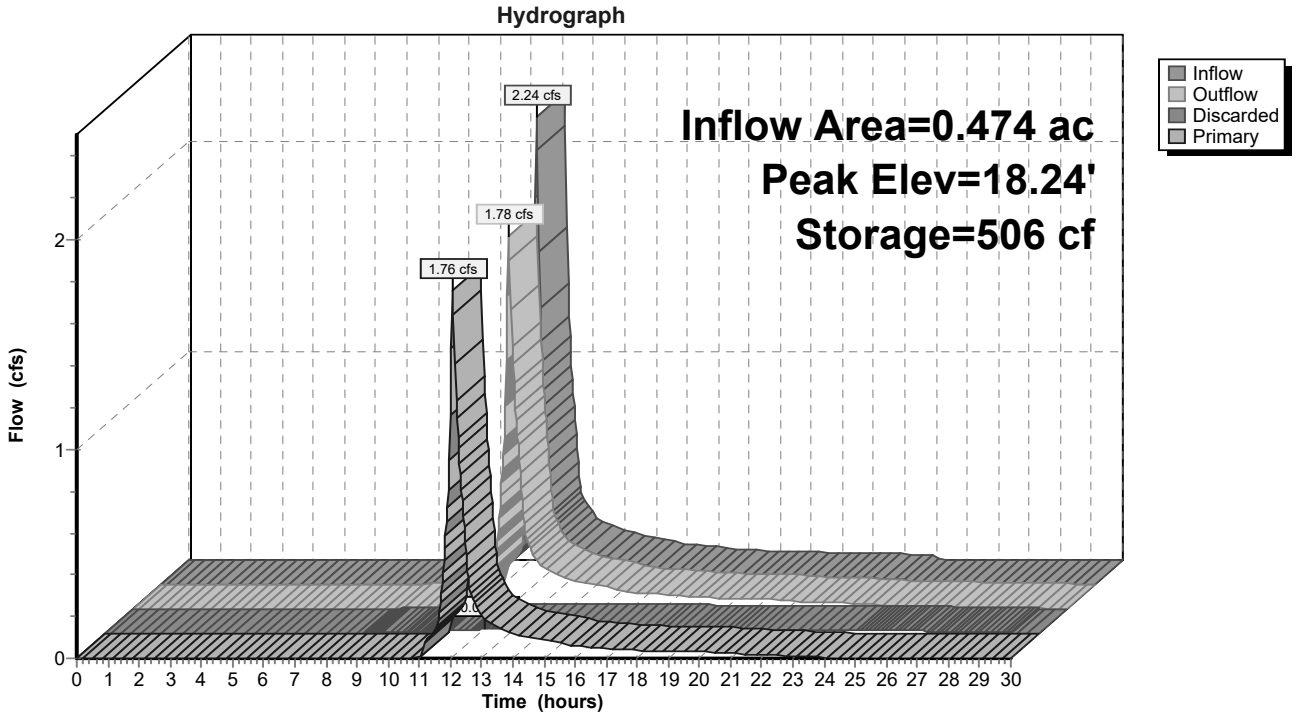
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
16.50	136	47.0	0	0	136
17.00	215	58.0	87	87	232
17.50	310	68.0	131	218	337
18.00	420	79.0	182	399	471
18.50	547	89.0	241	640	611

Device	Routing	Invert	Outlet Devices
#1	Discarded	16.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	17.50'	**5.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Discarded OutFlow Max=0.03 cfs @ 12.22 hrs HW=18.24' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=1.75 cfs @ 12.07 hrs HW=17.98' TW=17.94' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Weir Controls 1.75 cfs @ 0.73 fps)

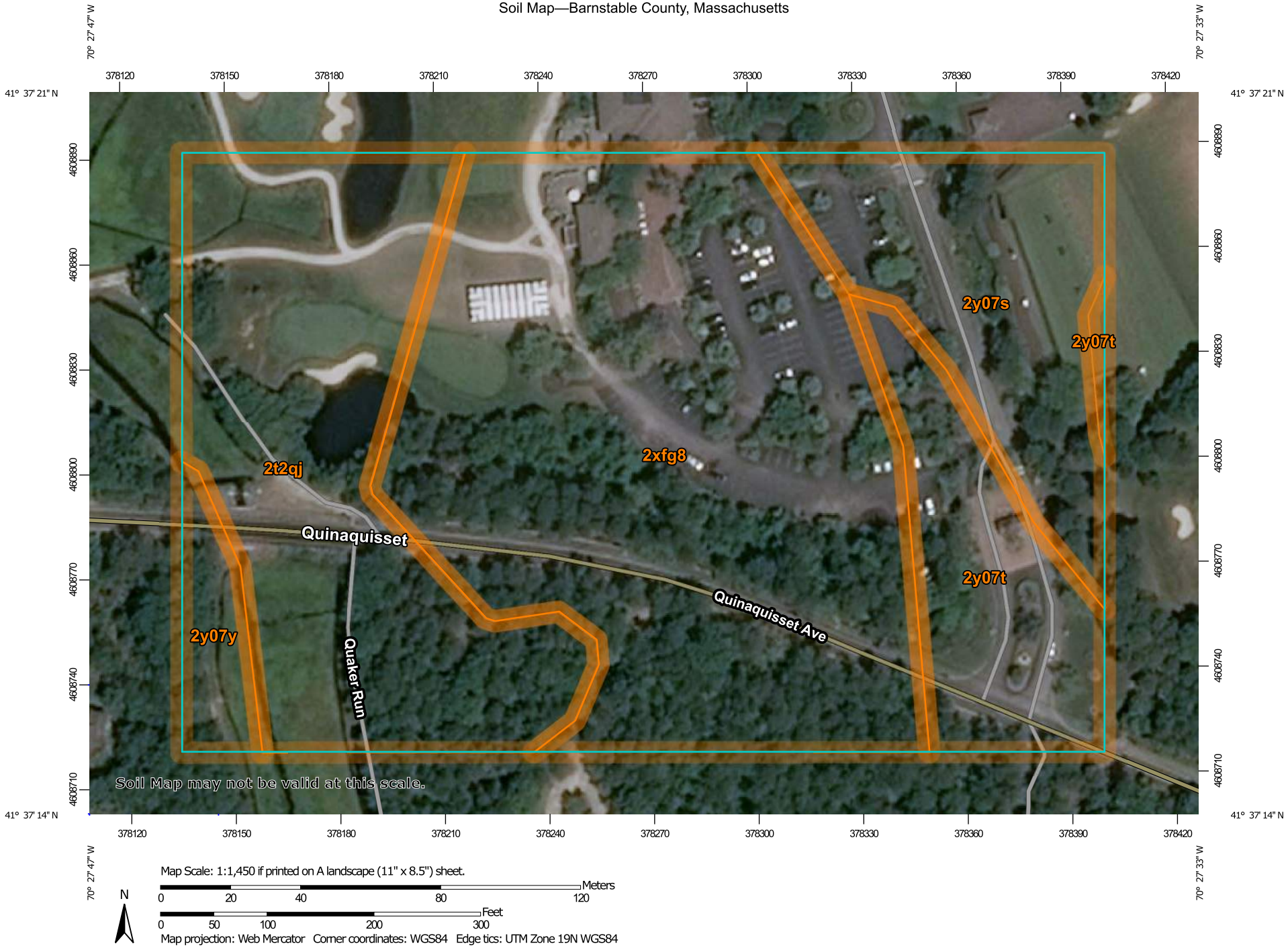
Pond P-2: FOREBAY



APPENDIX C

SITE SOIL INFORMATION

- SOIL SURVEY MAPS AND MAP UNITS.
- CLASSIFICATION AND DESCRIPTION OF SOILS ON SITE.



Map Scale: 1:1,450 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

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 1:25,000.

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: Barnstable County, Massachusetts
Survey Area Data: Version 16, Sep 12, 2019

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

Date(s) aerial images were photographed: Jul 10, 2018—Nov 17, 2018

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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2t2qj	Freetown coarse sand, 0 to 3 percent slopes, sanded surface	3.0	26.7%
2xfg8	Deerfield loamy fine sand, 0 to 3 percent slopes	5.2	45.9%
2y07s	Carver loamy coarse sand, 0 to 3 percent slopes	1.5	13.8%
2y07t	Carver loamy coarse sand, 3 to 8 percent slopes	1.2	10.6%
2y07y	Carver coarse sand, 15 to 35 percent slopes	0.3	3.0%
Totals for Area of Interest		**11.2**	**100.0%**

Barnstable County, Massachusetts

2xfg8—Deerfield loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2xfg8
Elevation: 0 to 1,100 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Deerfield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Deerfield

Setting

Landform: Kame terraces, outwash plains, outwash deltas, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex, linear, concave
Across-slope shape: Concave, linear, convex
Parent material: Sandy outwash derived from granite, gneiss, and/or quartzite

Typical profile

Ap - 0 to 9 inches: loamy fine sand
Bw - 9 to 25 inches: loamy fine sand
BC - 25 to 33 inches: fine sand
Cg - 33 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: About 15 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 11.0
Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Windsor
Percent of map unit: 7 percent
Landform: Outwash plains, outwash deltas, kame terraces, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear, concave, convex
Across-slope shape: Concave, linear, convex
Hydric soil rating: No

Wareham
Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Sudbury
Percent of map unit: 2 percent
Landform: Outwash deltas, kame terraces, outwash plains, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear, convex, concave
Across-slope shape: Convex, concave, linear
Hydric soil rating: No

Ninigret
Percent of map unit: 1 percent
Landform: Outwash plains, kame terraces, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex, linear
Across-slope shape: Convex, concave
Hydric soil rating: No

Data Source Information

Soil Survey Area: Barnstable County, Massachusetts
Survey Area Data: Version 16, Sep 12, 2019

Town of Mashpee
16 Great Neck Road North
Mashpee, Massachusetts 02649

Mr. Jan Aggerbeck, Owner
Cape Cod Coffee
10 Evergreen Circle
Mashpee, MA 02649

Re: Restoration of cleared area with placement of temporary fill

June 18, 2020

Mr. Aggerbeck,

As you are aware the Planning Board met on 6/17/2020 and discussed the inspection report by the Consulting Engineer Charles Rowley dated 6/11/2020. In his report he noted, "… there is a significant amount of clearing and placement of temporary fill starting at Evergreen Circle that is within the area that was marked on Sheet 3 of 6 of the approved plan of September 3, 2019 as "Area to remain in its natural state.""

In response to the engineer's letter, Brian Catignani, project manager, wrote on June 15, 2020 that, "the property owner intends to revegetate this "disturbed" area with similar native plantings following construction activity at the front of the property."

It was the consensus of the board that the proposed remedy to revegetate the specified area was adequate but directed me to further communicate that prior to revegetating the area, all temporary fill must be removed. While the Board is confident that was your intention, it was not specifically clarified in Mr. Catignani's letter.

This issue will be rectified upon the satisfactory removal of the temporary fill and revegation of the area with similar native plantings. No additional action will be necessary if these conditions are met. Charlie Rowley is expected to communicate the same, in person, at his next inspections.

Thank you,

Evan R. Lehrer
Town Planner

Cc: Brian Catignani (via email)
Charlie Rowley (via email)

PIERCE ATWOOD LLP

MICHELLE N. O'BRIEN

100 Summer Street #2250
Boston, MA 02110

P 617.488.8146
F 617.824.2020
mobrien@pierceatwood.com
www.pierceatwood.com

Admitted in: MA, ME

June 15, 2020

Via Electronic Mail elehrer@mashpeema.gov

Evan R. Lehrer
Town Planner
Town of Mashpee
16 Great Neck Road North
Mashpee, Massachusetts 02649

RE: SouthCape Village Special Permit
Notice of Intention to Sell Property and Transfer Special Permit

Dear Mr. Lehrer:

Thank you for your letter of June 12, 2020 notifying me of the Planning Board's approval of my request, submitted on behalf of DPF Mashpee LLC, to allow less than 90 days' notice for transfer of the above-referenced special permit. The sale of the property is not going forward at this time. Accordingly, there is no need to transfer the permit.

Thank you for your consideration.

Very truly yours,

Michelle N. O'Brien

Michelle N. O'Brien

Massachusetts Department of Environmental Protection

eDEP Transaction Copy

Here is the file you requested for your records.

To retain a copy of this file you must save and/or print.

Username:	**EBELAIR**
Transaction ID:	**1198905**
Document:	**Groundwater Discharge Monitoring Report Forms**
Size of File:	**1029.15K**
Status of Transaction:	**Submitted**
Date and Time Created:	**6/22/2020:6:34:08 AM**

Note: This file only includes forms that were part of your transaction as of the date and time indicated above. If you need a more current copy of your transaction, return to eDEP and select to “Download a Copy” from the Current Submittals page.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Groundwater Discharge Program

Groundwater Permit

DISCHARGE MONITORING REPORT

668
1. Permit Number

[redacted]
2. Tax identification Number

2020 MAY MONTHLY
3. Sampling Month & Frequency

A. Facility Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

1. Facility name, address:

SOUTH CAPE VILLAGE
a. Name

672 FALMOUTH ROAD/RTE. 28
b. Street Address

MASHPEE | MA | 02649
c. City | d. State | e. Zip Code

2. Contact information:

MYLES OSTROFF
a. Name of Facility Contact Person

6174311097 | myles@chartweb.com
b. Telephone Number | c. e-mail address

3. Sampling information:

5/7/2020 | RI ANALYTICAL
a. Date Sampled (mm/dd/yyyy) | b. Laboratory Name

NICOLE SKYLESON
c. Analysis Performed By (Name)

B. Form Selection

1. Please select Form Type and Sampling Month & Frequency

Discharge Monitoring Report - 2020 May Monthly

☐ All forms for submittal have been completed.

2. ☐ This is the last selection.

3. ☐ Delete the selected form.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Groundwater Discharge Program

Groundwater Permit

DISCHARGE MONITORING REPORT

668
1. Permit Number

[redacted]
2. Tax identification Number

2020 MAY MONTHLY
3. Sampling Month & Frequency

D. Contaminant Analysis Information

- For "0", below detection limit, less than (<) value, or not detected, enter "ND"
- TNTC = too numerous to count. (Fecal results only)
- NS = Not Sampled

1. Parameter/Contaminant	2. Influent	3. Effluent	4. Effluent Method
Units			Detection limit
BOD	54	28	8.0
MG/L			
TSS	72	4.7	2.0
MG/L			
TOTAL SOLIDS	430		
MG/L			
AMMONIA-N	9.8		
MG/L			
NITRATE-N		2.2	0.25
MG/L			
TOTAL NITROGEN(NO3+NO2+TKN)		5.1	0.25
MG/L			
OIL & GREASE		ND	0.5
MG/L			

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Groundwater Discharge Program

Groundwater Permit

DAILY LOG SHEET

668
1. Permit Number

[redacted]
2. Tax identification Number

2020 MAY DAILY
3. Sampling Month & Frequency

A. Facility Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

1. Facility name, address:

SOUTH CAPE VILLAGE
a. Name

672 FALMOUTH ROAD/RTE. 28
b. Street Address

MASHPEE | MA | 02649
c. City | d. State | e. Zip Code

2. Contact information:

MYLES OSTROFF
a. Name of Facility Contact Person

6174311097 | myles@chartweb.com
b. Telephone Number | c. e-mail address

3. Sampling information:

5/31/2020 | WHITEWATER
a. Date Sampled (mm/dd/yyyy) | b. Laboratory Name

LAURA JOHNSON
c. Analysis Performed By (Name)

B. Form Selection

1. Please select Form Type and Sampling Month & Frequency

Daily Log Sheet - 2020 May Daily

☐ All forms for submittal have been completed.

2. ☐ This is the last selection.

3. ☐ Delete the selected form.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Groundwater Discharge Program

Groundwater Permit

DAILY LOG SHEET

668
1. Permit Number

[redacted]
2. Tax identification Number

2020 MAY DAILY
3. Sampling Month & Frequency

C. Daily Readings/Analysis Information

Date	Effluent Flow GPD	Reuse Flow GPD	Irrigation Flow GPD	Turbidity	Influent pH	Effluent pH	Chlorine Residual (mg/l)	UV Intensity (%)
1	7798					7.4		
2	7799							
3	7798							
4	3871					7.4		
5	7617					7.4		
6	7664					7.4		
7	7735					7.4		
8	7678					7.4		
9	7678							
10	7677							
11	7539					7.4		
12	7923					7.3		
13	7583					7.4		
14	7514					7.3		
15	7558					7.3		
16	7558							
17	7557							
18	6671					7.3		
19						7.3		
20	3700							
21	6722					7.4		
22	7740					7.4		
23	7740							
24	7740							
25	7740							
26	7497					7.5		
27	7667					7.4		
28	7514					7.4		
29	8760					7.4		
30	8761							
31	8761							

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Groundwater Discharge Program

Groundwater Permit

MONITORING WELL DATA REPORT

668
1. Permit Number

[redacted]
2. Tax identification Number

2020 MAY MONTHLY
3. Sampling Month & Frequency

A. Facility Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

1. Facility name, address:

SOUTH CAPE VILLAGE
a. Name

672 FALMOUTH ROAD/RTE. 28
b. Street Address

MASHPEE | MA | 02649
c. City | d. State | e. Zip Code

2. Contact information:

MYLES OSTROFF
a. Name of Facility Contact Person

6174311097 | myles@chartweb.com
b. Telephone Number | c. e-mail address

3. Sampling information:

5/6/2020 | WHITEWATER
a. Date Sampled (mm/dd/yyyy) | b. Laboratory Name

LAURA JOHNSON
c. Analysis Performed By (Name)

B. Form Selection

1. Please select Form Type and Sampling Month & Frequency

Monitoring Well Data Report - 2020 May Monthly

☐ All forms for submittal have been completed.

2. ☐ This is the last selection.

3. ☐ Delete the selected form.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Groundwater Discharge Program

Groundwater Permit

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3. Sampling Month & Frequency

C. Contaminant Analysis Information

- For "0", below detection limit, less than (<) value, or not detected, enter "ND" <
- TNTC = too numerous to count. (Fecal results only)
- NS = Not Sampled
- DRY = Not enough water in well to sample.

Parameter/Contaminant		P-1	P-2	P-4	P-6		
	Units	Well #: 1	Well #: 2	Well #: 3	Well #: 4	Well #: 5	Well #: 6
PH	S.U.	5.39	5.92	5.66	6.44		
STATIC WATER LEVEL	FEET	17.15	46.28	50.9	49.42		
SPECIFIC CONDUCTANCE	UMHOS/C	630	248	233	1231		

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Groundwater Permit

668
1. Permit Number

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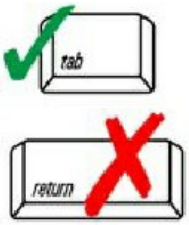

Any person signing a document under 314 CMR 5.14(1) or (2) shall make the following certification

If you are filing electronic-ally and want to attach additional comments, select the check box.

☐

Facility Information

SOUTH CAPE VILLAGE
a. Name

672 FALMOUTH ROAD/RTE. 28
b. Street Address

MASHPEE	MA	02649
c. City	d. State	e. Zip Code

Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that the are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

ELIZABETH BELAIR	6/16/2020
a. Signature	b. Date (mm/dd/yyyy)

Reporting Package Comments

PLANT MET ALL PERMIT REQUIREMENTS FOR MAY 2020.