TOWN OF MILLIS Tuesday January 16th 2024 6:00 PM Remote -Hybrid https://us02web.zoom.us/j/88553665824

6:00 p.m. Open BOH Meeting.

- 6:10 p.m. EHIR Well #3 DPW Kleinfelder Continued
- 6:30 p.m. Discussion 121 Norfolk Cell Tower continued

Tentative Date of Next Meeting: February 5th 2024

TOWN OF MILLIS				
Notice of Meeting				
The BOARD OF HEALTH				
Will Remote -Hybrid Meet at 6:00 P.M.				
On Tuesday January 16 th 2024				
Zoom Online meeting.				
Assistant Town Clerk				
Posted, 2024				

Join Zoom Meeting https://us02web.zoom.us/j/88553665824 Meeting ID: 885 5366 5824 One tap mobile +13017158592,,88553665824# US (Washington DC) 13052241968,,88553665824# +US



January 3, 2023

Mr. John McVeigh Health Director Board of Health Town of Millis 900 Main Street Millis, MA 02054

RE: Peer Review – EHIR Well #3 Treatment Plant PFAS Upgrades

Dear Mr. McVeigh:

As requested, GCG has reviewed the EHIR submittal for improvements proposed at the Town of Millis Well #3 adjacent to Birch Street for compliance with Millis Board of Health Public and Environmental Health Review Regulations and Standards. The submittal prepared by Kleinfelder dated October 30,203 included the following component which were reviewed under the EHIR.

- Notice of Intent (reviewed with respect to EHIR only)
- Project Plans, Town of Millis, Massachusetts, Well 3 Water Treatment Facility dated October 2023.
- Stormwater Report, dated October 2023

The project involves the construction of a new building to accommodate the proposed PFAS treatment system which includes four 10,000-pound GAC filters for the well. Site improvements for the new building include paving, regrading, demolition of existing building, stormwater improvements, sewage tite tank and water treatment improvements.

Based upon our review of the above information, we offer the following comments with respect to compliance with Millis Board of Health Public and Environmental Health Review Regulations and Standards. The numerical section of the regulations is referenced at the beginning of each comment as it relates to the regulations.

SECTION VII – WATER SUPPLY

The proposed improvements to the existing Millis water supply are required based upon meeting current PFAS standards. The system appears to be designed to follow current standards and regulations with respect to water treatment of PFAS. The Town has hired Kleinfelder as their consultant to design this system. GCG did not review the actual design for compliance.

SECTION VIII – SEWAGE DISPOSAL

The project is in a Zone 1 for the existing water supply and disposal of wastewater is not permitted in a Zone 1. The applicant proposes a 2000-gallon tank with no discharge of sewage. The plan set references sewer plans which were not found in the application. Sewage flows and design should be provided for review.

SECTION XII. - DRAINAGE

The stormwater drainage systems is designed for storm events up to a 100 year storm event. In general, the design meets the goals of the drainage regulations with the following exceptions.

- 1. The cover over the 8" drain is less than one foot in the paved area of the stormwater forebay in front of the building.
- 2. The drain from the forebay to forebay should be extended so that it is at the bottom of the infiltration basin.
- 3. The rip rap area at the end of the pipe connecting the forebays should be shown at the toe of the slope. It is not necessary to place rip rap on the slope.
- 4. MassDEP Stormwater Handbook recommends a 10-foot area around the basin to allow access. The current basin has a three-foot strip for the top of the berm.
- 5. The stormwater report shows that the rate of flow does not increase. A table should be provided to show the volume does not increase as required under the regulations.
- 6. Calculations should be provided showing the drain time of the infiltration basin. Seventy-two hours are recommended in the Stormwater Handbook.
- 7. The regulations require 4 to 1 slope for basins. The design has 3 to 1 slope.
- 8. A test hole should be performed in the basin to confirm the 2-foot groundwater separation is met or provide other documentation. The adjacent wetlands are at elevation 121 which may be indicative of the water table elevation. The bottom of the basin is at elevation 122.
- 9. The basin should have one foot of freeboard during a 100-year event.

SECITON XIII – EARTH REMOVAL STANDARDS

The volume of material removed was not provided to allow for a determination if review under this regulation is required. In general, the design appears to comply with the intent of the standard under this section.

If you have any questions regarding these matters, please contact our office.

Respectfully Submitted, GCG Associates

Michael J. Carter

Michael J. Carter, P.E. Project Manager



MEMORANDUM

TO:	John McVeigh, Health Director, Board of Health, Millis, MA
FROM:	Gregory Avenia, P.E., Kleinfelder
DATE :	January 15, 2024
SUBJECT:	Response to Peer Review Stormwater Comments EHIR Well #3 Treatment Plant PFAS Upgrades
CC:	Tyler Bernier, Project Manage Kleinfelder Michael J. Carter, P.E., Project Manager, GCG Associates

Kleinfelder has prepared this memorandum in response to third-party peer review comments on the EHIR submittal for the Well #3 Treatment Plant PFAS Upgrades project originally submitted on October 30, 2023. The referenced comments are from the document titled "Peer Review – EHIR Well #3 Treatment Plant PFAS Upgrades" from GCG Associates, dated January 3, 2023 (assumed to be corrected to 2024), and provided to Kleinfelder on January 5, 2024.

SECTION VIII – SEWAGE DISPOSAL

Comment:

"The applicant proposed a 2000-gallon tank with no discharge of sewage. The plan set references sewer plans which were not found in the application. Sewage flows and design should be provided for review."

Response:

A set of sewer plans were provided to the Board of Health on January 5, 2024 for review.

SECTION XII – DRAINAGE

Comment 1:

"The cover over the 8" drain is less than one foot in the paved area of the stormwater forebay in front of the building."

Response 1:

The site plans have been revised to add additional cover over the 8" drainpipe by lowering the pipe inlet elevation and raising grade over the top of the pipe. The pipe is specified to be ductile iron for additional strength due to the shallow cover.

Comment 2:

"The drain from the forebay to forebay should be extended so that it is at the bottom of the infiltration basin."

January 15, 2024

www.kleinfelder.com



Response 2:

The drain has been extended to the bottom of the infiltration basin. This change is reflected on the attached revised site plans.

Comment 3:

"The rip rap area at the end of the pipe connecting the forebays should be shown at the toe of the slope. It is not necessary to place rip rap on the slope."

Response 3:

The rip rap area has been adjusted to the toe of slope with the extension of the drainpipe to the bottom of the basin. However, the rip rap is still extended slightly up the slope to protect the area around the end of the drainpipe that will be more difficult to establish vegetation within.

Comment 4:

"MassDEP Stormwater handbook recommends a 10-foot area around the basin to allow access. The current basin has a three-foot strip for the top of the berm."

Response 4:

The berm associated with the infiltration basin is less than 3 feet in height at its tallest point and is limited to the southern and eastern sides of the basin, which are flanked by flat, open fields. The basin is easily accessible for maintenance from all sides. Expanding the top width of the berm would significantly increase the project footprint beyond the current limit of disturbance approved by the Conservation Commission.

Comment 5:

"The stormwater report shows that the rate of flow does not increase. A table should be provided to show the volume does not increase as required under the regulations."

Response 5:

The attached stormwater memo now includes a table highlighting the volumes for each model condition.

Comment 6:

"Calculations should be provided showing the drain time of the infiltration basin. Seventy-two hours are recommended in the Stormwater Handbook."

Response 6:

The proposed HydroCAD analysis results appended to the stormwater memo now include hydrographs that demonstrate the basin drains within seventy-two hours.



Comment 7:

"The regulations require 4 to 1 slopes for basins. The design has 3 to 1 slope."

Response 7:

Per the Infiltration Basin section of Volume 2 Chapter 2 of the Massachusetts Stormwater Handbook "Structural BMP Specifications for the Massachusetts Stormwater Handbook", infiltration basin designers must "Design the side slopes of the basin to be no steeper than 3:1 (horizontal: vertical) to allow for proper vegetative stabilization, easier mowing, easier access, and better public safety". Changing the side slopes to 4:1 (horizontal: vertical) would significantly increase the footprint of the basin and shift it closer to the foundation of the building due to the limited space available to the east.

Comment 8:

"A test hole should be performed in the basin to confirm the 2-foot groundwater separation is met or provide other documentation. The adjacent wetlands are at elevation 121 which may be indicative of the water table elevation. The bottom of the basin is at elevation 122."

Response 8:

Per the boring logs and location map included in Appendix F of the stormwater report groundwater was observed at approximately elevation 118. A monitoring well was installed on site adjacent to the boring location.

The soil boring log indicates the groundwater table is at elevation 118. The finish grade at the top of the monitoring well is approximately 126'. During construction of the well on March 10, 2023, groundwater was observed approximately 11.5 feet below the ground surface at elevation 114.5'.

During the design phase, Kleinfelder conducted two additional field visits to measure the depth to groundwater throughout the year. On August 30, 2023, groundwater was observed 7.67' below the ground surface at elevation 118.33'. During a follow up visit on October 12, 2023, groundwater was measured 8.01' below the ground surface at elevation 117.99'. As a conservative measure and based on the significant rainfall throughout 2024, seasonal high groundwater is estimated to be at or below elevation 120.00 in the vicinity of the proposed infiltration basin.

Comment 9:

"The basin should have one foot of freeboard during a 100-year event."

Response 9:

During the 100-year storm, the basin ponds to a maximum elevation of 123.31'. A spot grade at the top of the berm has been added to 124.4' to ensure 1 foot of freeboard is provided, and the applicable details on sheet C-502 have been updated accordingly.

TOWN OF MILLIS



OFFICE OF THE CONSERVATION COMMISSION

900 Main Street • Millis, MA 02054 Phone: 508-376-7045 Fax: 508-376-7053 https://www.millisma.gov/conservation-commission

November 20, 2023

Mr. James McKay Dept. of Public Works 900 Main Street Millis, MA 02054

RE: DEP File No.: #CE 225-0442 Well #3 PFAS Water Treatment Plant, Millis, MA

APPLICANT: James McKay, Millis DPW

PROJECT: Demolition of existing water infrastructure & construction of new treatment/PFAS plant (Village/Birch St.)

Dear Mr. McKay:

Enclosed please find an original and one copy of the Order of Conditions for the subject property. Please note you are **required** to file the original of this document at the Norfolk County Registry of Deeds in Dedham, Massachusetts, and provide proof of recording to the Commission **prior to starting construction/work**. Please do not hesitate to contact us should you have any questions.

Sincerely,

Canille Standley

Camille Standley Administrative Assistant

Encs.

cc: Tyler Bernier Kleinfelder (via email) Building Dept., BOH (via email) DEP CERO (via email) File

OOC Letter 0442 DPW Water Treatment Plant Well 3 11-20-2023.doc

Dr. James A. Lederer, *Chair* Carol Hayes, *Vice Chair* Edward Chisholm Christine Gavin John Steadman Scott McPhee David Larsen

Camille Standley Administrative Assistant cstandley@millisma.gov



Massachusetts Department of Environmental Protection Bureau of Resource Protection - Wetlands WPA Form 5 – Order of Conditions

Provided by MassDEP: CE225-0442 MassDEP File #

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40 eDEP Transaction #

Millis City/Town

A. General Information

Please note:		MILLIS						
this form has been modified	1. From:	Conservation Commission						
with added space to accommodate	2. This issu (check o		der of Condition	ons i	o. 🗌 Ame	ended Order	r of Con	ditions
the Registry of Deeds Requirements	з. То: Ар	plicant:						
	James	F.		McKay				
Important:	a. First N	Name		b. Last Nar	ne			
When filling	Town o	of Millis DPW						
out forms on	c. Organ	ization						
the	900 M	ain Street						
computer, use only the	d. Mailin	g Address						
tab key to	Millis			MA			02054	
move your cursor - do	e. City/T	own		f. State			g. Zip Coo	de
not use the return key.	4. Property	Owner (if different from ap		h l ant Nau				
Tab	a. First r	Name		b. Last Nar	ne			
return	c. Organ	ization						
	d. Mailin	g Address						
	e. City/T	own		f. State		1 %	g. Zip Coo	de
	5. Project L	ocation:						
	Village	Street/Birch Street		Millis				
	a. Street	Address		b. City/Tow	/n			
	28			41				
	c. Asses	sors Map/Plat Number		d. Parcel/L	ot Number			
	Latitud	e and Longitude, if known:	42.16900	l m	S	-71.34000	l m	S
			d. Latitude			e. Longitude		



WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP: CE225-0442 MassDEP File #

eDEP Transaction # Millis City/Town

A. General Information (cont.)

 Property recorded at the Registry of Deeds for (attach additional information if more than one parcel): Norfolk

NORTOIK			
a. County		b. Certificate Number (if r	egistered land)
		Deed not found, plar	n 377 of 1973
c. Book		d. Page	
Dates:	October 31, 2023	November 13, 2023	November 20, 2023
Dates.	a. Date Notice of Intent Filed	b. Date Public Hearing Closed	c. Date of Issuance
Final Ap as neede		iments (attach additional plan o	or document references
Town of	Millis, MA, Well 3 Water Trea	tment Facility, Permit Review S	Set October 2023
a. Plan Titl			
Kleinfeld	ler	Gregory Avenia, P.E	

Cicgory Averia, T.L.
c. Signed and Stamped by
1" = 20'
e. Scale
October 30, 2023
g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a.	Public Water Supply b	. [] Land Containing Shellfish	C.	Prevention of Pollution
d.	Private Water Supply e	· [Fisheries	f.	Protection of Wildlife Habitat
g.	Groundwater Supply h	. [Storm Damage Prevention	i.	Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

a. A the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

4



WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP: CE225-0442 MassDEP File #

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B. Findings (cont.)

Denied because:

- b. I the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. A description of the performance standards which the proposed work cannot meet is attached to this Order.
- c. I the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).
- Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a)
 a. linear feet

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Re	source Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4.	Bank	a. linear feet	b. linear feet	c. linear feet	d, linear feet
5.	Bordering		b. mear reet	c. intear reet	d. Intear leet
	Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6.	Land Under Waterbodies and Waterways	a. square feet	b. square feet	c. square feet	d. square feet
		e. c/y dredged	f. c/y dredged		
7.	Bordering Land	1661	1661	N/A	
	Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
	Cubic Feet Flood Storage	0			
	_	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8.	Isolated Land				
	Subject to Flooding	a. square feet	b. square feet		
	Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9.	Riverfront Area	a. total sq. feet	b. total sq. feet		
		a. total 39. 1001	S. total oq. loot		
	Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
	Sq ft between 100-				
	200 ft	g. square feet	h. square feet	i. square feet	j. square feet



WPA Form 5 – Order of Conditions Massachusetts Wetlands Protection Act M.G.L. c. 131, §40 Provided by MassDEP: CE225-0442 MassDEP File #

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Millis
City/Town

B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. Designated Port Areas	Indicate size u	inder Land Unde	er the Ocean, bel	ow
11. 🔲 Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. 🔲 Barrier Beaches	Indicate size u below	inder Coastal Be	aches and/or Co	oastal Dunes
13. 🗌 Coastal Beaches	a. square feet	b. square feet	cu yd c. nourishment	cu yd d. nourishment
	a. square reet	b. square leet		
14. 🗌 Coastal Dunes	a. square feet	b. square feet	cu yd c. nourishment	cu yd d. nourishment
15. 🗌 Coastal Banks	a. linear feet	b. linear feet		
16. 🔲 Rocky Intertidal)			
Shores	a. square feet	b. square feet		
17. Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
 Land Under Salt Ponds 	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19. 🔲 Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. 🔲 Fish Runs		d/or inland Land	nks, Inland Bank Under Waterboo	
	a. c/y dredged	b. c/y dredged		
21. Land Subject to				
Coastal Storm Flowage	a. square feet	b. square feet		
22. 🔲 Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100- 200 ft	g. square feet	h. square feet	i. square feet	j. square feet



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B. Findings (cont.)

* #23. If the 23. project is for the purpose of restoring or enhancing a wetland in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, 1. please enter the additional amount here. 2.

Restoration/Enhancement	*
1 tootor attorn Ennanocriterit	

a. square feet of BVW

b. square feet of salt marsh

resource area 24. Stream Crossing(s):

a. number of new stream crossings

b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

- 1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
- 2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
- 3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
- The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
 - a. The work is a maintenance dredging project as provided for in the Act; or
 - b. The time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
 - c. If the work is for a Test Project, this Order of Conditions shall be valid for no more than one year.
- 5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order. An Order of Conditions for a Test Project may be extended for one additional year only upon written application by the applicant, subject to the provisions of 310 CMR 10.05(11)(f).
- If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on _____ unless extended in writing by the Department.
- Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.



WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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C. General Conditions Under Massachusetts Wetlands Protection Act

- 8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.
- 9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.
- 10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]

"File Number CE225-0442 "

- 11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.
- 12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
- 13. The work shall conform to the plans and special conditions referenced in this order.
- 14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.
- 15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.
- 16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.



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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

- 17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.
- 18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

19. The work associated with this Order (the "Project")

(1) is subject to the Massachusetts Stormwater Standards

(2) is NOT subject to the Massachusetts Stormwater Standards

If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:

a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:

i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures; *ii.* as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;

iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;



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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;

v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following:

i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and

ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.



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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

- g) The responsible party shall:
 - 1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
 - 2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
 - 3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

I) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):

20. For Test Projects subject to 310 CMR 10.05(11), the applicant shall also implement the monitoring plan and the restoration plan submitted with the Notice of Intent. If the conservation commission or Department determines that the Test Project threatens the public health, safety or the environment, the applicant shall implement the removal plan submitted with the Notice of Intent or modify the project as directed by the conservation commission or the Department.

4



WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP: CE225-0442 MassDEP File #

eDEP Transaction # Millis City/Town

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1.	Is a municipal	wetlands bylav	v or ordinance	applicable?	\boxtimes	Yes	🗌 No	
----	----------------	----------------	----------------	-------------	-------------	-----	------	--

- 2. The MILLIS hereby finds (check one that applies): Conservation Commission
 - a. I that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

1. Municipal Ordinance or Bylaw

2. Citation

2. Citation

Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

b. X that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:
 Wetlands Protection Bylaw
 Article XIX

1. Municipal Ordinance or Bylaw

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

See Special Conditions Attached

DEP FILE NO. CE 225-0442 VILLAGE/BIRCH ST. WELL #3 TREATMENT PLANT

SPECIAL CONDITIONS

- 21. Attention is called to General Condition #9 which requires the filing of this Order of Conditions at the Registry of Deeds. The applicant **must submit proof of recording prior to commencing any work**. At the time of each sale, the Millis Conservation Commission shall be notified as to the name and address of the owner so that the Conservation Commission can provide guidance for the maintenance of wetlands.
- 22. Erosion control barrier; erosion control fencing/bio-fence (silt fence buried twelve inches below surface grade; staked), sedimentation barriers, etc., shall be placed as shown and noted on the approved plan. Once all erosion controls are in place, contact the Commission for inspection prior to start of construction. Per General Condition #18, erosion controls must be inspected and maintained until a Certificate of Compliance is issued. After issuance of a Certificate of Compliance, all erosion controls must be removed by applicant.
- 23. Wetland flagging shall be maintained until a Certificate of Compliance is issued.
- 24. All work to be performed under this Order of Conditions shall conform to the Massachusetts Department of Transportation – Highway Division "Standard Specifications for Highways and Bridges" dated 2022, including supplemental specifications, and the approved Construction Standards of the Massachusetts DOT - Highway Division, including amendments, supplementary specifications and revisions or the specification Section 01568 for this project. Use whichever is more protective for the wetlands.
- 25. All cleared and grubbed material, except that used to replicate wetlands, shall be removed from the buffer zone and only clean, coarse gravel Shall be used as fill. Construction debris shall not be buried on site. All existing debris shall be removed from the site and disposed of in accordance with applicable State and local regulations.
- 26. If applicable, in order to maintain as near as possible the natural environment and to minimize erosion, no excess vegetation or trees shall be cleared beyond the area required for grading.
- 27. Care shall be taken during construction and in all placing of fill material to keep materials from being carried to the wetlands. General guidance is provided in Massachusetts Department of Environmental Protection document entitled "Massachusetts Erosion and Sediment Control for Urban and Suburban Areas."
- 28. The developer or contractor responsible for the project's completion shall be notified of and understand the requirements of this Order. A copy of the Order shall be on-site while activities regulated by the Order are being performed.

DEP FILE NO. CE 225-0442 VILLAGE/BIRCH ST. WELL #3 TREATMENT PLANT SPECIAL CONDITIONS

- 29. This Order shall apply to any successor in control or successor in interest of the property described in the Notice of Intent and accompanying plans.
- 30. Upon completion of the project, the Applicant shall submit with his/her request for a Certificate of Compliance (WPA Form 8A) a filing fee and an As-Built Plan prepared and stamped by a Professional Engineer or Land Surveyor, registered in the Commonwealth of Massachusetts. Said plan shall note any deviations from the plan referenced on Pg. 2, #8. In addition, a stamped 8 ½ x 11 inch Exhibit As-built Plan must be submitted.
- 31. Owner gives permission for the Conservation Commission or their representative to enter property for purposes of inspecting work progress, and to periodically inspect the drainage systems, stormwater controls, and wetland resource areas.
- 32. If the minimum distance between the resource area and the closest point of the structure(s) decreases, or if the minimum distance between the resource area and the area of disturbance decreases by ten (10%) percent or more, the applicant must come before the Commission to request a modification/amendment to this Order of Conditions. Failure to do so may result in complications for issuance of the Certificate of Compliance.
- 33. If the area of impervious surface or the area of disturbance (grading) within the buffer zone increases by more than ten (10%) percent from the approved proposed plan(s), the Applicant must come before the Commission to request a modification/amendment to this Order of Conditions. <u>Failure to do so may result in complications for issuance of the Certificate of Compliance</u>.
- 34. Sediment shall be removed before it reaches $\frac{1}{2}$ the height of the filter sock.

MASTER Updated 1-5-2022.doc



WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP: CE225-0442 MassDEP File #

eDEP Transaction	#
Millis	
City/Town	

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance. Please indicate the number of members who will sign this form.

This Order must be signed by a majority of the Conservation Commission.

2023

2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Sig S Signature Signature Sidi ature Signature Signature Signature

K by hand delivery on

11/20/2023

James A. Lederer Printed Name **Edward Chisholm** Printed Name **Carol Hayes Printed Name Christine Gavin** Printed Name John Steadman Printed Name Scott McPhee **Printed Name David Larsen** Printed Name Printed Name

by certified mail, return receipt requested, on

Date



WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP: CE225-0442 MassDEP File #

eDEP Transaction # Millis City/Town

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

4



WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP: CE225-0442 MassDEP File #

eDEP	Transaction #
Millis	
City/T	own

G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

MILLIS		
Conservation Commission		
Detach on dotted line, have stamped by the Regis Commission.		ubmit to the Conservation
То:		
MILLIS		
Conservation Commission		
Please be advised that the Order of Conditions for	or the Project at:	
Village Street/Birch Street	CE225-0442	
Project Location	MassDEP File Nur	nber
Has been recorded at the Registry of Deeds of:		
Norfolk		
County	Book	Page
for:		
and has been noted in the chain of title of the affe	Page	
In accordance with the Order of Conditions issue	d on:	
Date		
If recorded land, the instrument number identifyin	g this transaction	is:
Instrument Number		
If registered land, the document number identifying	ng this transaction	is:
Document Number		
Signature of Applicant		



not use the return key.

Massachusetts Department of Environmental Protection Bureau of Resource Protection - Wetlands **Request for Departmental Action Fee Transmittal Form** Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

A. Request Information

1. Location of Project

		a. Street Address	b. City/Town, Zip
		c. Check number	d. Fee amount
Important: When filling out forms on	2.	Person or party making request (if appropriate, na	me the citizen gr
the computer, use only the		Name	
tab key to move your		Mailing Address	
cursor - do		City/Town	5

	a. offeet Address	b. City/Town, Zip		
	c. Check number	d. Fee amount		
2.	Person or party making request (if appropriate, name the citizen group's representative):			
	Name			
	Mailing Address			
	City/Town	State	Zip Code	
	Phone Number	Fax Number (if	applicable)	
3.	Applicant (as shown on Determination of Applicability (Form 2), Order of Resource Area Delineatior (Form 4B), Order of Conditions (Form 5), Restoration Order of Conditions (Form 5A), or Notice of Non-Significance (Form 6)):			

Name		
Mailing Address		
City/Town	State	Zip Code
Phone Number	Fax Number (if applicable)	

B. Instructions

- 1. When the Departmental action request is for (check one):
 - Superseding Order of Conditions Fee: \$120.00 (single family house projects) or \$245 (all other projects)
 - Superseding Determination of Applicability Fee: \$120
 - Superseding Order of Resource Area Delineation Fee: \$120

4.

DEP File Number:

Provided by DEP



Massachusetts Department of Environmental Protection Bureau of Resource Protection - Wetlands Request for Departmental Action Fee Transmittal Form Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

Provided by DEP

B. Instructions (cont.)

Send this form and check or money order, payable to the Commonwealth of Massachusetts, to:

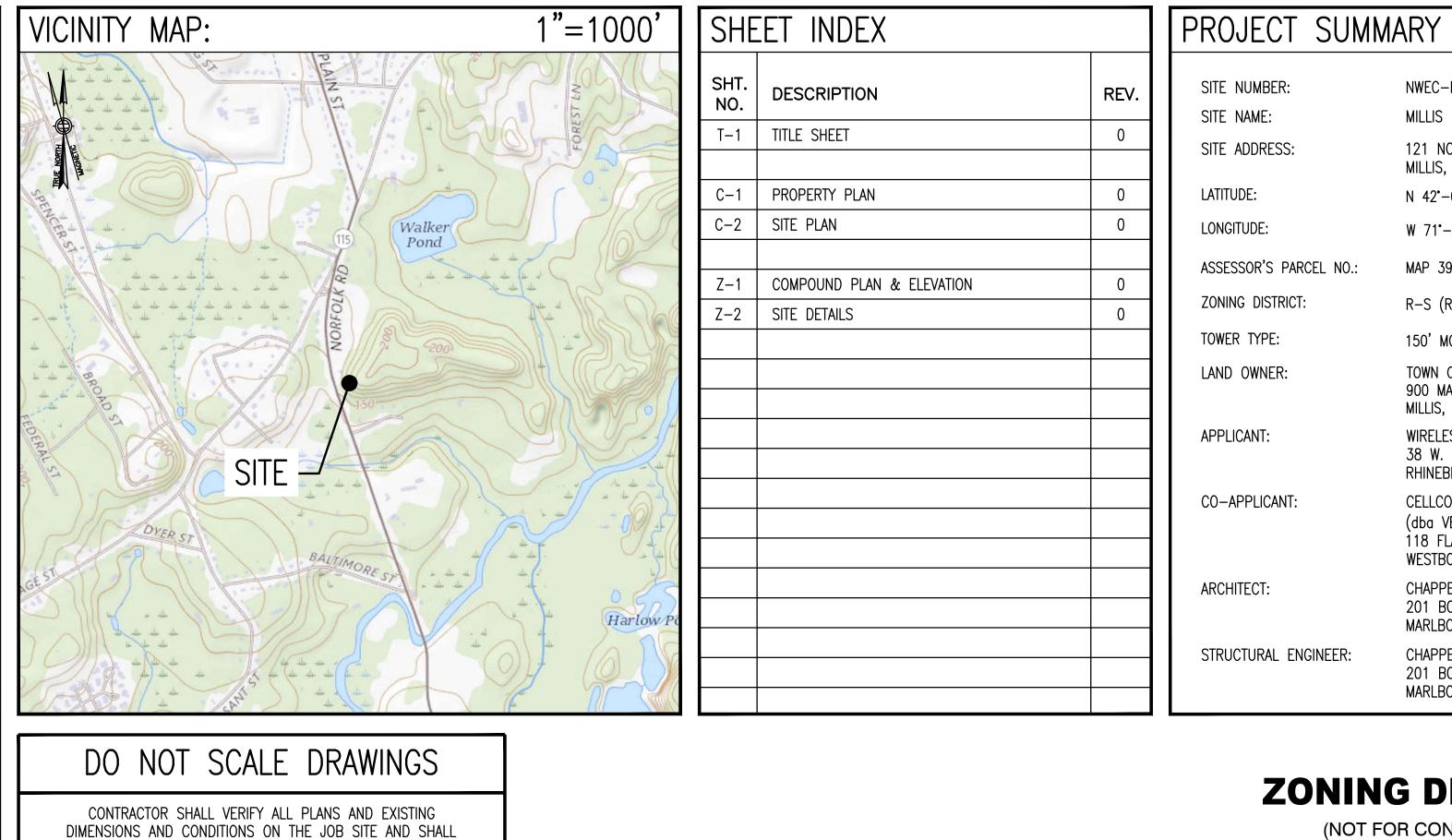
Department of Environmental Protection Box 4062 Boston, MA 02211

- 2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.
- Send a copy of this form and a copy of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP Regional Office (see <u>https://www.mass.gov/service-details/massdep-regional-offices-by-community</u>).
- 4. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

GENERAL NOTES

- . THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
- THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
- 3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE PROJECT OWNER'S REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXTENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.
- 4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
- 5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- 6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT DOCUMENTS.
- 7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
- 8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.

- 9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
- 10. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY CONSTRUCTION CONTROL SURVEYS, ESTABLISHING AND MAINTAINING ALL LINES AND GRADES REQUIRED TO CONSTRUCT ALL IMPROVEMENTS AS SHOWN HEREIN.
- 11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
- 12. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
- 13. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
- 14. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
- 15. THE CONTRACTOR SHALL NOTIFY THE PROJECT OWNER'S REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE PROJECT OWNER'S REPRESENTATIVE.
- 16. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB. 17. ALL UNDERGROUND UTILITY INFORMATION WAS
- DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK. CALL THE FOLLOWING FOR ALL PRE-CONSTRUCTION NOTIFICATION 72-HOURS PRIOR TO ANY EXCAVATION ACTIVITY: DIG SAFE SYSTEM (MA, ME, NH, RI, VT): 1-888-344-7233 CALL BEFORE YOU DIG (CT): 1-800-922-4455





MILLIS SITE ID: WEC-MA-07

121 NORFOLK ROAD MILLIS, MA 02054

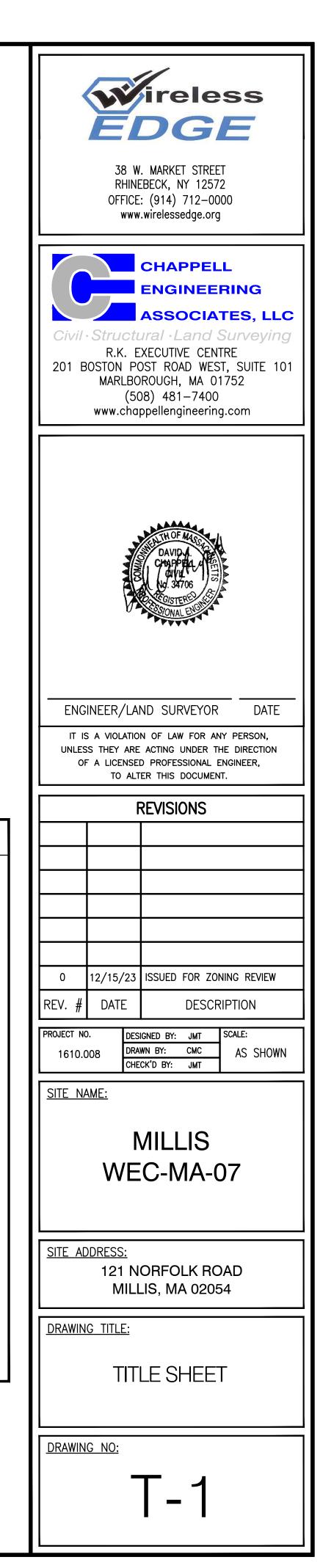
SITE TYPE: 150' MONOPOLE

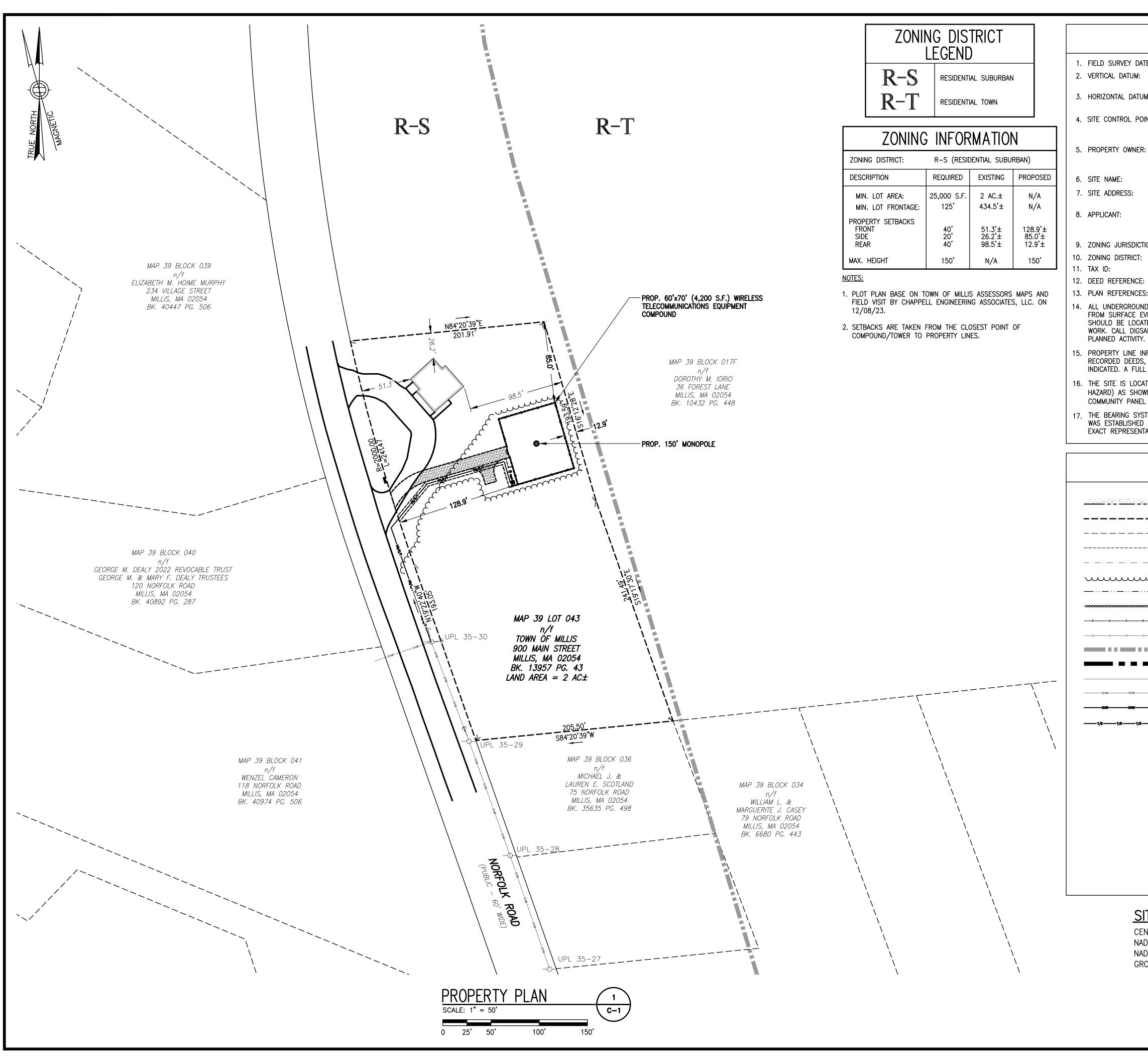
IMMEDIATELY NOTIFY THE PROJECT OWNER'S REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

	NWEC-MA-07
	MILLIS
	121 NORFOLK ROAD MILLIS, MA 02054
	N 42°-09'-04.07"
	W 71°-21'-08.09"
RCEL NO.:	MAP 39 LOT 043
T:	R–S (RESIDENTIAL SUBURBAN)
	150' MONOPOLE
	TOWN OF MILLIS 900 MAIN STREET MILLIS, MA 02054
	WIRELESS EDGE TOWERS II, LLC 38 W. MARKET STREET RHINEBECK, NY 12572
	CELLCO PARTNERSHIP (dba VERIZON WIRELESS) 118 FLANDERS ROAD WESTBOROUGH, MA 01581
	CHAPPELL ENGINEERING ASSOCIATES, LLC 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752
NGINEER:	CHAPPELL ENGINEERING ASSOCIATES, LLC 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752

ZONING DRAWINGS

(NOT FOR CONSTRUCTION)





<u>GENERAL NOTES</u>

VEY DATE:	12/05/23
DATUM:	NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)
L DATUM:	NORTH AMERICAN DATUM OF 1983 (NAD83)
ROL POINT	CENTER OF PROPOSED TOWER LATITUDE: N42'-09'-04.07" LONGITUDE: W71'-21'-08.09"
OWNER:	TOWN OF MILLIS 900 MAIN STREET MILLIS, MA 02054
:	MILLIS (WEC-MA-07)
ESS:	121 NORFOLK ROAD MILLIS, MA 02054
	WIRELESS EDGE TOWERS II, LLC 38 W. MARKET STREET RHINEBECK, NY 12572
RISDICTION:	TOWN OF MILLIS
STRICT:	R—S (RESIDENTIAL SUBURBAN) MAP 39 LOT 043
RENCE:	BOOK 13957 PAGE 43
RENCES:	TOWN OF MILLIS ASSESSOR/GIS MAPS

14. ALL UNDERGROUND UTILITY INFORMATION PRESENTED HEREON WAS DETERMINED FROM SURFACE EVIDENCE AND PLANS OF RECORD. ALL UNDERGROUND UTILITIES SHOULD BE LOCATED IN THE FIELD PRIOR TO THE COMMENCEMENT OF ANY SITE WORK. CALL DIGSAFE 1-888-344-7233 A MINIMUM OF 72 HOURS PRIOR TO PLANNED ACTIVITY.

15. PROPERTY LINE INFORMATION IS COMPILED FROM TOWN/CITY ASSESSORS PLANS, RECORDED DEEDS, LIMITED FIELD SURVEY, AND PLANS OF REFERENCE AS INDICATED. A FULL BOUNDARY SURVEY WAS NOT PERFORMED.

16. THE SITE IS LOCATED IN FLOOD HAZARD ZONE X (AREAS OF MINIMAL FLOOD HAZARD) AS SHOWN ON FLOOD INSURANCE RATE MAP FOR THE TOWN OF MILLIS, COMMUNITY PANEL 25021C 0163E DATED 07/17/2012.

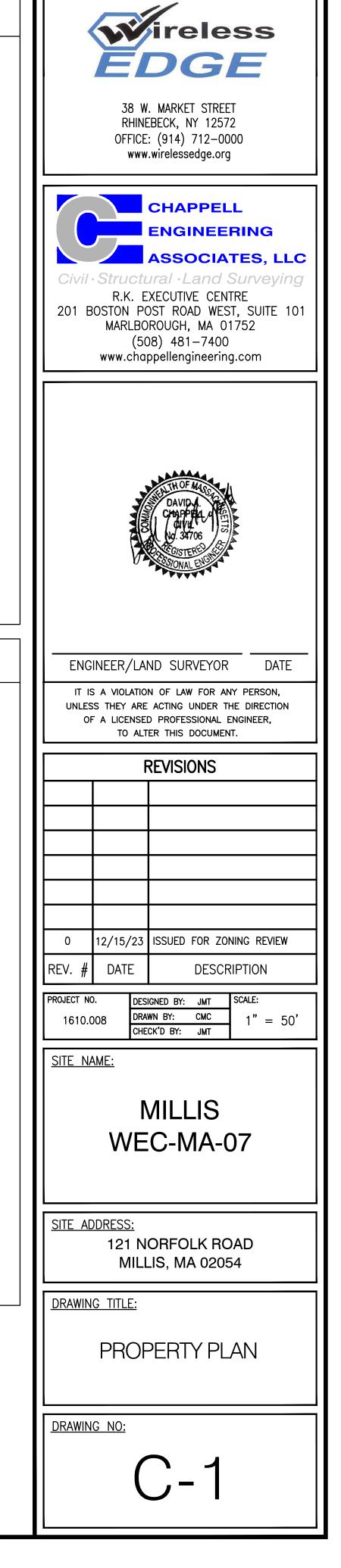
17. THE BEARING SYSTEM OF THIS PLAN IS BASED ON GRID NORTH. GRID NORTH WAS ESTABLISHED FROM GPS OBSERVATIONS. IT IS NOT INTENDED TO BE AN EXACT REPRESENTATION OF TRUE NORTH.

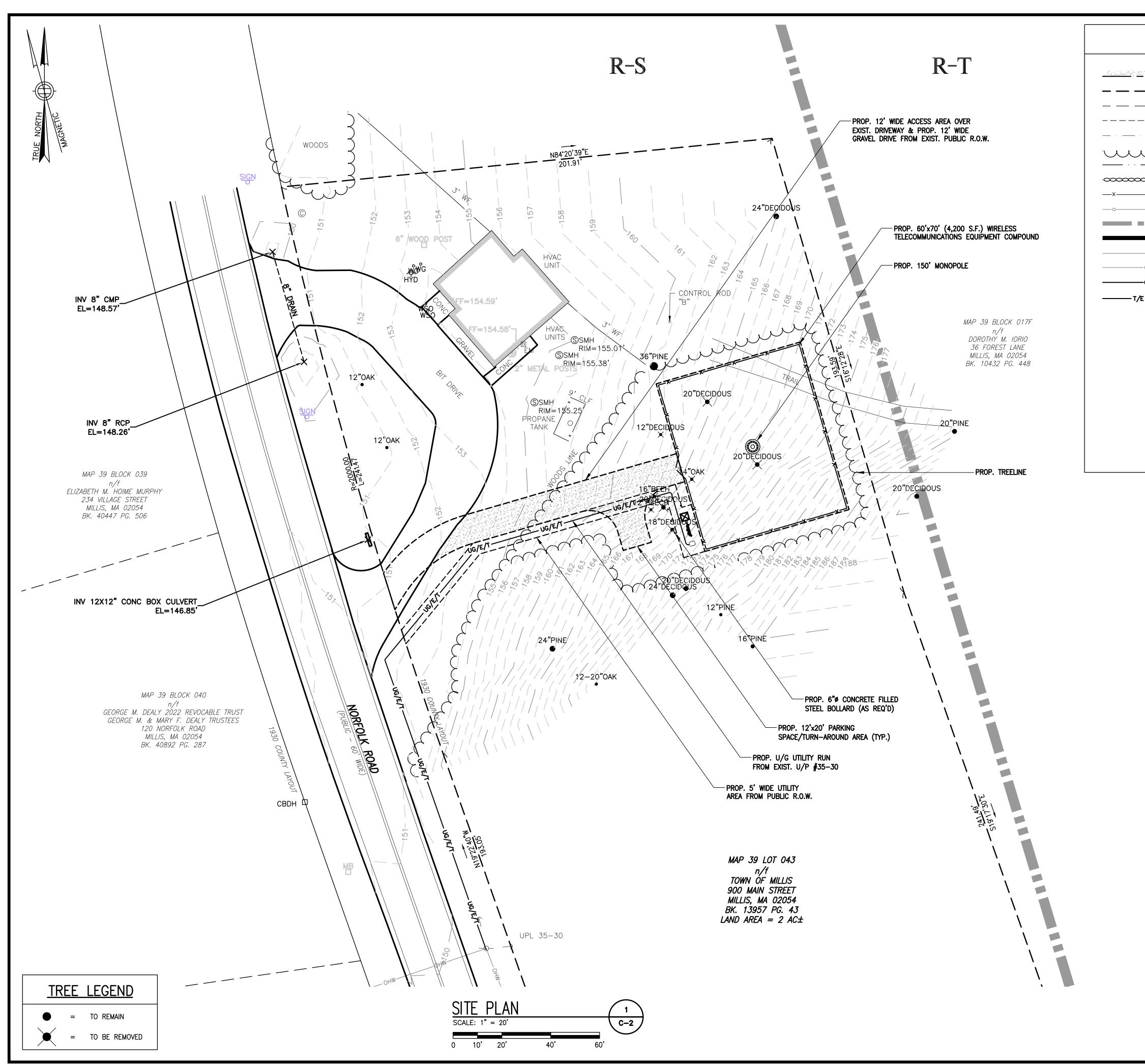
<u>LEGEND</u>

	EXISTING ROW/EASEMENT
	PROPERTY LINE
	ABUTTING PROPERTY LINE
	EXIST. EASEMENT
- · · · · · · · ·	PROPERTY OFFSET LINE
······································	EXIST. TREELINE
··· _ ·· _ ·· _ ·· _ ·· _ ·· _ ·· _ ··	EXIST. WETLANDS
	EXIST. STONEWALL
_xxxxx	EXIST. CHAIN LINK FENCE
-0000	EXIST. STOCKADE FENCE
	ZONING BOUNDARY
	TOWN LINE
	EXIST. EDGE OF PAVEMENT
	EXIST. OVERHEAD UTILITIES
	PROP. OVERHEAD UTILITIES
	PROP. UTILITIES
С	EXIST. UTILITY POLE
X	HYDRANT
	DRILL HOLE
\Box	STONE/CONC. BOUND
\bigcirc	TELCO MANHOLE
S	SEWER MANHOLE
\bigotimes	WATER MANHOLE
\bigcirc	DRAINAGE MANHOLE
	CATCH BASIN
сv Х	GAS VALVE
wv ⊠	WATER VALVE

SITE CONTROL POINT

CENTER OF PROPOSED MONOPOLE NAD 83 LATITUDE: N.42° 09' 04.07" NAD 83 LONGITUDE: W.71° 21' 08.09" GROUND ELEVATION: 169.0'±

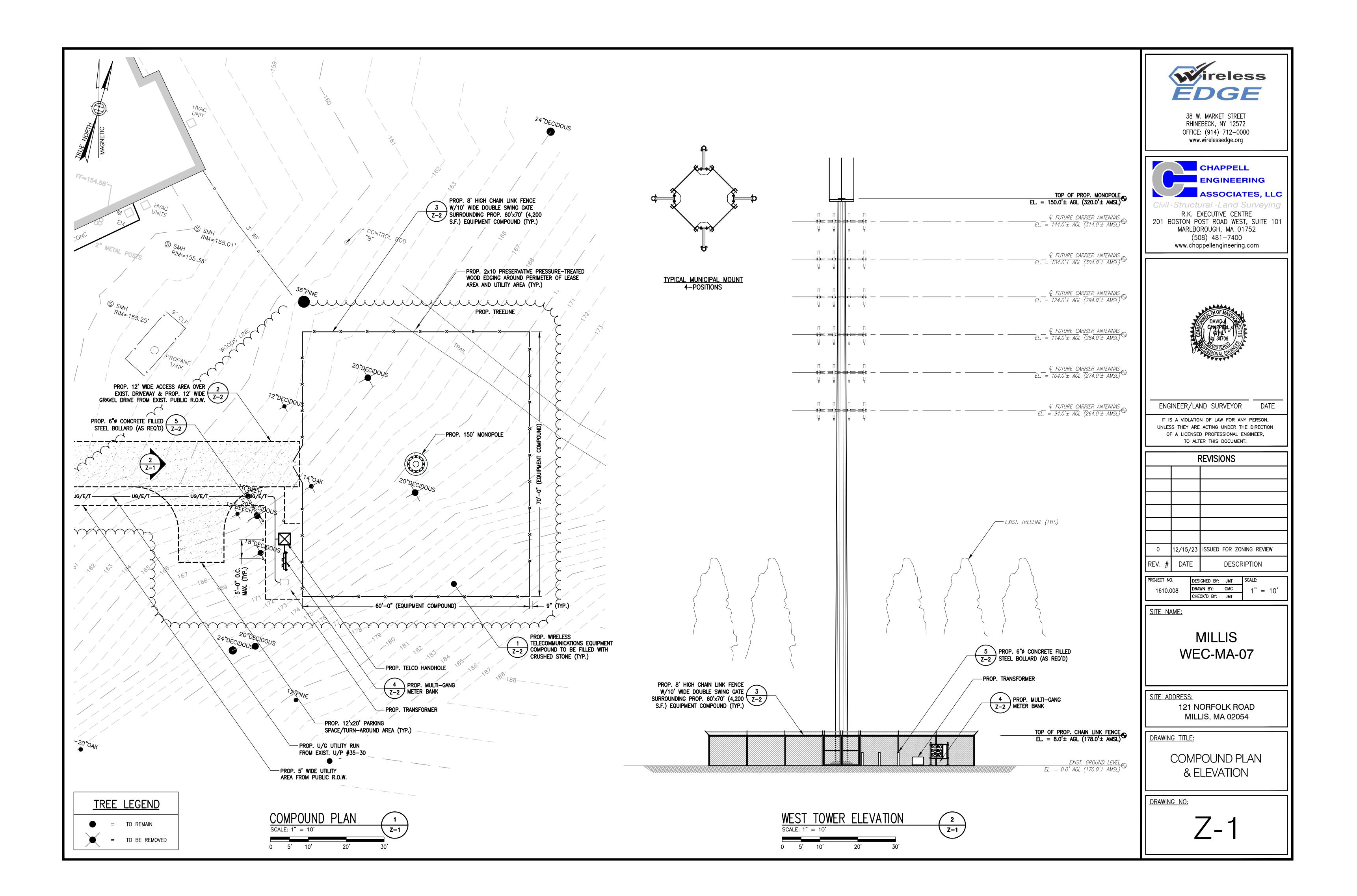


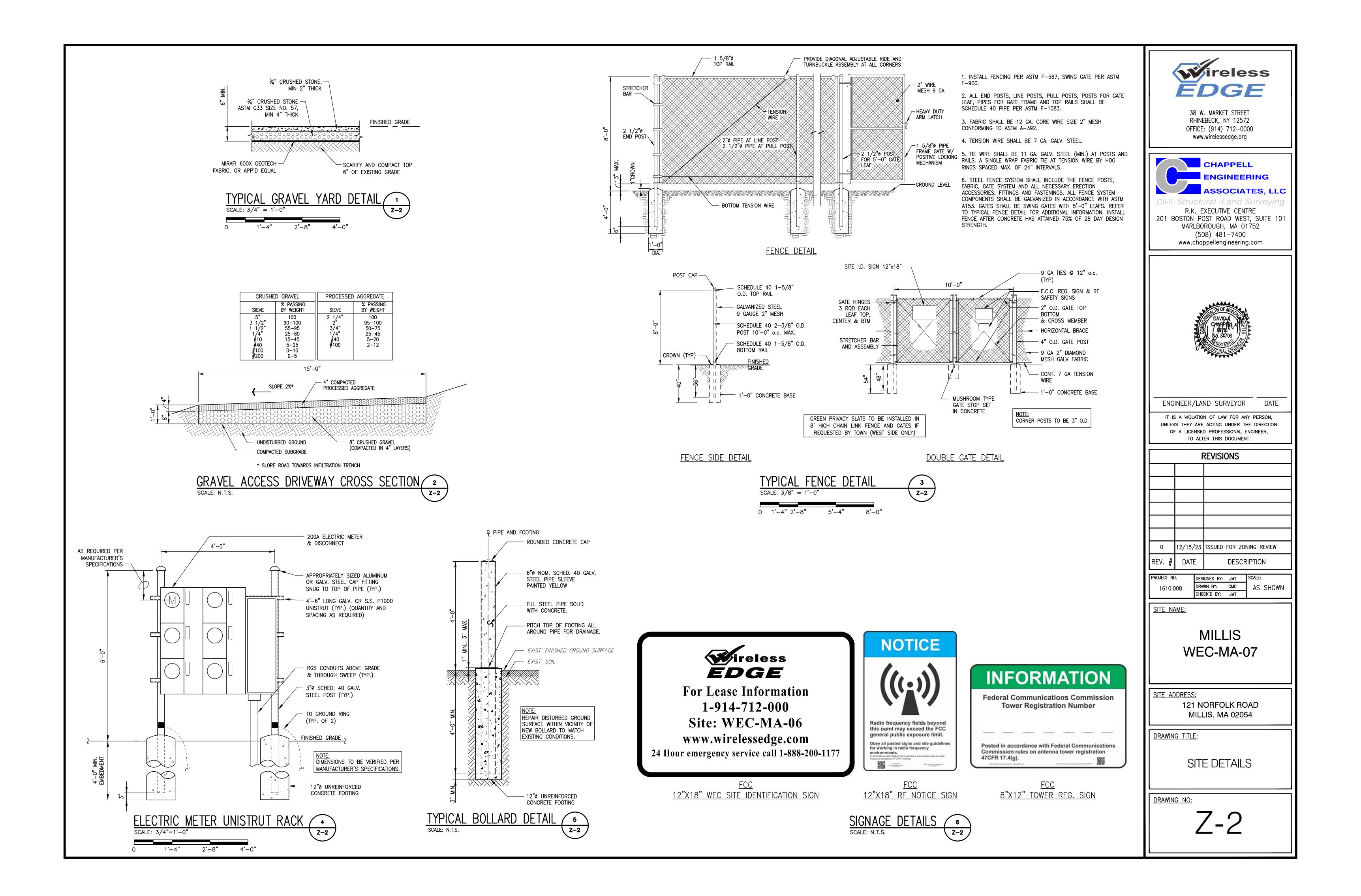


<u>LEGEND</u> **EDGE** EXISTING ROW/EASEMENT PROPERTY LINE 38 W. MARKET STREET RHINEBECK, NY 12572 ABUTTING PROPERTY LINE EXIST. EASEMENT OFFICE: (914) 712-0000 _____ www.wirelessedge.org PROPERTY OFFSET LINE EXIST. TREELINE EXIST. WETLANDS CHAPPELL EXIST. STONEWALL ENGINEERING EXIST. CHAIN LINK FENCE ASSOCIATES, LLC EXIST. STOCKADE FENCE vil·Structural ·Land Surveying ZONING BOUNDARY R.K. EXECUTIVE CENTRE 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752 TOWN LINE EXIST. EDGE OF PAVEMENT (508) 481-7400 www.chappellengineering.com EXIST. OVERHEAD UTILITIES PROP. OVERHEAD UTILITIES PROP. UTILITIES — T/E — EXIST. UTILITY POLE പ HYDRANT DRILL HOLE STONE/CONC. BOUND TELCO MANHOLE SEWER MANHOLE WATER MANHOLE DRAINAGE MANHOLE CATCH BASIN GAS VALVE WATER VALVE DATE ENGINEER/LAND SURVEYOR ZONING DISTRICT IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION LEGEND OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT. R-S RESIDENTIAL SUBURBAN REVISIONS R-T RESIDENTIAL TOWN SITE CONTROL POINT CENTER OF PROPOSED MONOPOLE NAD 83 LATITUDE: N.42° 09' 04.07" NAD 83 LONGITUDE: W.71° 21' 08.09" GROUND ELEVATION: 169.0'± 12/15/23 ISSUED FOR ZONING REVIEW 0 REV. # DATE DESCRIPTION DESIGNED BY: JMT SCALE: PROJECT NO. DRAWN BY: CMC 1" = 20' 1610.008 CHECK'D BY: JMT <u>SITE NAME:</u> MILLIS WEC-MA-07 <u>SITE ADDRESS:</u> 121 NORFOLK ROAD MILLIS, MA 02054 DRAWING TITLE: SITE PLAN

DRAWING NO:

C-2







TOWN OF MILLIS

OFFICE OF THE PLANNING BOARD

900 Main Street • Millis, MA 02054 Phone: 508-376-7045 https://www.millisma.gov/planning-board Richard Nichols, Chair Nicole Riley, Clerk Bodha B. Raut Chhetry Alan Handel James McKay George Yered, Associate

Camille Standley Administrative Assistant cstandley@millisma.gov

SPECIAL PERMIT APPLICATION FOR/WITH SITE PLAN APPROVAL PERSONAL WIRELESS COMMUNICATIONS FACILITIES

To the Millis Planning Board:

The undersigned hereby petitions the Planning Board for a Special Permit and Site Plan Approval under Section XIII.C and N. of the Town of Millis Zoning By-Law.

Applicant's Name: Wireless EDGE Towers II, LLC

Address c/o Michael R. Dolan, Esq., Brown Rudnick, LLP, One Financial Center

Town Boston State/Zip MA/02111 Phone 617-856-8548 Email: mdolan@brownrudnick.com

Property Location 121 Norfolk Road

Assessors' Map 39

Parcel 43

Zoning District(s) Residential Suburban

Owner's Name Town of Millis

Address 900 Main Street

Town Millis State/Zip MA/02054 Phone (508) 376-7040

Summary of Work to be Done: Construct a 150' above ground level monopole style communications tower (the "Tower") with space for the antennas of The Town of Millis on the top plus at six (6) different lower elevations space for the antennas of wireless telecommunications companies together with their related amplifiers, cables, fiber and other associated antenna equipment, including remote radio heads, surge arrestors, and global positioning system antennas, plus the installation of a 4,200 sq ft compound enclosed by an 8' high chain linked fence for the location of electronic equipment, cabinets and other appurtenances, and the installation of an access drive, parking turnaround, steel bollards, pressure treated wood edging, as well as a transformer, meter bank, and underground conduit and utilities, with all proposed improvements as more particularly shown and described in the plans included with this application.

Signature of Applicant Date 12 (SrA) Millis Town Clerk Date_12-201-03 Signature of Land Owner-ceived 15 2023

Rev.October 2023 65198728 v1-WorkSiteUS-033480/0005

Millis Town Clerk Received

5

<u>Checklist for Personal Wireless Application for Site Plan App</u> <u>Submission</u>

Completed

1. Completed Application (signed by Town Clerk)

2. Certified Abutters List from the Assessor's Office (within 300')

- Application Fee of \$350.00
 *Consultant Review Fee: \$2,500.00
 Make checks payable: "Town of Millis"
- 7 copies of the site plan as specified in Section XIII.C of the Town of Millis Zoning By-Law (1 Full-sized; 6 - 11"x 17"; and an electronic copy)
- 5. Send one copy of all submittal requirements to the Board's independent engineer (to include 1 full-sized set of plans):

GCG Associates 84 Main Street Wilmington, MA 01877 Office: (978) 657-9714 Ext. 211 Attn: Michael Carter, PE www.gcgassociates.net

*Consultant Review Fees: Initial submittal of \$2,500.00 is to accompany application. Please note that once the submittal is received by GCG Associates, the Board's consulting engineers, a Scope & Fee will be prepared. The applicant is responsible for all consultant review fees in excess of the initial deposit of \$2,500.00.

A complete copy of the filing/plans, etc. must be emailed electronically to the Planning Board. The Planning Board public hearing will be scheduled upon receipt of completed application which includes all documentation, plans and fees.

brownrudnick

Michael R. Dolan, Esq. direct dial: : +1 617.856.8548 mdolan@brownrudnick.com

December 13, 2023

Town of Millis Planning Board c/o Camille Standley, Administrative Assistant 900 Main Street Millis, MA 02054

RE:

Applicant:

Site:

Owner:

Facility:

Relief Requested:

Supplement to Special Permit and Site Plan Approval Application for a Personal Wireless Communications Facility (the "Application")

Wireless EDGE Towers II, LLC ("Wireless Edge" or the "Applicant") c/o Michael R. Dolan, Brown Rudnick LLP, One Financial Center, Boston, MA 02111

121 Norfolk Road, Millis, MA (Assessor's Parcel Map 39 Lot 43) (the "Site")

Town of Millis

Construct a 150' above ground level monopole style communications tower (the "Tower") with space for the antennas of The Town of Millis on the top plus at six (6) different lower space for the antennas of multiple wireless elevations telecommunications companies together with their related amplifiers, cables, fiber and other associated antenna equipment, including remote radio heads, surge arrestors, and global positioning system antennas, plus the installation of a 4,200 sq ft compound enclosed by an 8' high chain linked fence for the location of electronic equipment, cabinets and other appurtenances. and the installation of an access drive, parking turnaround, steel bollards, pressure treated wood edging, as well as a transformer, meter bank, and underground conduit and utilities; all proposed improvements as more particularly shown and described in the plans included with the Application (the foregoing collectively hereinafter referred to as the "Facility")

Special Permit and Site Plan Approval pursuant to Section XIII C. and N. and Section XII Q. of the Town of Millis Zoning By-law (hereinafter, the "By-law"), Massachusetts General Laws chapter 40A, and the federal Telecommunications Act of 1996 (the "TCA") for the construction, operation, and maintenance of a Personal Wireless Communications Facility, and such other relief as deemed necessary, all rights reserved.



Dear Honorable Members of the Millis Planning Board (the "Board"):

We represent Wireless Edge in connection with the Application before the Board. The Site is owned by the Town of Millis (the "Owner"). Wireless Edge respectfully requests the Board's approval to construct the above-referenced Facility pursuant to the By-law. The Facility is shown on the plans attached hereto and incorporated herein by reference (the "Plans"). Additionally, Wireless Edge has agreed to allow the Town of Millis to install communications antennas and equipment on and adjacent to the Tower, free of charge.

BACKGROUND

Wireless Edge owns and manages wireless communication infrastructure in the United States. Wireless Edge leases space to FCC licensed wireless communications services providers (each a "Carrier" and together the "Carriers") and other users of wireless technology. Wireless Edge strives to be a good neighbor to the communities within which it has communication sites.

Wireless Edge has entered into a lease agreement with the Town of Millis pursuant to a request for proposals. Carriers will lease space on the Tower and within the fenced compound from Wireless Edge and will be subtenants at the Site.

The Applicant submits that the Site is well suited for a wireless communications facility and that the Site satisfies the intent and purposes of the By-law and the TCA, to the extent possible. As will be demonstrated through the Application materials and the written and oral evidence at the public hearing(s) in connection with the Application, the proposed Facility meets all applicable requirements of the By-law to the extent possible. The Facility will not significantly impact adjacent properties and neighborhoods as the Facility will in part be screened from view by sight lines blocked by existing tree cover and many of the surrounding properties are undeveloped. The location of the Facility will protect, to the extent practicable, the aesthetic qualities of the Town of Millis by utilizing a parcel of land that is especially suited to the proposed use due to the existing municipal use of the Site. The installation of the Facility will not be a threat to public health, safety and welfare. In fact, Applicant submits that the Facility will aid in public safety by providing much needed improved wireless communications services to the residents, businesses, commuters, and emergency personnel utilizing wireless communications in the immediate vicinity and along the nearby roads. Likewise, improved public safety communications will be available from the Tower. These services further the public interest of health and safety as they will aid with wireless 911 services to the community and communication services for the public. According to the FCC, more than 240 million 911 calls, or nearly two-thirds of all calls received by the 911 centers nationwide, are made annually from mobile handheld devices in the United States. Today, wireless infrastructure is required to assist with public safety needs.

The Facility will not generate objectionable noise, odor, fumes, glare, smoke, or dust. The Facility will have no negative impact on property values in the area. No significant increase in traffic or hindrance to pedestrian movements will result from the Facility. On average, only one or two round trip visits per month per Carrier are required to service and maintain the Facility. The only utilities required to operate this Facility are standard electrical power as well as communication service. The Facility will comply with all applicable local, state and federal



safety codes. This Facility does not require police or fire protection because the installation has its own monitoring equipment that can detect malfunction and/or tampering.

RELIEF REQUESTED

Wireless Edge respectfully requests that the Board grant a Special Permit and Site Plan Approval pursuant to Section XIII C. and N. and Section XII Q. of the By-law, Chapter 40A of the Massachusetts General Laws, and the TCA, for the construction, operation, and maintenance of a Personal Wireless Communications Facility, and such other relief as deemed necessary, all rights reserved. As will be further demonstrated by the Applicant by evidence submitted to the Board at the public hearing(s) in connection herewith, such relief is appropriate as the facility satisfies all pertinent provisions and standards contained in the By-law for the requested relief.

Without the requested approvals, FCC licensed wireless communications carriers would be unable to fill their existing significant gaps in coverage in this area of Millis, thereby creating a hardship recognized by the state and federal courts interpreting the TCA. The Site is located within the limited geographic area where radio frequency experts have determined that a wireless telecommunications facility is required. The Town of Millis issued a request for proposals seeking to lease the Site for a wireless telecommunications facility to help improve wireless communication coverage in this area of Millis.

COMPLIANCE WITH SECTION XII Q. (SPECIAL PERMITS) OF THE BY-LAW

- 1. Before granting an application for a special permit, the Special Permit Granting Authority, with due regard to the nature and condition of all adjacent structures and uses, and the district within which the same is located, shall find all of the following general conditions to be fulfilled.
 - a. Special permits shall only be issued following public hearings held within 65 days after filing of an application with the Special Permit Granting Authority, a copy of which shall be given forthwith to the Town Clerk by the applicant.

AT&T's application will be subject to a public hearing.

b. The use requested is listed in the <u>Table 1 Use Regulations</u> as a special permit in the district for which application is made or is so designated elsewhere in this By-Law.

Pursuant to the Table 1 Use Regulations, the Applicant's proposed use of the Site is designated in Accessory Uses # 18 "Personal Wireless Communications Facilities" and is permitted pursuant to the issuance of a Special Permit by the Planning Board.



c. The requested use is essential or desirable to the public convenience or welfare.

Applicant submits that the Facility will aid in public safety by helping to provide and improve wireless communication services to the residents, businesses, commuters, and emergency personnel utilizing wireless communications in the immediate vicinity and along the nearby roads. These services further the public interest of health and safety as it enables wireless 911 services to be better available to the community and communication services for the public. According to the FCC, more than 240 million 911 calls, or nearly two-thirds of all calls received by the 911 centers nationwide, are made annually from mobile handheld devices in the United States. See FCC Press Release entitled, "FCC takes Action to Improve Wireless 9-1-1 Services", dated September 23, 2010. Today, wireless infrastructure is required to assist with public safety needs. The Applicant submits that the proposed Facility will improve regular and emergency communications for police and fire personnel by reducing the number and frequency of dropped and incomplete calls due to weak signals and adding an additional layer of communication to traditional land lines. Additionally, published reports have highlighted the fact that during and after adverse major weather events, including ice storms, wireless telecommunications has been the only form of reliable communication. Lastly, the installation of the Facility at the Site will assist the Town of Millis in complying with its obligations under the TCA. Consistent with the By-law, the Facility will allow wireless communications providers to function within a local, regional, and national communications system.

d. The requested use will not create undue traffic congestion, or unduly impair pedestrian safety.

The Facility will not generate significant amounts of traffic. Trips to the Facility will average one or two per month per carrier by maintenance personnel who will park in the front proposed parking/turnaround shown on the plans. The Facility is not open to the public and thus pedestrian safety concerns are minimized.

e. The requested use will not overload any public water, drainage, or sewer system or any other municipal service to such an extent that the requested use or any developed use in the immediate area or in any other area of the town will be unduly subjected to hazards affecting health, safety, or the general welfare.



The Facility will be unmanned and will not require water or sewer facilities. The Facility will use standard electric and telephone services which will be brought to the Facility via underground conduit from an existing utility pole already on Site. The Facility will not add significant amounts of impervious surfaces to the Site as the drive and compound will be lined with crushed stone or gravel and there will be no changes to existing drainage systems as a result of the proposed Facility. The Facility will be constructed in accordance with all applicable local, state and federal rules, laws and regulations.

f. Any special regulations, for the use set fo1th in Section XI, are fulfilled.

The property is not located in a Special Flood Hazard District.

g. The requested use will not impair the integrity or character of the district or adjoining zones, nor be detrimental to the health, morals, or welfare.

The proposed Facility will be located upon a 2 acre parcel of land which is partially screened by existing tree and vegetative growth and is surrounded by many undeveloped parcels such that potential visual impacts are minimized and the aesthetic qualities of the Town of Millis are preserved. The Site is a municipally owned property upon which the location of a personal wireless communications facility could be expected. The proposed Facility will be a passive use and will not cause any nuisance such as unreasonable noise, vibration, smoke, odors, waste, glare or significant traffic and will not adversely impact upon natural or historic resources. The Facility will be constructed in conformance with all applicable state and local building standards.

h. A special permit granted under this By-Law shall lapse within one year, and including such time required to pursue or await the determination of an appeal, from the grant thereof, if a substantial use thereof has not sooner commenced except for good cause or, in the case of permit for construction, if construction has not begun by such date except for good cause.

The Applicant acknowledges this requirement and no response is required.

COMPLIANCE WITH SITE PLAN APPROVAL REQUIREMENTS IN SECTION XII C. FOR A SPECIAL PERMIT

- 5. In considering a special permit application under this section, the Planning Board shall evaluate the technical quality of the site plan to assure the advisability of approval after considering the following matters:
 - (a) Protection of adjoining premises against detrimental uses by provision for surface water drainage, sound and sight buffers and preservation of views, light and air;

The Facility will not add significant amounts of impervious surfaces to the Site as the drive and compound will be lined with crushed stone or gravel and there will be no changes to existing drainage systems as a result of the proposed Facility. The proposed Facility will be located upon a 2 acre parcel of land which is partially screened by existing vegetative growth and is surrounded by many undeveloped parcels such that potential visual impacts are minimized and the aesthetic qualities of the Town of Millis are preserved. The Site is a municipally owned property upon which the location of a personal wireless communications facility could be expected. The Facility will be designed to support multiple wireless communications facilities upon a single structure and thus minimize the overall number of towers needed within the area. The proposed Facility will be a passive use and will not cause any nuisance such as unreasonable noise, vibration, smoke, odors, waste, glare or significant traffic and will not adversely impact upon natural or historic resources.

(b) Convenience and safety of vehicular and pedestrian movement within the site, the location of driveway openings in relation to traffic or to adjacent streets and, when necessary, compliance with other regulations for the handicapped, minors and the elderly;

The Facility will not generate significant amounts of traffic. Trips to the Facility will average one or two per month per Carrier by maintenance personnel who will park in the front proposed parking/turnaround shown on the plans. The Facility will not be accessible to the public but will of course comply with all applicable federal, state and local regulations regarding the handicapped, minors and the elderly to the extent applicable.



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(c) Protection and enhancement of existing site features;

The Facility was located on the Site so as to protect and enhance site features to the maximum extent practicable. During construction, the Applicant will use good faith efforts to minimize the amount trees removed at the Site.

(d) Adequacy of the arrangement for parking and loading spaces in relation to the proposed uses of the premises;

The Facility will not generate significant amounts of traffic. Trips to the Facility will average one or two per month per carrier by maintenance personnel who will park in the front proposed parking/turnaround shown on the plans.

(e) Adequacy of the methods of disposal of refuse and other wastes resulting from the uses permitted on the site;

The Facility will not generate any waste and there will be no need for the disposal of refuse or other wastes.

(f) Relationship of structures and open spaces to the natural landscape, existing buildings and other community assets in the area and compliance with other requirements of this By-Law.

The proposed Facility will be located upon a 2 acre parcel of land which is partially screened by existing vegetative growth and is surrounded by many undeveloped parcels such that potential visual impacts are minimized and the aesthetic qualities of the Town of Millis are preserved. The Site is a municipally owned property upon which the location of a personal wireless communications facility could be expected.

(g) Protection of environmental features, particularly groundwater resources, on the site and in adjacent areas, adequate protection to prevent pollution of surface and grow1dwater, soil erosion, increased runoff, changes in groundwater recharge or elevation and flooding.

The Facility will not add significant amounts of impervious surfaces to Site as the drive and compound will be lined with crushed stone and there will be no changes to existing drainage systems as a result of the



proposed Facility. The Facility has been designed to minimize the impact on environmental features to the maximum extent practicable.

TOWER REMOVAL

The Applicant has a Lease with the Town for the use of the Site and upon the termination of the Lease, the Town may require the Applicant to remove the Tower and all other installations. Pursuant to the Lease, commencing upon the commencement of the construction of the Tower, the Applicant will provide the Town with a Tower Removal Bond for the faithful removal of the Tower upon the termination of the Lease in the amount of \$50,000. The surety on such Bond will be a duly authorized surety company licensed to do business in the Commonwealth of Massachusetts.

THE TELECOMMUNICATIONS ACT OF 1996 - THE TCA

Without the relief requested, the Applicant and the Carriers would be unable to provide adequate coverage by filling existing significant gaps in coverage, thereby creating a hardship recognized by federal and state courts interpreting the TCA. The Site is located within the limited geographic area whereby the Carriers radio frequency engineers have determined that a wireless facility is required. Federal courts interpreting the TCA have held that where an applicant for the installation of wireless communications facilities to provide communications services seeks zoning relief as required by the municipal zoning ordinance, federal law imposes substantial restrictions affecting the standard for granting the requested relief. The TCA provides that: no laws or actions by any local government or planning or zoning board may prohibit, or have the effect of prohibiting, the placement, construction, or modification of communications towers, antennas, or other wireless facilities in any particular geographic area, see 47 U.S.C. §332(c)(7)(B)(i); local government or planning or zoning boards may not unreasonably discriminate among providers of functionally equivalent services, see 47 U.S.C. §332(c)(7)(B)(i); health concerns may not be considered so long as the emissions comply with the applicable standards of the FCC, see 47 U.S.C. §332(c)(7)(B)(iv); and, decisions must be rendered within a reasonable period of time, see 47 U.S.C. §332(c)(7)(B)(ii) and the FCC's Declaratory Ruling commonly referred to as the "shot clock".

In Omnipoint Holdings, Inc. v. City of Cranston, 586 F.3d 38 (1st Cir. 2009), the First Circuit Court of Appeals held that an effective prohibition occurs if a carrier demonstrates a significant gap in coverage and has investigated other viable alternatives. The factors the Court considered in judging the feasibility an alternative solution include whether the alternative solution is: technically efficient or at least technically adequate; economically feasible; and preferred by local authorities. Likewise, the court considers the level of willingness to cooperate. In Nextel Communications of the Mid-Atlantic v. Wayland, 231 F.Supp.2d 396 (D. Mass. 2002) and Omnipoint Communications MB Operations, LLC v. Town of Lincoln, 107 F. Supp. 2d 108 (D. Mass. 2000), the courts held that a municipality must approve a wireless facility if denying the petition would result in a "significant gap" in wireless services within a municipality because such denial would amount to an effective prohibition of wireless services. See 47 U.S.C.§332 (c) (7) (B) (i) (II). The court recognized that "an effective prohibition can



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exist even where a town allows for the erection of [wireless communications facilities] but subject to criteria which would result in incomplete wireless services within the town, i.e., significant gaps in coverage within the town." <u>Town of Lincoln</u>, 107 F. Supp. 2d at 117. Therefore, if an applicant establishes that the proposed facility would fill a significant gap in its wireless service coverage and is the least intrusive, feasible and only means reasonably available to accomplish that end, then the municipality must approve the requested zoning relief.

Of significance to the Board, courts have ordered the municipality to issue the necessary permits to allow the construction of the tower as described in the petition for zoning relief, foregoing an opportunity for the municipality to impose reasonable conditions on the wireless communications installation. Further, the Wayland court held that the need for closing a significant gap in coverage, to avoid an effective prohibition of wireless services, constitutes another unique circumstance when a zoning variance is required. We note that in the case of Sprint Spectrum L.P. v. Town of Swansea, Civil Action No. 07-12110-PBS, June 26, 2008, the federal District Court for Massachusetts held that notwithstanding the town zoning bylaw or Massachusetts state law, towns have the authority and obligation to grant use variances to avoid violating the TCA. In a growing number of cases, the federal courts have found that variance denials violate the TCA, even if such denials would be valid under state law. For example, in Omnipoint Communications v. Town of Lincoln 107 F. Supp. 2d 108 (D. Mass. 2000), the court found that denial of a variance for a location outside of the town's wireless overlay district violated the TCA and ordered the variance to issue despite a by-law provision prohibiting use variances. Additionally, in Nextel Communications of the Mid-Atlantic, Inc. v. Town of Wayland, 231 F. Supp. 2d 396 (D. Mass. 2002), the court reached the same result. In that case, the court stated: "Although the Board's statement [regarding its lack of authority to issue a use variance] may be a correct statement in Massachusetts regarding variances, it is not controlling in the special case of wireless communications facilities...under the Telecommunication Act, the Board cannot deny the variance if in so doing it would have the effect of prohibiting wireless services."

CONCLUSION

As evidenced by the materials submitted with this Application and as will be further demonstrated by the Applicant through evidence submitted to the Board at the public hearing(s) in connection herewith, in light of the TCA the Facility satisfies the intent and objectives of the By-law. The Tower is designed and sited to maximize collocation while minimizing, to the extent possible, adverse impacts to the surrounding neighborhood and the Town of Millis as a whole. The Facility will not have any adverse effect on property values in the area. The Facility will not be dangerous to the public health or safety as it is designed to comply with all applicable requirements of the Massachusetts building code. The Facility is a passive use, and will not cause any nuisance such as unreasonable noise, vibration, smoke, odor or dust. Further, the Facility will improve communication coverage to residents, commercial establishments and visitors to and through the area and improves call connections in this area of the Town of Millis. This Facility will greatly improve emergency communications for public safety personnel by reducing the number and frequency of dropped and incomplete calls due to weak signals and adding an additional layer of communication to traditional land lines. The Facility will provide a rental revenue stream to the Town and assist with critical municipal communications antenna



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infrastructure at no cost to the residents to the Town of Millis. Lastly, the installation of the Facility at the Property will assist the Town of Millis in complying with its obligations under the TCA.

Wireless Edge respectfully requests that the Board grant a Special Permit and Site Plan Approval to install, operate and maintain the Facility. We respectfully submit that the standards for a Special Permit and Site Plan Approval as set forth in the By-law as well as Massachusetts law must be interpreted and applied such that the decision issued by the Board is in conformance with the TCA. Accordingly, a denial of the foregoing petition would effectively prohibit Carriers from providing adequate service to the Town of Millis and thus would be contrary to the purpose and intent of the TCA and the By-law.

Respectfully submitted,

BROWN RUDNICK LLP

By: Michael R. Dolan (SMA)

65198490 v2-WorkSiteUS-033480/0005

Michael R. Dolan



MEMORANDUM

TO:	Town of Millis Conservation Commission
FROM:	Greg Avenia, P.E., Kleinfelder
DATE :	October 2023 (REVISED January 2024)
SUBJECT:	Millis Well 3 PFAS Treatment Facility Design, Village Street, Millis, MA 02054
CC:	Tyler Bernier, P.E., Kleinfelder

This Stormwater Management Report has been prepared to show compliance with the Massachusetts Stormwater Management Standards to support the Project's Notice of Intent Application.

The Town of Millis is proposing the installation of a 71' x 43' PFAS treatment facility to support Well 3 off Village Street in Millis, MA. The proposed development will also include the installation of above-ground backwash storage tanks, associated utilities including a tight tank sewer system, a paved driveway and an infiltration basin.

1 EXISTING DRAINAGE CONDITIONS

The proposed site is adjacent to the existing Well 3 facilities, southwest along the existing gravel driveway. The intersection of the gravel driveway and Birch Street is approximately 1,500 feet to the southwest. Under existing conditions, the proposed 31,581 square-foot site is mostly wooded. Wooded area borders the site to the south, the gravel driveway and wetland to the west, existing Well 3 infrastructure to the north, and a grassed field to the east past a loop in the gravel driveway.

The entirety of the site is within the Charles River watershed. Stormwater drains in two directions from a high point to the southeast of the proposed site. Approximately half of the site drains to the wetlands to the northwest, with the rest draining towards Maple Swamp located to the east. Both wetlands ultimately connect to the Charles River.

A boring log for the project site is attached to this report in Appendix **F**. In conjunction with this onsite boring, a monitoring well was installed to observe the seasonal changes in groundwater levels. The installation log of this well and an approximate location map are also included in Appendix **F**. The finish grade at the top of the monitoring well is approximately 126'. During construction of the well on March 10, 2023, groundwater was observed approximately 11.5 feet below the ground surface at elevation 114.5'.

During the design phase Kleinfelder conducted two additional field visits to measure the depth to groundwater throughout the year. On August 30, 2023, groundwater was observed 7.67' below the ground surface at elevation 118.33'. During a follow up visit on October 12, 2023, groundwater was measured 8.01' below the ground surface at elevation 117.99'. As a conservative measure and based on the significant



rainfall throughout 2024, seasonal high groundwater is estimated to be at or below elevation 120.00 in the vicinity of the proposed infiltration basin.

2 PROPOSED DRAINAGE CONDITIONS

Stormwater flows will emulate existing drainage conditions to the maximum extent possible, however a portion of the site that currently drains to the wetlands west of the site has been rerouted to the east to maximize water quality and quantity treatment via the proposed infiltration basin. Kleinfelder estimates that the proposed development will create approximately 7,510 square feet of new impervious area, comprised of the proposed treatment building, paved driveway, and concrete pad for above-ground backwash storage tanks. The existing chemical feed building will be demolished down to existing grade and the equipment will be relocated to the new treatment facility. The working area of the site will be graded to emulate existing grade at a maximum of 3:1 H:V slopes. The bottom elevation of the infiltration basin was limited due to the elevation of the groundwater table, approximately 118.33' as observed by Kleinfelder on August 30, 2023. To ensure appropriate separation to the groundwater table, the infiltration basin was restricted to a minimum elevation of 122'.

A stormwater swale along the existing gravel drive will capture the majority of runoff coming from the proposed building roof, the paved access drive, and concrete pad. The swale will direct stormwater to the proposed infiltration basin to the north of the site via an 8-inch pipe. Stormwater from the rear of the building will be directed to the proposed basin by a berm. The project site has been located and designed so that the impact within the 100-foot wetland buffer and 100-year flood zone are minimized to the maximum extent possible.

3 HYDROLOGIC ANALYSIS

A HydroCAD hydrologic analysis was performed under both existing and proposed conditions. Each model was analyzed for the 1, 2, 5, 10, 25, and 100-year storm events. Rainfall data was acquired from the Precipitation Frequency Data Server maintained by NOAA. The total watershed for the site was measured to be approximately 0.65 acres. Stormwater flow comes from an existing high point southeast of the project site and flows to the wetland to the west or to Maple Swamp to the east.

The soil data used for this analysis was acquired via the Web Soil Survey, provided by NRCS. Within the project site, areas not classified as water or impervious areas are generally hydrologic soil group A. Soils on the site are classified as very sandy loams and loamy sands.

For analysis of existing conditions, the site was divided into two main sub-watershed areas separated by a natural high point that extends across the project area, effectively dividing the site in half.

• SC-1 is approximately 24,786 square feet in area. It represents the western portion of the site and is comprised of woods in good conditions, unconnected impervious area, such as building roofs and



tank concrete pads, and gravel access road. Stormwater drains across the access drive to the wetland west of the site.

• SC-2 is approximately 19,349 square feet in area. It encompasses the easter portion of the site and drains to the east toward Maple Swamp. Ground cover in this area is entirely woods in good condition.

Under proposed conditions, the site was separated into five sub-watershed areas based on proposed drainage features and grading.

- SC-1 is approximately 3,356 square feet in area. It represents a portion of the site driveway the drains to the west before being captured by the proposed stormwater system. Ground cover in this area includes paved surfaces, gravel access drive, and grassed area.
- SC-2 is approximately 11,864 square feet in area. It encompasses most of the developed area of the site that flows to the west. Ground cover includes paved surface, concrete pads, building roofs, and grassed area. Stormwater from this area is captured by the proposed stormwater system and routed to an infiltration basin.
- SC-3 is approximately 9,595 square feet in area. This subcatchment area includes areas of direct flow from the north and east sides of the site into the infiltration basin. Ground cover includes grassed areas and the area of the infiltration basin, classified as water surface area.
- SC-4 is approximately 7,531 square feet in area. This encompasses the backside of the berm on the east side of the proposed infiltration basin, pressure relief outlet, and woods extending to the gravel road surrounding the site. Ground cover in this area is classified as a wood/grass combination.
- SC-5 is approximately 11,789 square feet in area. This represents the area on the west side of the site that is not captured by the stormwater system and flows directly to the western wetland. The ground cover in this area includes the existing well 3 building, the existing gravel access drive, and grassed area.

The watershed area has been standardized between the two analyses to allow direct comparison of the impact of the proposed development. Both models include two design points that are used to analyze and compare stormwater flow rates and volumes.

- Design Point 1, or "DP-1" represents the wetlands to the west of the project site.
- Design Point 2, or "DP-2" represents outflow from the project site to the east, ultimately into Maple Swamp.

4 MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (MASSDEP) – STORMWATER MANAGEMENT STANDARDS

As demonstrated below, the proposed Project complies with the MassDEP Stormwater Management Standards (the Standards) to the maximum extent practicable. Under the Stormwater Management Standards, the Project is considered a new develop project because it involves the construction of a new drinking water treatment facility. The Project has been designed to meet the Stormwater Management Standards to the maximum extent practicable and to improve upon existing conditions.



4.1 STANDARD 1: NO NEW UNTREATED DISCHARGES

No new stormwater conveyance (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

No change:

The Project has been designed to comply with Standard 1. Under existing conditions, there are no existing outfalls within the project area and no best management practices in place; runoff currently flows overland directly from the site to the wetlands to the west, or to Maple Swamp to the east. Under proposed conditions, a portion of the stormwater originally destined to flow from the site to the western wetlands will be intercepted by a proposed swale and rerouted to the proposed infiltration basin. On the eastern portion of the site, a berm will redirect runoff toward the proposed basin. No untreated discharges are proposed.

- A stone gabion basket weir is proposed to create a sediment forebay within the proposed infiltration basin to provide the required pretreatment.
- The infiltration basin will provide primary water quality treatment for this development. The basin has been sized to accommodate the 100-year 24-hour storm event for areas that drain to it. An emergency overflow weir with riprap erosion protection is proposed as a precautionary measure.

4.2 STANDARD 2: PEAK RATE ATTENUATION

Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.

Standard Met:

The Project has been designed to comply with Standard 2. The infiltration basin on the north side of the site will receive all the runoff from the impervious area added as a result of the development. The existing access road will be regraded near the proposed stormwater swale on the western side of the site to capture the maximum amount of runoff practicable. Areas that are not paved will be loamed and seeded at the end of construction.

A HydroCAD analysis was performed on both existing and proposed conditions, attached under **Appendix C**. A summary of this analysis in relation to standard 2 is below:

Design Storm	Existing Peak Flow (cfs)	Proposed Peak Flow (cfs)
1-Year	0.62	0.41
2-Year	0.77	0.51
5-Year	1.02	0.67
10-Year	1.23	0.81
25-Year	1.51	1.01
100-Year	1.95	1.38

TABLE 1: PEAK FLOWS AT DESIGN POINT 1



TABLE 2: PEAK FLOWS AT DESIGN POINT 2

Design Storm	Existing Peak Flow (cfs)	Proposed Peak Flow (cfs)
1-Year	0.00	0.00
2-Year	0.00	0.00
5-Year	0.00	0.00
10-Year	0.00	0.00
25-Year	0.01	0.00
100-Year	0.07	0.05

TABLE 3: TOTAL VOLUMES AT DESIGN POINT 1

Design Storm	Existing Total Storm Volume (ac-ft)	Proposed Total Storm Volume (ac-ft)
1-Year	0.048	0.032
2-Year	0.061	0.040
5-Year	0.082	0.055
10-Year	0.100	0.068
25-Year	0.127	0.086
100-Year	0.174	0.117

TABLE 4: TOTAL VOLUMES AT DESIGN POINT 2

Design Storm	Existing Total Storm Volume (ac-ft)	Proposed Total Storm Volume (ac-ft)
1-Year	0.000	0.000
2-Year	0.000	0.000
5-Year	0.000	0.000
10-Year	0.001	0.001
25-Year	0.005	0.003
100-Year	0.018	0.009

The post-development peak rates and volumes are equal to or less than the peak rates under existing conditions for all the analyzed storm events.

4.3 STANDARD 3: STORMWATER RECHARGE

Loss of annual recharge to groundwater shall be eliminated or minimized through the use of environmentally sensitive site design, low impact development techniques, stormwater management practices and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil types. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

Standard Met:

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The Project has been designed to comply with Standard 3. The proposed infiltration basin has 5,937 cubic feet of storage and can infiltrate the 100-year storm event for most of the project site. The required recharge volume calculation is included below.

TABLE 5: IMPERVIOUS AREA SUMMARY FOR STANDARD 3

Existing Impervious Area (sq. ft)	Proposed Impervious Area (sq. ft)	Change (sq. ft)
894	8,404	+7,510

The project site is surrounded by Hydrologic Soil Group A soils. Per the Massachusetts Stormwater Handbook, a recharge rate of 0.6 inches (0.05 feet) shall be used for all impervious area in areas with Hydrologic Soil Group A, the highest recharge rate outlined in the definition of Standard 3. When this rate is applied to the proposed additional impervious area of 0.18 acres or 7,753 square feet, the required recharge volume associated with this impervious area is calculated to 646 cubic feet. The proposed stormwater management system can store and infiltrate more than this required volume. See Appendix **E** for stormwater storage calculations.

4.4 STANDARD 4: WATER QUALITY

Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:

- a) Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained.
- b) Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and
- c) Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.

Standard Met:

The Project has been designed to comply with Standard 4. The project ultimately discharges to the Charles River (MA 72-05), a class 5 waterbody per Massachusetts 2022 Integrated List of Waters.

Table 3 shows the stormwater treatment provided for the proposed development. Water Quality Volumes were calculated for the first 1.0" of runoff per the Massachusetts Stormwater Handbook new development standards.

TABLE 4: REQUIRED WATER QUALITY VOLUME (WQV) AT DESIGN POINT 1

Watershed	Area	Required WQV	Provided WQV
Existing Total Impervious Area	894 sf	0 cf*	0 of
Proposed New Impervious Area (in addition to existing)	-354 sf	0 cf	0 cf

*To Max. Extent Practicable



TABLE 5: REQUIRED WATER QUALITY VOLUME (WQV) AT DESIGN POINT 2

Watershed	Area	Required WQV	Provided WQV
Existing Total Impervious Area	0 sf	0 cf*	2 249 of
Proposed New Impervious Area (in addition to existing)	7,864 sf	655 cf	3,348 cf

*To Max. Extent Practicable

A Long-Term Pollution Prevention Plan (LTPPP) and Operation & Maintenance Plan is included in Appendix D.

4.5 STANDARD 5: LAND USES WITH HIGHER POTENTIAL POLLUTANT LOADS (LUHPPLS)

For Land Uses with Higher Potential Pollutant Loads (LUHPPLs), source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all LUHPPLs cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from LUHPPLs shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

No change:

Standard 5 does not apply to the Project. There are no Land Uses with Higher Potential Pollutant Loads within the project area.

4.6 STANDARD 6: CRITICAL AREAS

Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "stormwater discharge" as defined in 314 CMR 3.04(2)(a)1 or (b), to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.

Standard Met:

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The project is within a Zone I Wellhead Protection Area. However, the proposed infiltration basin is sized to accommodate the 100-year 24-hour storm event without discharging to the surrounding area. An emergency overflow weir is provided as a precautionary measure but is not anticipated to see flow up to and including the 100-year storm event. Additionally, the project proposed is essential to the operation of a public water supply. Thus, Standard 6 is met.

4.7 STANDARD 7: REDEVELOPMENTS AND OTHER PROJECTS SUBJECT TO THE STANDARDS ONLY TO THE MAXIMUM EXTENT PRACTICABLE

A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

No substantive change:

The Project is considered a new development and is subject to all Standards 1 through 10.

4.8 STANDARD 8: CONSTRUCTION PERIOD POLLUTION PREVENTION AND EROSION AND SEDIMENTATION CONTROLS

A plan to control construction-related impacts, including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.

Standard Met:

The site plans call for the installation of sediment control barriers around the perimeter of the site to prevent off-site sediment transport. A construction exit will be provided to reduce transport of sediment off-site via construction traffic. All stockpiles will be surrounded with straw wattle during the earthwork phase of construction. A SWPPP will be prepared by the contractor prior to the onset of construction.

During construction, the contractor will be required to address any erosion issues that appear as a result of land disturbance. This may include the installation of additional sediment barrier, temporary erosion control matting, or temporary seeding. Erosion control measures will be repaired as necessary during construction. The contractor will be required to install and maintain all erosion control measures in accordance with the Massachusetts Stormwater Handbook.

Stormwater controls must be maintained in good operating condition until all disturbed soils are permanently stabilized. To ensure this, the following areas will be inspected by the Contractor every week and after every rainfall event of 0.5 inches or greater:

The following standard maintenance practices will apply to the erosion and sedimentation controls for the project:



- All erosion and sediment control measures will be properly maintained. If repairs or other maintenance is necessary, it will be initiated by the Contractor within 24 hours of report;
- Straw Wattles will be inspected for depth of sediment, tears, to see if the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in the ground;
- Built up sediment will be removed from straw wattles when it has reached one-half the height of the fence and at end of the job;
- Erosion control measures will be maintained for disturbed areas of the site that have not been stabilized;
- Erosion control measures will be installed and maintained for the construction staging area, stockpiles, and material storage areas until those areas have been stabilized after construction; and,
- Temporary and permanent seeding and planting will be inspected for bare spots, washouts, and healthy growth.

If the inspections reveal the need for additional control devices to prevent erosion and sedimentation, the Contractor will promptly install additional protection devices as required. Control devices in need of repair will be repaired promptly after identification. A stockpile of 100 linear feet of straw wattles will be maintained on the site and under cover for emergency repairs and routine maintenance.

The Owner (or their representative) will be responsible for preparing an inspection and maintenance report following each inspection and filing completed reports after maintenance action has taken place by the Contractor. The Contractor's superintendent will be responsible for maintenance and repair activities and completing and signing the maintenance action portion of inspection and maintenance reports.

4.9 STANDARD 9: OPERATION AND MAINTENANCE PLAN

A Long-Term Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed.

Standard Met:

An Operation & Maintenance Plan is referenced as Appendix D and is provided under separate cover.

4.10 STANDARD 10: PROHIBITION OF ILLICIT DISCHARGES

All illicit discharges to the stormwater management system are prohibited.

<u>No change</u>

<u>Illicit Discharge Statement</u> The project's stormwater management system, as shown on the plans submitted with this report, have been designed in full compliance with Standard 10. The project area does not have any known illicit connections.



Attachments:	Appendix A – Stormwater Checklist
	Appendix B – Drainage Figures
	Appendix C – HydroCAD Analysis
	C.1 – Existing Conditions
	C.2 – Proposed Conditions
	Appendix D – Stormwater Operation and Maintenance Plan
	Appendix E – Water Quality Calculation
	Appendix F – Project Data: NOAA Rainfall and NRCS Web Soil Survey
	Appendix G – Boring Log



Appendix A Stormwater Checklist Stormwater Checklist



Massachusetts Department of Environmental Protection Bureau of Resource Protection - Wetlands Program Checklist for Stormwater Report

A. Introduction

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



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

¹ The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

² For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Longterm Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



2/

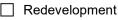
1/15/2024

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

Signature and Date

New development



Mix of New Development and Redevelopment



Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

	No disturbance to any Wetland Resource Areas
	Site Design Practices (e.g. clustered development, reduced frontage setbacks)
	Reduced Impervious Area (Redevelopment Only)
\boxtimes	Minimizing disturbance to existing trees and shrubs
	LID Site Design Credit Requested:
	Credit 1
	Credit 2
	Credit 3
	Use of "country drainage" versus curb and gutter conveyance and pipe
	Bioretention Cells (includes Rain Gardens)
	Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
	Treebox Filter
	Water Quality Swale
	Grass Channel
	Green Roof
\square	Other (describe):

Standard 1: No New Untreated Discharges

- \boxtimes No new untreated discharges
- Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



Standard 2: Peak Rate Attenuation

- Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

Calculations provided to show that post-development peak discharge rates do not exceed predevelopment rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24hour storm.

Standard 3: Recharge

Soil Analysis pro	vided.
-------------------	--------

- Required Recharge Volume calculation provided.
- Required Recharge volume reduced through use of the LID site Design Credits.
- Sizing the infiltration, BMPs is based on the following method: Check the method used.

Static	🛛 Simple Dynamic
--------	------------------

Dynamic Field¹

- Runoff from all impervious areas at the site discharging to the infiltration BMP.
- Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

\boxtimes	Recharge BMPs	have been sized	to infiltrate the	Required	Recharge V	olume.
-------------	---------------	-----------------	-------------------	----------	------------	--------

- Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - Site is comprised solely of C and D soils and/or bedrock at the land surface
 - M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - Solid Waste Landfill pursuant to 310 CMR 19.000
 - Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- \boxtimes Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

¹ 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



Standard 3: Recharge (continued)

The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
- ☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - is within the Zone II or Interim Wellhead Protection Area
 - is near or to other critical areas
 - is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - involves runoff from land uses with higher potential pollutant loads.
- The Required Water Quality Volume is reduced through use of the LID site Design Credits.
- Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Standard 4: Water Quality (continued)					
\boxtimes The BMP is sized (and calculations provided) based on:					
The $\frac{1}{2}$ " or 1" Water Quality Volume or					
The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.					
☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.					
A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.					
Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)					
The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.					
The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted prior to the discharge of stormwater to the post-construction stormwater BMPs.					
The NPDES Multi-Sector General Permit does <i>not</i> cover the land use.					
□ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.					
All exposure has been eliminated.					
All exposure has <i>not</i> been eliminated and all BMPs selected are on MassDEP LUHPPL list.					
☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.					
Standard 6: Critical Areas					
The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.					

Critical areas and BMPs are identified in the Stormwater Report.



Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

Limited Proje	ect
---------------	-----

- Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- Bike Path and/or Foot Path
- Redevelopment Project
- Redevelopment portion of mix of new and redevelopment.
- Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- ☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has *not* been included in the Stormwater Report but will be submitted *before* land disturbance begins.
- The project is *not* covered by a NPDES Construction General Permit.
- The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

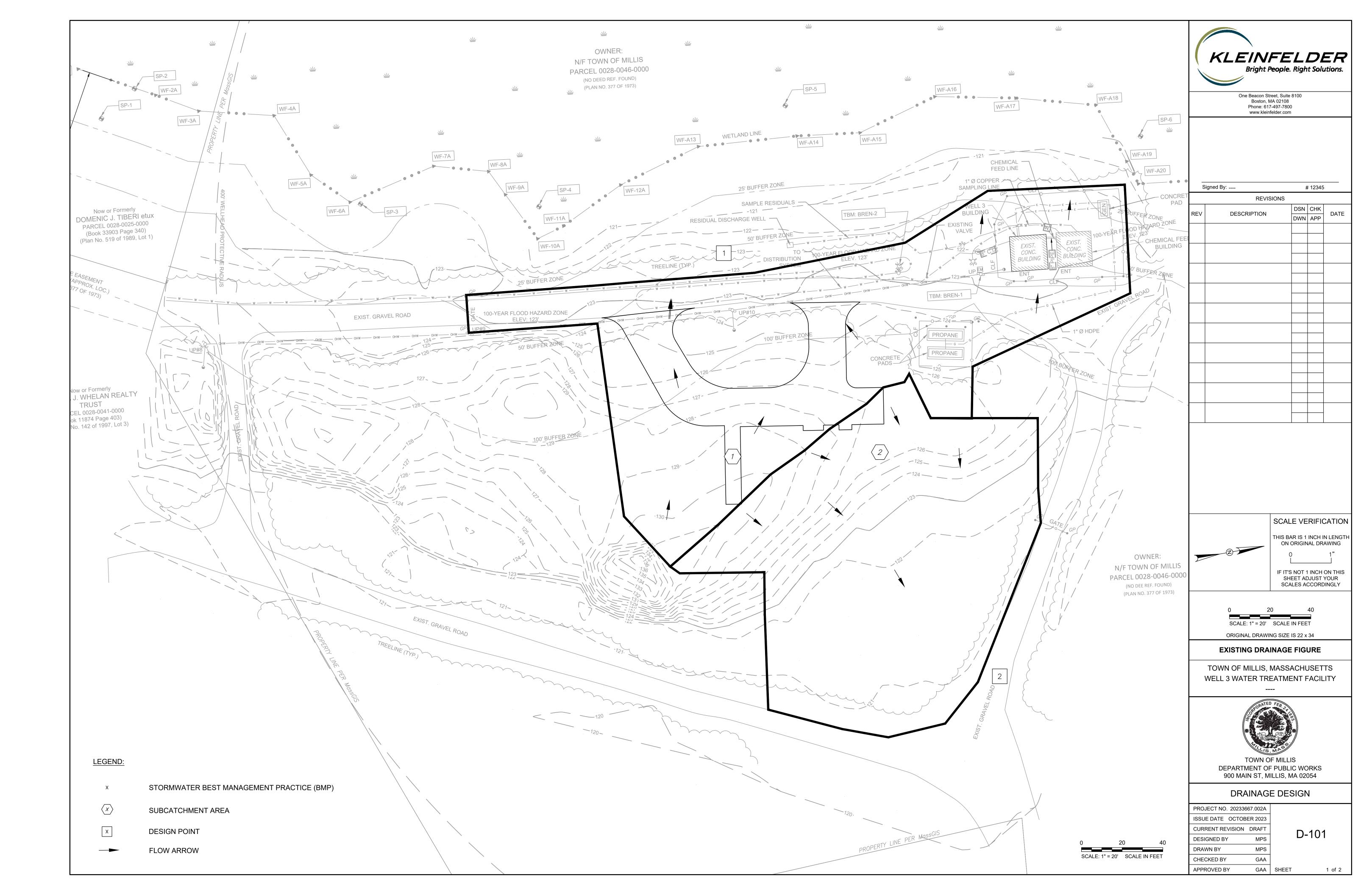
- The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - Name of the stormwater management system owners;
 - Party responsible for operation and maintenance;
 - Schedule for implementation of routine and non-routine maintenance tasks;
 - Plan showing the location of all stormwater BMPs maintenance access areas;
 - Description and delineation of public safety features;
 - Estimated operation and maintenance budget; and
 - Operation and Maintenance Log Form.
- The responsible party is *not* the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

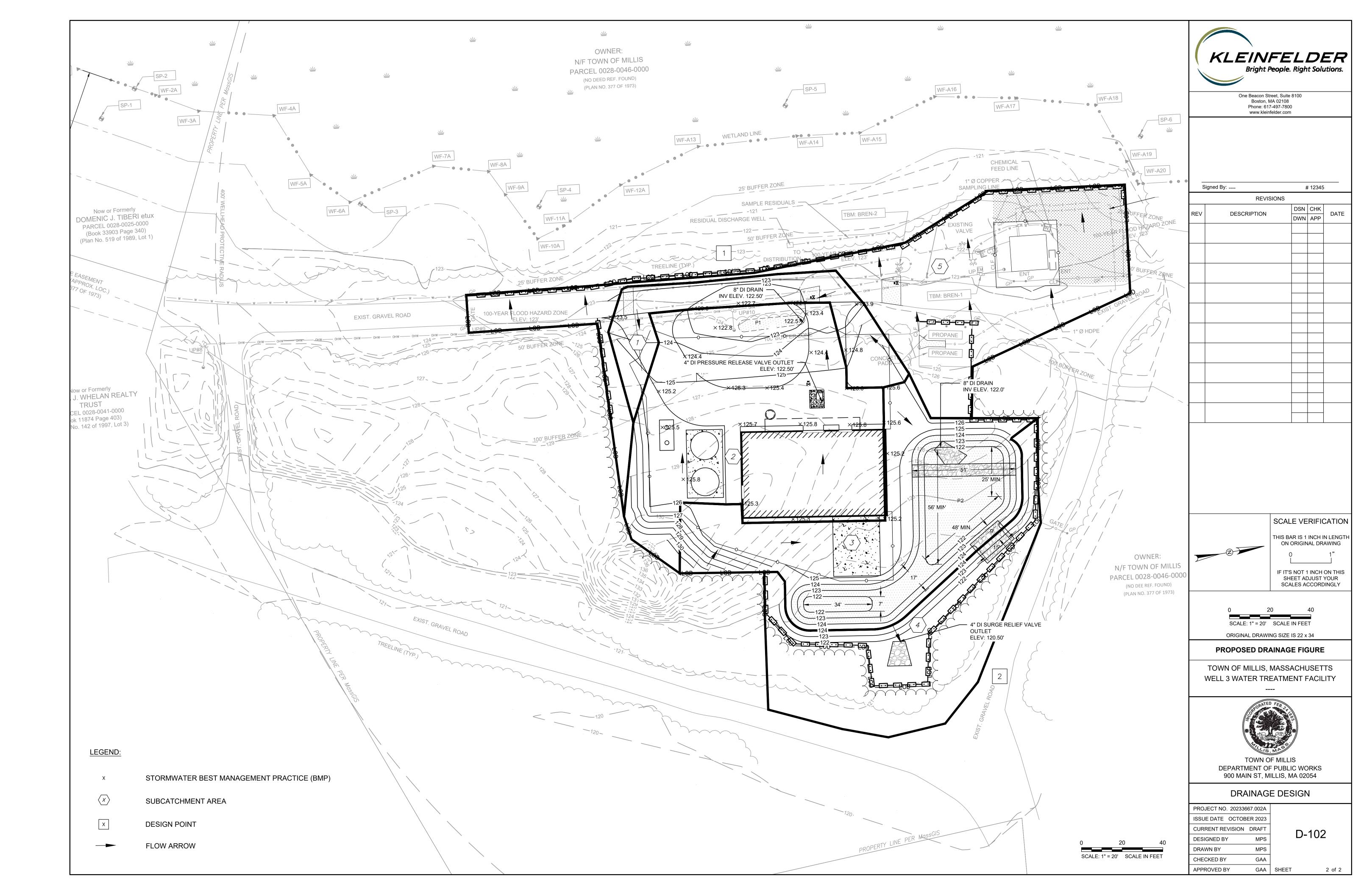
Standard 10: Prohibition of Illicit Discharges

- The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- An Illicit Discharge Compliance Statement is attached;
- NO Illicit Discharge Compliance Statement is attached but will be submitted *prior to* the discharge of any stormwater to post-construction BMPs.



Appendix B Drainage Figures



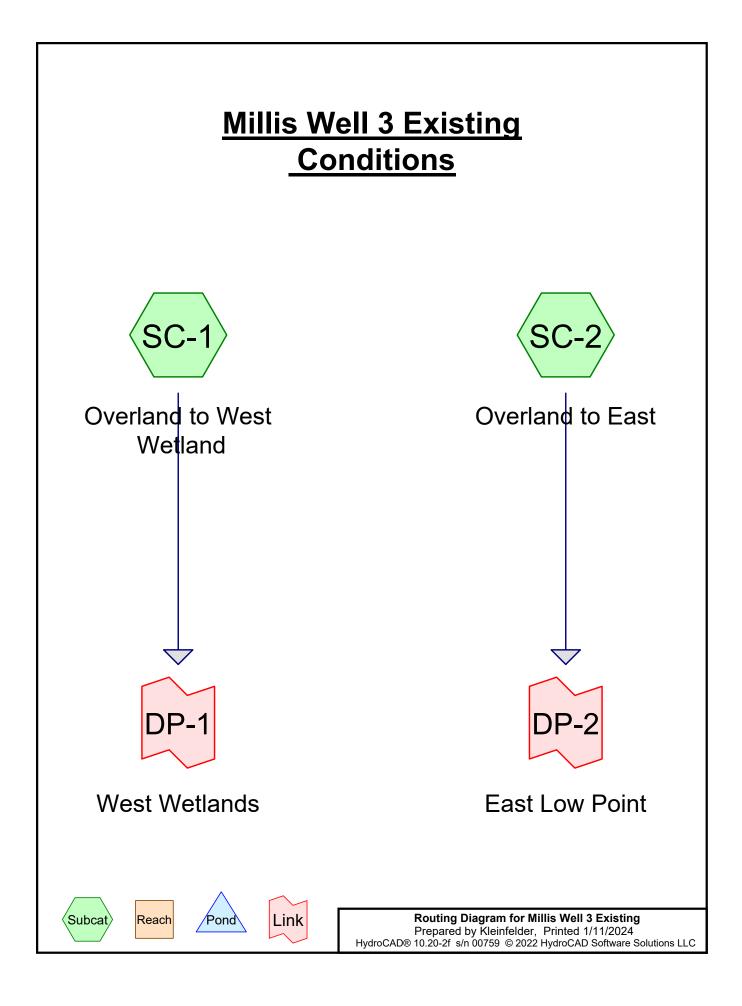




Appendix C HydroCAD Analysis



Appendix C.1 Existing Conditions



Millis Well 3 Existing

Prepared by Kleinfelder	
HydroCAD® 10.20-2f s/n 00759	© 2022 HydroCAD Software Solutions LLC

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year	Type III 24-hr		Default	24.00	1	2.76	2
2	2-Year	Type III 24-hr		Default	24.00	1	3.39	2
3	5-Year	Type III 24-hr		Default	24.00	1	4.42	2
4	10-Year	Type III 24-hr		Default	24.00	1	5.28	2
5	25-Year	Type III 24-hr		Default	24.00	1	6.45	2
6	100-Year	Type III 24-hr		Default	24.00	1	8.27	2

Rainfall Events Listing

Area Listing (all nodes)

Area	CN	Description	
(acres)		(subcatchment-numbers)	
0.226	96	Gravel surface, HSG A (SC-1)	
0.021	98	Impervious, HSG A (SC-1)	
0.766	30	Woods, Good, HSG A (SC-1, SC-2)	
1.013	46	TOTAL AREA	

Millis Well 3 Existing Prepared by Kleinfelder	Type III 24-hr 1-Year Rainfall=2.76" Printed 1/11/2024
HydroCAD® 10.20-2f s/n 00759 © 2022 HydroC	
· · · · · · · · · · · · · · · · · · ·	72.00 hrs, dt=0.05 hrs, 1441 points
	-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind	method - Pond routing by Dyn-Stor-Ind method
SubcatchmentSC-1: Overland to West	Runoff Area=24,786 sf 3.61% Impervious Runoff Depth=1.01"
	Tc=6.0 min CN=WQ Runoff=0.62 cfs 0.048 af
SubcatchmentSC-2: Overland to East	Runoff Area=19,349 sf 0.00% Impervious Runoff Depth=0.00"
	Tc=6.0 min CN=30 Runoff=0.00 cfs 0.000 af
Link DP-1: West Wetlands	Inflow=0.62 cfs_0.048 af
	Primary=0.62 cfs 0.048 af
Link DP-2: East Low Point	Inflow=0.00 cfs_0.000 af
	Primary=0.00 cfs 0.000 af
Total Runoff Area = 1.013 a	ac Runoff Volume = 0.048 af Average Runoff Depth = 0.57"

Total Runoff Area = 1.013 acRunoff Volume = 0.048 afAverage Runoff Depth = 0.57"97.97% Pervious = 0.993 ac2.03% Impervious = 0.021 ac

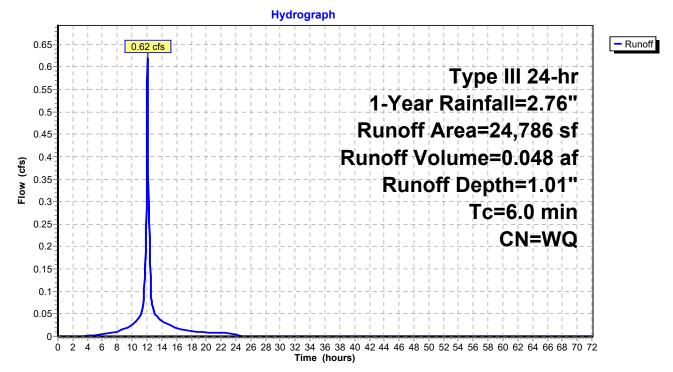
Summary for Subcatchment SC-1: Overland to West Wetland

Runoff = 0.62 cfs @ 12.09 hrs, Volume= Routed to Link DP-1 : West Wetlands 0.048 af, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 1-Year Rainfall=2.76"

/	Area (sf)	CN	Description		
	14,031	30	Woods, Go	od, HSG A	
	9,861	96	Gravel surfa	ace, HSG A	Ą
*	894	98	Impervious	, HSG A	
	24,786		Weighted A	verage	
	23,892	57	96.39% Pe	rvious Area	1
	894	98	3.61% Impe	ervious Are	а
Тс	Length	Slop	e Velocity	Capacity	Description
(min)	(feet)	(ft/f	t) (ft/sec)	(cfs)	
6.0					Direct Entry, Tc Min

Subcatchment SC-1: Overland to West Wetland

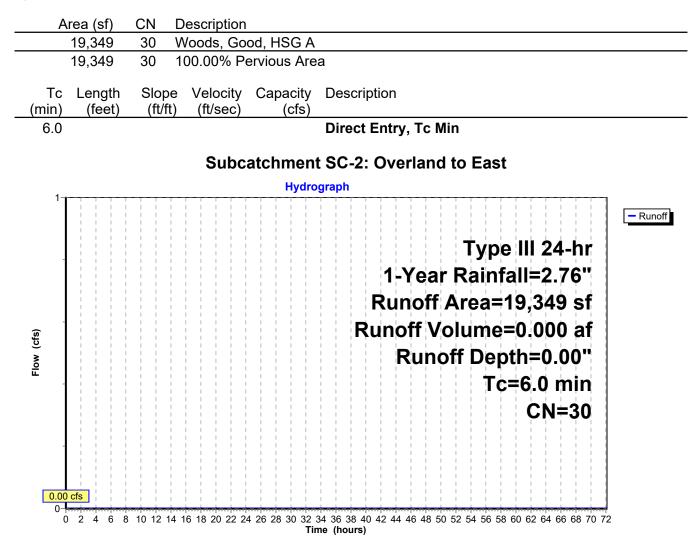


Summary for Subcatchment SC-2: Overland to East

Runoff = 0.00 cfs @ 0.00 hrs, Volume= Routed to Link DP-2 : East Low Point

0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 1-Year Rainfall=2.76"

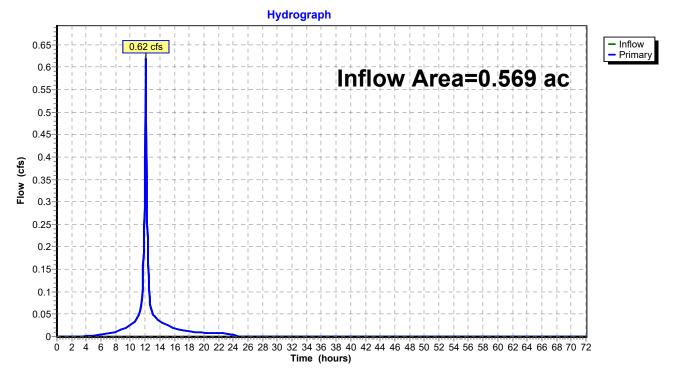


Summary for Link DP-1: West Wetlands

Inflow Area =	0.569 ac,	3.61% Impervious, Inflow E	Depth = 1.01"	for 1-Year event
Inflow =	0.62 cfs @	12.09 hrs, Volume=	0.048 af	
Primary =	0.62 cfs @	12.09 hrs, Volume=	0.048 af, Atte	en= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: West Wetlands

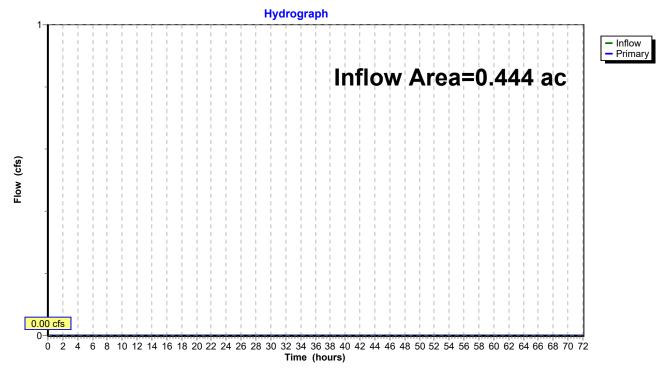


Summary for Link DP-2: East Low Point

Inflow Area	=	0.444 ac,	0.00% Impervious, Infl	ow Depth = $0.00"$	for 1-Year event
Inflow =	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af	
Primary =	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af, Atte	en= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: East Low Point



Millis Well 3 Existing Prepared by Kleinfelder	Type III 24-hr 2-Year Rainfall=3.39" Printed 1/11/2024
HydroCAD® 10.20-2f s/n 00759 © 2022 HydroC	
<u>·····································</u>	
· · · · · · · · · · · · · · · · · · ·	72.00 hrs, dt=0.05 hrs, 1441 points
	-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind	method - Pond routing by Dyn-Stor-Ind method
SubcatchmentSC-1: Overland to West	Runoff Area=24,786 sf 3.61% Impervious Runoff Depth=1.28"
	Tc=6.0 min CN=WQ Runoff=0.77 cfs 0.061 af
SubcatchmentSC-2: Overland to East	Runoff Area=19,349 sf 0.00% Impervious Runoff Depth=0.00"
	Tc=6.0 min CN=30 Runoff=0.00 cfs 0.000 af
Link DP-1: West Wetlands	Inflow=0.77 cfs_0.061 af
	Primary=0.77 cfs 0.061 af
Link DP-2: East Low Point	Inflow=0.00 cfs 0.000 af
	Primary=0.00 cfs 0.000 af
Total Rupoff Area = 1.012	a Bunoff Volume = 0.061 of Average Bunoff Donth = 0.72"
Total Runoff Area = 1.013 a	ac Runoff Volume = 0.061 af Average Runoff Depth = 0.72"

Total Runoff Area = 1.013 acRunoff Volume = 0.061 afAverage Runoff Depth = 0.72"97.97% Pervious = 0.993 ac2.03% Impervious = 0.021 ac

0.061 af, Depth= 1.28"

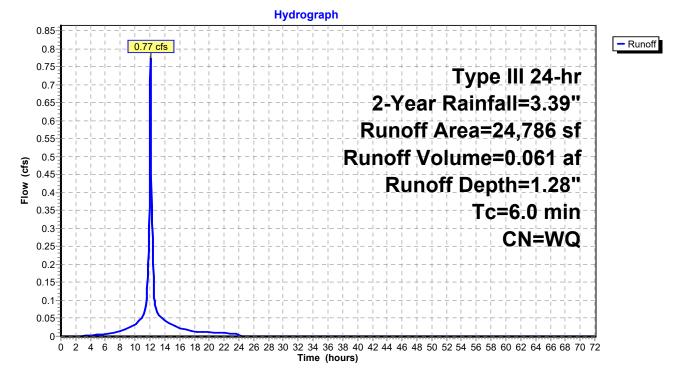
Summary for Subcatchment SC-1: Overland to West Wetland

Runoff 0.77 cfs @ 12.09 hrs, Volume= = Routed to Link DP-1 : West Wetlands

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 2-Year Rainfall=3.39"

A	Area (sf)	CN	Description		
	14,031	30	Woods, Go	od, HSG A	
	9,861	96	Gravel surfa	ace, HSG A	Α
*	894	98	Impervious	, HSG A	
	24,786		Weighted A	verage	
	23,892	57	96.39% Pe	rvious Area	1
	894	98	3.61% Impe	ervious Area	a
Тс	Length	Slop	e Velocity	Capacity	Description
(min)	(feet)	(ft/f	t) (ft/sec)	(cfs)	
6.0					Direct Entry, Tc Min

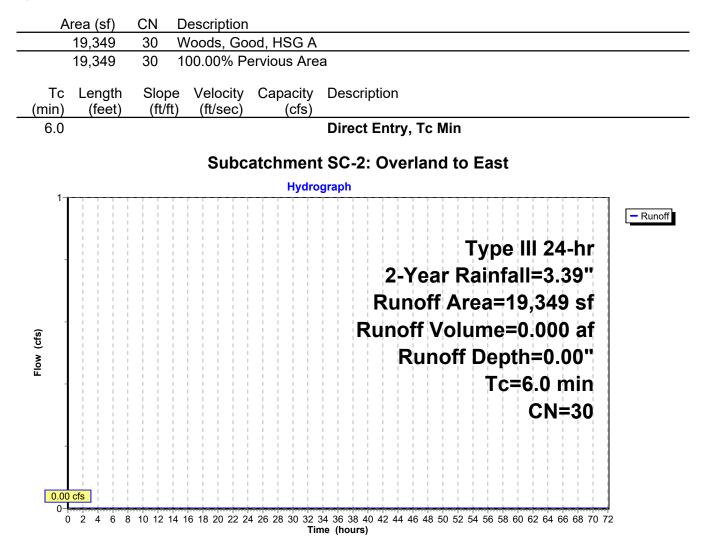
Subcatchment SC-1: Overland to West Wetland



Summary for Subcatchment SC-2: Overland to East

Runoff = 0.00 cfs @ 0.00 hrs, Volume= Routed to Link DP-2 : East Low Point 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 2-Year Rainfall=3.39"

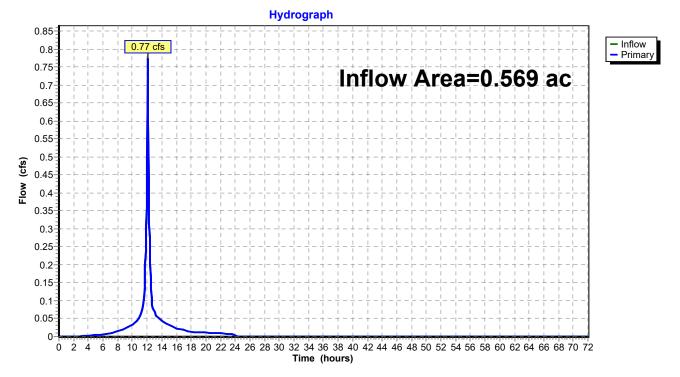


Summary for Link DP-1: West Wetlands

Inflow Area =	0.569 ac,	3.61% Impervious, Inflow	Depth = 1.28"	for 2-Year event
Inflow =	0.77 cfs @	12.09 hrs, Volume=	0.061 af	
Primary =	0.77 cfs @	12.09 hrs, Volume=	0.061 af, Atte	en= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: West Wetlands

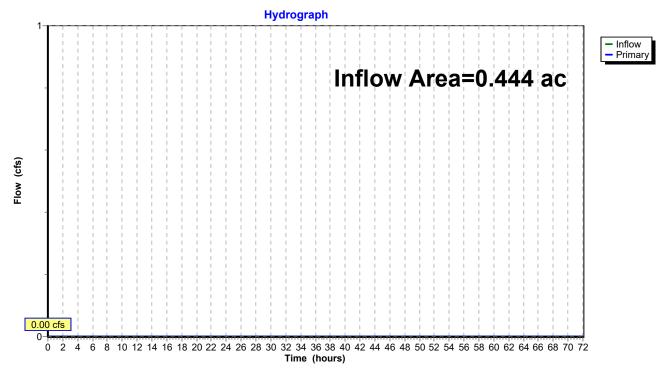


Summary for Link DP-2: East Low Point

Inflow Area	=	0.444 ac,	0.00% Impervious, Ir	nflow Depth = 0.00"	for 2-Year event
Inflow =	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af	
Primary =	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af, Att	en= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: East Low Point



Millis Well 3 Existing Prepared by Kleinfelder	Type III 24-hr 5-Year Rainfall=4.42" Printed 1/11/2024
HydroCAD® 10.20-2f s/n 00759 © 2022 HydroC	
Runoff by SCS TR	72.00 hrs, dt=0.05 hrs, 1441 points -20 method, UH=SCS, Weighted-Q method - Pond routing by Dyn-Stor-Ind method
SubcatchmentSC-1: Overland to West	Runoff Area=24,786 sf 3.61% Impervious Runoff Depth=1.73" Tc=6.0 min CN=WQ Runoff=1.02 cfs 0.082 af
SubcatchmentSC-2: Overland to East	Runoff Area=19,349 sf 0.00% Impervious Runoff Depth=0.00" Tc=6.0 min CN=30 Runoff=0.00 cfs 0.000 af
Link DP-1: West Wetlands	Inflow=1.02 cfs 0.082 af
	Primary=1.02 cfs 0.082 af
Link DP-2: East Low Point	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af
Total Runoff Area = 1.013 a	ac Runoff Volume = 0.082 af Average Runoff Depth = 0.97"

Total Runoff Area = 1.013 acRunoff Volume = 0.082 afAverage Runoff Depth = 0.97"97.97% Pervious = 0.993 ac2.03% Impervious = 0.021 ac

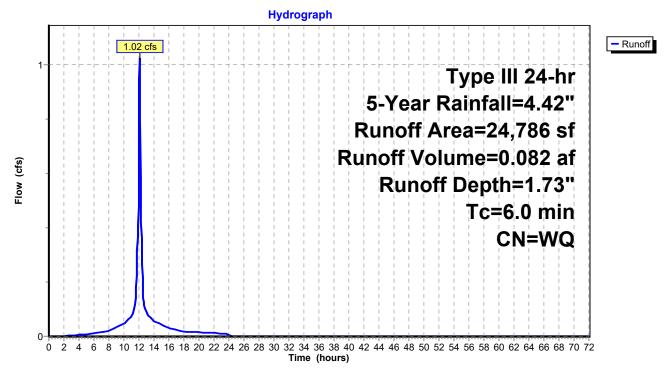
Summary for Subcatchment SC-1: Overland to West Wetland

Runoff = 1.02 cfs @ 12.09 hrs, Volume= Routed to Link DP-1 : West Wetlands 0.082 af, Depth= 1.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 5-Year Rainfall=4.42"

	Area (sf)	CN	Description			
	14,031	30	Woods, Go	od, HSG A		
	9,861	96	Gravel surfa	ace, HSG A	A	
*	894	98	Impervious	, HSG A		
	24,786		Weighted A	verage		
	23,892	57	96.39% Pervious Area			
	894	98	3.61% Impervious Area			
T (miı)	c Length n) (feet)	Slop (ft/1	,	Capacity (cfs)	Description	
6	0				Direct Entry, Tc Min	

Subcatchment SC-1: Overland to West Wetland



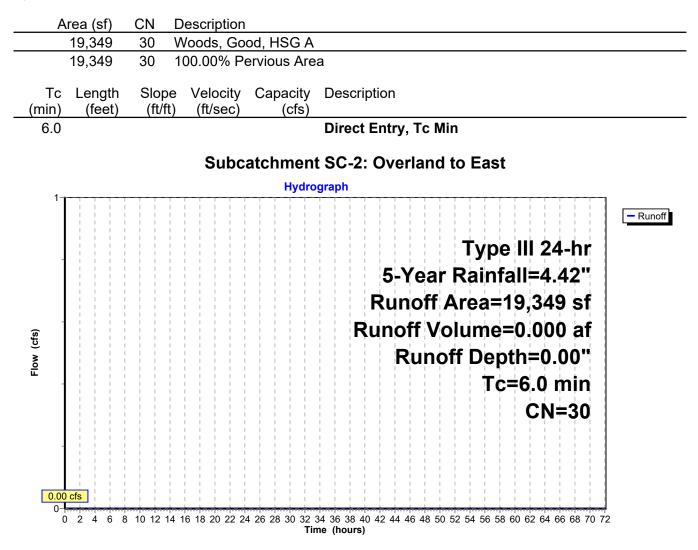
Summary for Subcatchment SC-2: Overland to East

Runoff 0.00 cfs @ 0.00 hrs, Volume= = Routed to Link DP-2 : East Low Point

0.000 af, Depth= 0.00"

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Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 5-Year Rainfall=4.42"

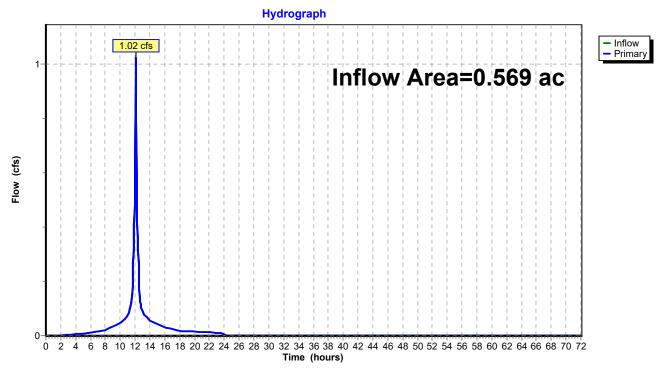


Summary for Link DP-1: West Wetlands

Inflow Area =	0.569 ac,	3.61% Impervious, Inflow E	Depth = 1.73"	for 5-Year event
Inflow =	1.02 cfs @	12.09 hrs, Volume=	0.082 af	
Primary =	1.02 cfs @	12.09 hrs, Volume=	0.082 af, Atte	en= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: West Wetlands

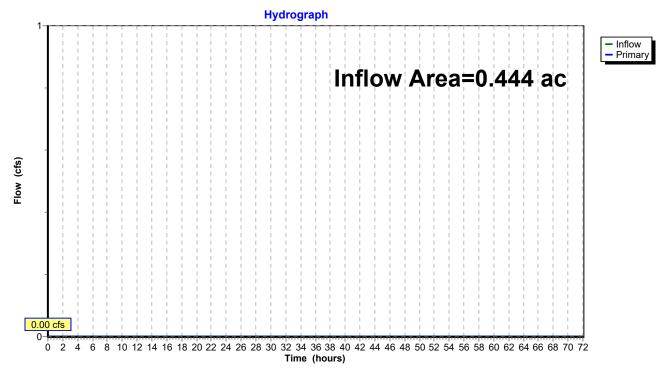


Summary for Link DP-2: East Low Point

Inflow Area	=	0.444 ac,	0.00% Impervious, Inflo	w Depth = 0.00"	for 5-Year event
Inflow =	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af	
Primary =	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af, Atte	en= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: East Low Point



Millis Well 3 Existing Prepared by Kleinfelder	Type III 24-hr 10-Year Rainfall=5.28" Printed 1/11/2024				
HydroCAD® 10.20-2f s/n 00759 © 2022 Hydro	CAD Software Solutions LLC Page 19				
Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points Runoff by SCS TR-20 method, UH=SCS, Weighted-Q Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method					
SubcatchmentSC-1: Overland to West	Runoff Area=24,786 sf 3.61% Impervious Runoff Depth=2.10" Tc=6.0 min CN=WQ Runoff=1.23 cfs 0.100 af				
SubcatchmentSC-2: Overland to East	Runoff Area=19,349 sf 0.00% Impervious Runoff Depth=0.02" Tc=6.0 min CN=30 Runoff=0.00 cfs 0.001 af				
Link DP-1: West Wetlands	Inflow=1.23 cfs 0.100 af Primary=1.23 cfs 0.100 af				
Link DP-2: East Low Point	Inflow=0.00 cfs 0.001 af Primary=0.00 cfs 0.001 af				
Total Runoff Area = 1.013	ac Runoff Volume = 0.100 af Average Runoff Depth = 1.19" 97.97% Pervious = 0.993 ac 2.03% Impervious = 0.021 ac				

Runoff 1.23 cfs @ 12.09 hrs, Volume= = Routed to Link DP-1 : West Wetlands

0.100 af, Depth= 2.10"

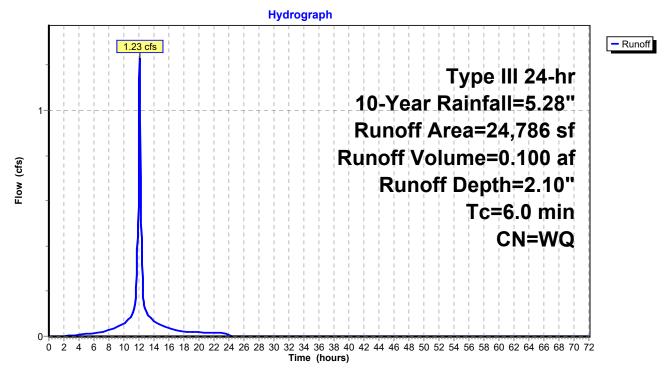
Printed 1/11/2024

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Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 10-Year Rainfall=5.28"

	Area (sf)	CN	Description			
	14,031	30	Woods, Go	od, HSG A		
	9,861	96	Gravel surfa	ace, HSG A	4	
*	894	98	Impervious	, HSG A		
	24,786		Weighted A	verage		
	23,892	57	96.39% Pe	rvious Area	l	
	894	98	3.61% Impervious Area			
T (mir	c Length n) (feet)	Slop (ft/f		Capacity (cfs)	Description	
6.	0				Direct Entry, Tc Min	

Subcatchment SC-1: Overland to West Wetland



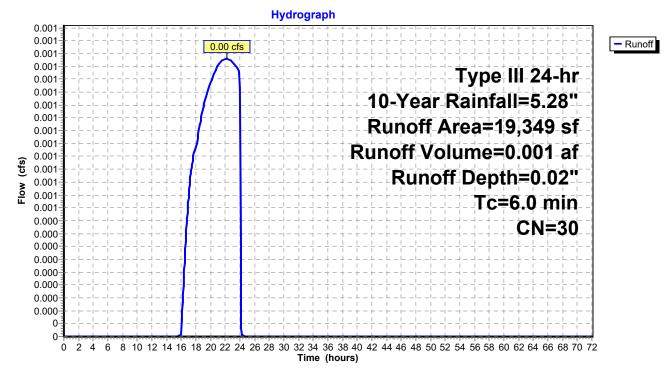
Summary for Subcatchment SC-2: Overland to East

Runoff = 0.00 cfs @ 22.19 hrs, Volume= Routed to Link DP-2 : East Low Point 0.001 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 10-Year Rainfall=5.28"

A	rea (sf)	CN I	Description				
	19,349	30	Woods, Good, HSG A				
	19,349	30	100.00% Pe	ervious Are	a		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description		
6.0					Direct Entry, Tc Min		

Subcatchment SC-2: Overland to East

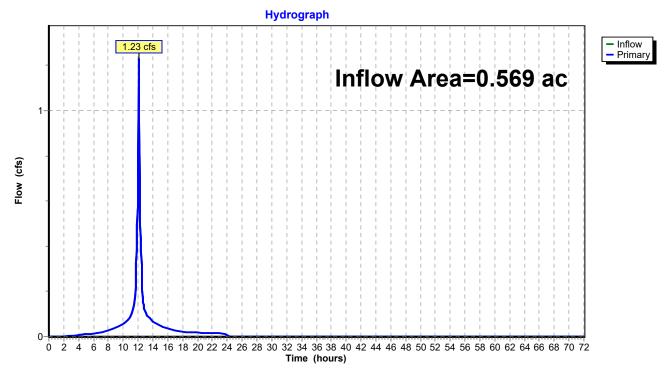


Summary for Link DP-1: West Wetlands

Inflow Area =	0.569 ac,	3.61% Impervious, Inflow I	Depth = 2.10"	for 10-Year event
Inflow =	1.23 cfs @	12.09 hrs, Volume=	0.100 af	
Primary =	1.23 cfs @	12.09 hrs, Volume=	0.100 af, Atte	en= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: West Wetlands

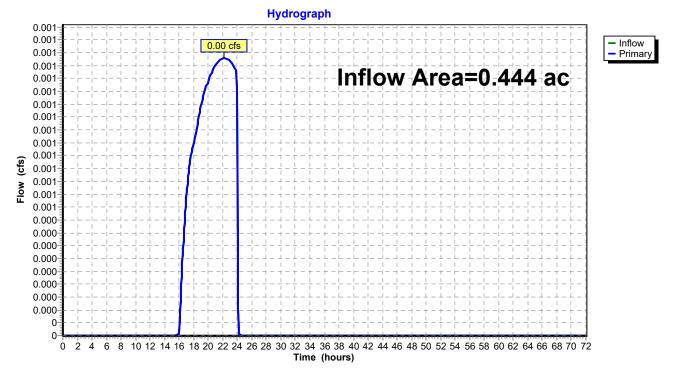


Summary for Link DP-2: East Low Point

Inflow Area	=	0.444 ac,	0.00% Impervious, Ir	nflow Depth = 0.02"	for 10-Year event
Inflow =	=	0.00 cfs @	22.19 hrs, Volume=	0.001 af	
Primary =	=	0.00 cfs @	22.19 hrs, Volume=	0.001 af, Atte	en= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: East Low Point



Millis Well 3 Existing Prepared by Kleinfelder	Type III 24-hr 25-Year Rainfall=6.45" Printed 1/11/2024
HydroCAD® 10.20-2f s/n 00759 © 2022 HydroC	CAD Software Solutions LLC Page 24
Runoff by SCS TR	72.00 hrs, dt=0.05 hrs, 1441 points -20 method, UH=SCS, Weighted-Q method - Pond routing by Dyn-Stor-Ind method
SubcatchmentSC-1: Overland to West	Runoff Area=24,786 sf 3.61% Impervious Runoff Depth=2.67" Tc=6.0 min CN=WQ Runoff=1.51 cfs 0.127 af
SubcatchmentSC-2: Overland to East	Runoff Area=19,349 sf 0.00% Impervious Runoff Depth=0.13" Tc=6.0 min CN=30 Runoff=0.01 cfs 0.005 af
Link DP-1: West Wetlands	Inflow=1.51 cfs_0.127 af
	Primary=1.51 cfs 0.127 af
Link DP-2: East Low Point	Inflow=0.01 cfs 0.005 af
	Primary=0.01 cfs 0.005 af
Total Runoff Area = 1.013 a	ac Runoff Volume = 0.131 af Average Runoff Depth = 1.56"

97.97% Pervious = 0.993 ac 2.03% Impervious = 0.021 ac

Summary for Subcatchment SC-1: Overland to West Wetland

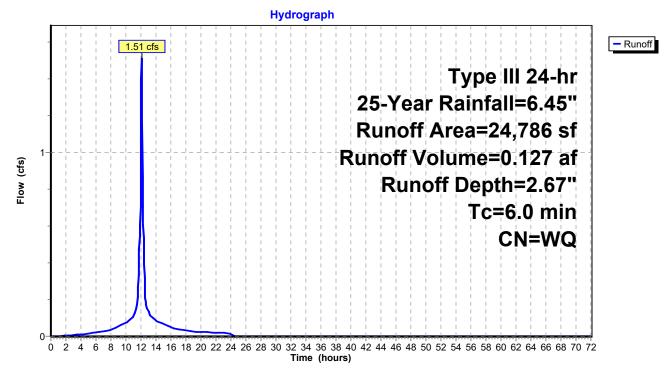
1.51 cfs @ 12.09 hrs, Volume= Runoff = Routed to Link DP-1 : West Wetlands

0.127 af, Depth= 2.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 25-Year Rainfall=6.45"

A	vrea (sf)	CN	Description		
	14,031	30	Woods, Go	od, HSG A	
	9,861	96	Gravel surfa	ace, HSG A	A
*	894	98	Impervious,	HSG A	
	24,786		Weighted A	verage	
	23,892	57	96.39% Per	vious Area	
	894	98	3.61% Impe	ervious Area	а
Tc (min)	Length (feet)	Slop (ft/f		Capacity (cfs)	Description
6.0					Direct Entry, Tc Min

Subcatchment SC-1: Overland to West Wetland



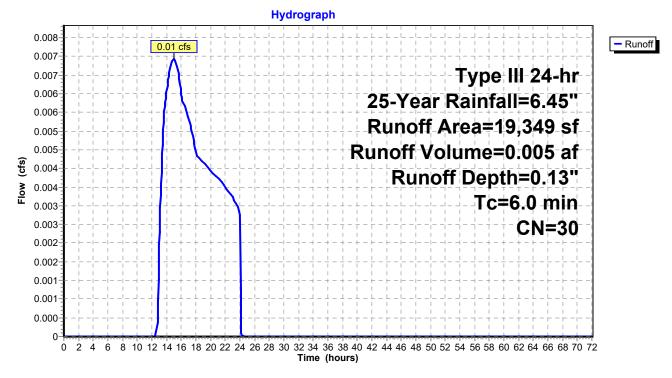
Summary for Subcatchment SC-2: Overland to East

Runoff = 0.01 cfs @ 14.96 hrs, Volume= Routed to Link DP-2 : East Low Point 0.005 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 25-Year Rainfall=6.45"

Ar	ea (sf)	CN [Description		
	19,349	30 \	Voods, Go	od, HSG A	
	19,349	30 ´	100.00% Pe	ervious Are	a
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Tc Min

Subcatchment SC-2: Overland to East

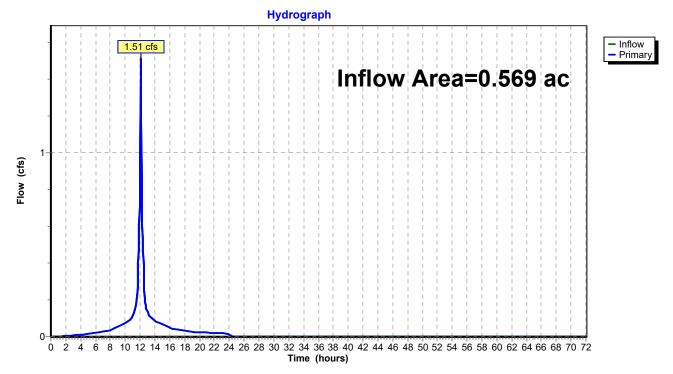


Summary for Link DP-1: West Wetlands

Inflow Area =	0.569 ac,	3.61% Impervious, Inflow [Depth = 2.67"	for 25-Year event
Inflow =	1.51 cfs @	12.09 hrs, Volume=	0.127 af	
Primary =	1.51 cfs @	12.09 hrs, Volume=	0.127 af, Atte	en= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: West Wetlands



Summary for Link DP-2: East Low Point

Inflow Area =	0.444 ac,	0.00% Impervious,	Inflow Depth = 0.13"	for 25-Year event
Inflow =	0.01 cfs @	14.96 hrs, Volume=	= 0.005 af	
Primary =	0.01 cfs @	14.96 hrs, Volume=	= 0.005 af, Att	en= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Hydrograph 0.008 - Inflow 0.01 cfs 0.007 Primary Inflow Area=0.444 ac 0.007 0.006 0.006 0.005 0.005 (cfs) 0.004 Flow 0.004 0.003 0.003 0.002 0.002 0.001 0.001 0.000-0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 Ó Time (hours)

Link DP-2: East Low Point

Millis Well 3 Existing Prepared by Kleinfelder	<i>Type III 24-hr 100-Year Rainfall=8.27"</i> Printed 1/11/2024
HydroCAD® 10.20-2f s/n 00759 © 2022 Hydro	CAD Software Solutions LLC Page 29
Runoff by SCS TF	72.00 hrs, dt=0.05 hrs, 1441 points R-20 method, UH=SCS, Weighted-Q method - Pond routing by Dyn-Stor-Ind method
SubcatchmentSC-1: Overland to West	Runoff Area=24,786 sf 3.61% Impervious Runoff Depth=3.66" Tc=6.0 min CN=WQ Runoff=1.95 cfs 0.174 af
SubcatchmentSC-2: Overland to East	Runoff Area=19,349 sf 0.00% Impervious Runoff Depth=0.48" Tc=6.0 min CN=30 Runoff=0.07 cfs 0.018 af
Link DP-1: West Wetlands	Inflow=1.95 cfs 0.174 af Primary=1.95 cfs 0.174 af
Link DP-2: East Low Point	Inflow=0.07 cfs 0.018 af Primary=0.07 cfs 0.018 af
Total Runoff Area = 1.013	ac Runoff Volume = 0.191 af Average Runoff Depth = 2.27" 97.97% Pervious = 0.993 ac 2.03% Impervious = 0.021 ac

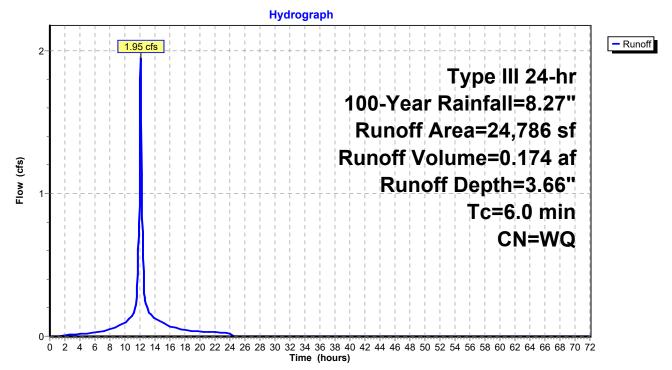
Summary for Subcatchment SC-1: Overland to West Wetland

Runoff = 1.95 cfs @ 12.09 hrs, Volume= Routed to Link DP-1 : West Wetlands 0.174 af, Depth= 3.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 100-Year Rainfall=8.27"

A	vrea (sf)	CN	Description		
	14,031	30	Woods, Go	od, HSG A	
	9,861	96	Gravel surfa	ace, HSG A	A
*	894	98	Impervious,	HSG A	
	24,786		Weighted A	verage	
	23,892	57	96.39% Per	vious Area	
	894	98	3.61% Impe	ervious Area	а
Tc (min)	Length (feet)	Slop (ft/f		Capacity (cfs)	Description
6.0					Direct Entry, Tc Min

Subcatchment SC-1: Overland to West Wetland



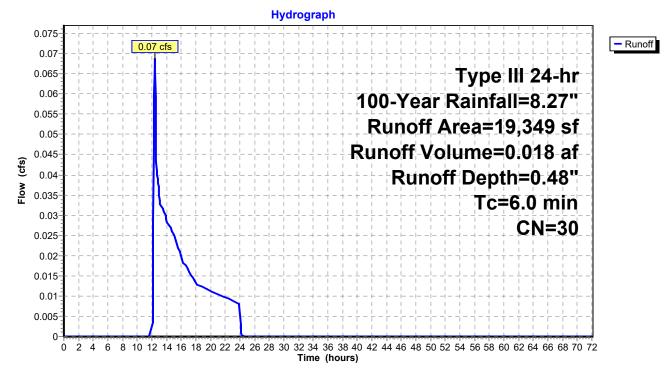
Summary for Subcatchment SC-2: Overland to East

Runoff = 0.07 cfs @ 12.40 hrs, Volume= Routed to Link DP-2 : East Low Point 0.018 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 100-Year Rainfall=8.27"

Area (sf) CN	Description		
19,349	9 30	Woods, Go	od, HSG A	
19,349	30	100.00% P	ervious Are	a
Tc Leng (min) (fee			Capacity (cfs)	Description
6.0				Direct Entry, Tc Min

Subcatchment SC-2: Overland to East

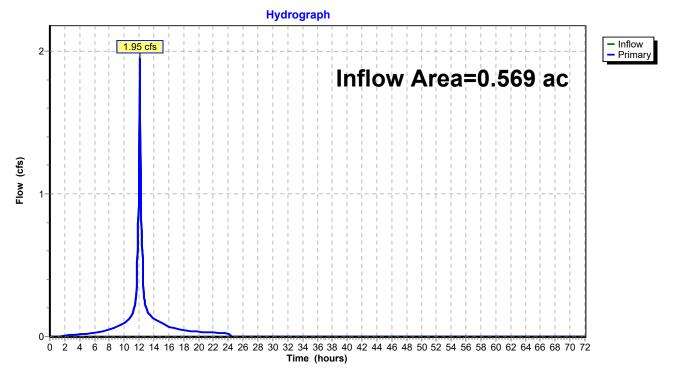


Summary for Link DP-1: West Wetlands

Inflow Area =	0.569 ac,	3.61% Impervious, Inflow E	Depth = 3.66"	for 100-Year event
Inflow =	1.95 cfs @	12.09 hrs, Volume=	0.174 af	
Primary =	1.95 cfs @	12.09 hrs, Volume=	0.174 af, Atte	en= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: West Wetlands



Summary for Link DP-2: East Low Point

Inflow Area	a =	0.444 ac,	0.00% Impervious, Inflow	Depth = 0.48"	for 100-Year event
Inflow	=	0.07 cfs @	12.40 hrs, Volume=	0.018 af	
Primary	=	0.07 cfs @	12.40 hrs, Volume=	0.018 af, Atte	en= 0%, Lag= 0.0 min

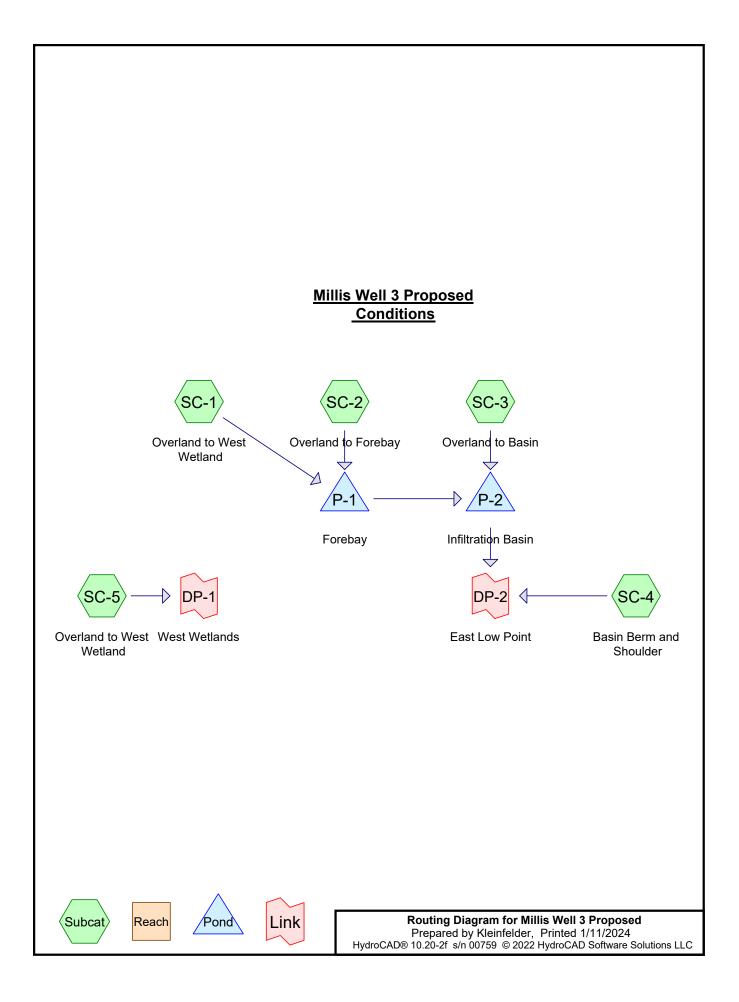
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Hydrograph 0.075 - + - + -- Inflow 0.07 cfs 0.07 - Primary Inflow Area=0.444 ac 0.065 0.06 0.055 0.05 0.045 Flow (cfs) 0.04 0.035 0.03 0.025 0.02 0.015 0.01 0.005 0-2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 Ó Time (hours)

Link DP-2: East Low Point



Appendix C.2 Proposed Conditions



Millis Well 3 Proposed

Prepared by Kleinfelder	
HydroCAD® 10.20-2f s/n 00759 © 2022 HydroCAD Software Solutions LLC	

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year	Type III 24-hr		Default	24.00	1	2.76	2
2	2-Year	Type III 24-hr		Default	24.00	1	3.39	2
3	5-Year	Type III 24-hr		Default	24.00	1	4.42	2
4	10-Year	Type III 24-hr		Default	24.00	1	5.28	2
5	25-Year	Type III 24-hr		Default	24.00	1	6.45	2
6	100-Year	Type III 24-hr		Default	24.00	1	8.27	2

Rainfall Events Listing

Area Listing (all nodes)

Area	CN	Description
(acres)		(subcatchment-numbers)
0.186	96	Gravel surface, HSG A (SC-1, SC-5)
0.012	98	Impervious, HSG A (SC-5)
0.404	39	Pasture/grassland/range, Good, HSG A (SC-1, SC-2, SC-3, SC-5)
0.183	98	Paved parking, HSG A (SC-1, SC-2)
0.055	98	Water Surface, 0% imp, HSG A (SC-3)
0.173	32	Woods/grass comb., Good, HSG A (SC-4)
1.013	63	TOTAL AREA

Millis Well 3 Proposed Prepared by Kleinfelder HydroCAD® 10.20-2f s/n 00759 © 2022 Hydro	<i>Type III 24-hr 1-Year Rainfall=2.76"</i> Printed 1/11/2024 CAD Software Solutions LLC Page 4
Runoff by SCS TF	-72.00 hrs, dt=0.05 hrs, 1441 points R-20 method, UH=SCS, Weighted-Q I method - Pond routing by Dyn-Stor-Ind method
SubcatchmentSC-1: Overland to West	Runoff Area=3,356 sf 15.85% Impervious Runoff Depth=1.48" Tc=6.0 min CN=WQ Runoff=0.12 cfs 0.010 af
SubcatchmentSC-2: Overland to Forebay	Runoff Area=11,864 sf 62.53% Impervious Runoff Depth=1.58" Tc=6.0 min CN=WQ Runoff=0.44 cfs 0.036 af
SubcatchmentSC-3: Overland to Basin	Runoff Area=9,595 sf 0.00% Impervious Runoff Depth=0.63" Tc=6.0 min CN=WQ Runoff=0.14 cfs 0.012 af
SubcatchmentSC-4: Basin Berm and	Runoff Area=7,531 sf 0.00% Impervious Runoff Depth=0.00" Tc=6.0 min CN=32 Runoff=0.00 cfs 0.000 af
SubcatchmentSC-5: Overland to West	Runoff Area=11,789 sf 4.58% Impervious Runoff Depth=1.40" Tc=6.0 min CN=WQ Runoff=0.41 cfs 0.032 af
Pond P-1: Forebay Discarded=0.02 cfs	Peak Elev=123.38' Storage=107 cf Inflow=0.57 cfs 0.045 af s 0.016 af Primary=0.49 cfs 0.029 af Outflow=0.51 cfs 0.045 af
Pond P-2: Infiltration Basin Discarded=0.12 cfs	Peak Elev=122.28' Storage=594 cf Inflow=0.62 cfs 0.041 af s 0.041 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.041 af
Link DP-1: West Wetlands	Inflow=0.41 cfs 0.032 af Primary=0.41 cfs 0.032 af
Link DP-2: East Low Point	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af

Total Runoff Area = 1.013 acRunoff Volume = 0.089 afAverage Runoff Depth = 1.05"80.76% Pervious = 0.818 ac19.24% Impervious = 0.195 ac

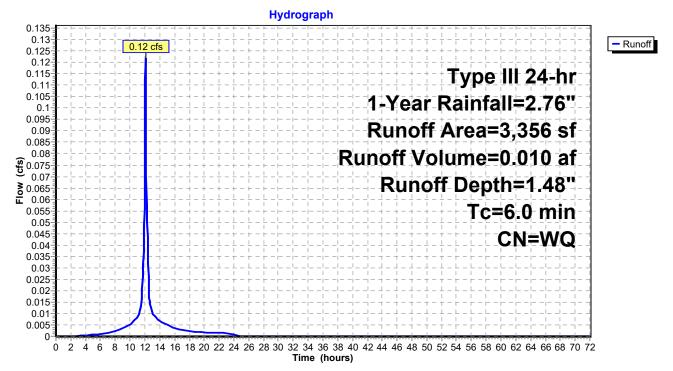
Summary for Subcatchment SC-1: Overland to West Wetland

Runoff = 0.12 cfs @ 12.09 hrs, Volume= Routed to Pond P-1 : Forebay 0.010 af, Depth= 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 1-Year Rainfall=2.76"

A	rea (sf)	CN	Description					
	532	98	Paved park	ing, HSG A	N			
	1,256	39	Pasture/gra	Pasture/grassland/range, Good, HSG A				
	1,568	96	Gravel surfa	ace, HSG A	4			
	3,356		Weighted A	Weighted Average				
	2,824	71	84.15% Per	84.15% Pervious Area				
	532	98	15.85% Impervious Area					
Та	Longth	Clan	o Volocity	Consoitu	Description			
Tc	Length	Slop		Capacity	Description			
(min)	(feet)	(ft/f	t) (ft/sec)	(cfs)				
6.0					Direct Entry, Tc Min			

Subcatchment SC-1: Overland to West Wetland



Summary for Subcatchment SC-2: Overland to Forebay

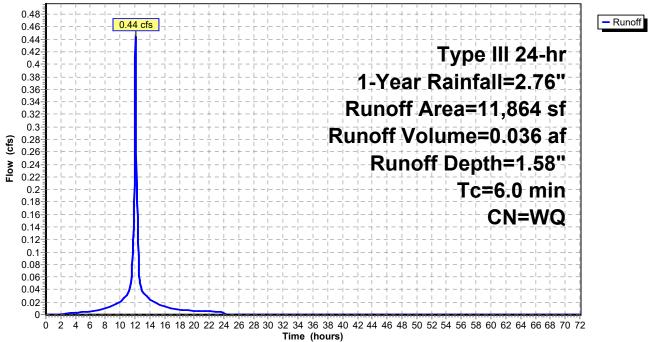
Runoff = 0.44 cfs @ 12.09 hrs, Volume= Routed to Pond P-1 : Forebay 0.036 af, Depth= 1.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 1-Year Rainfall=2.76"

Α	rea (sf)	CN	Description	Description				
	7,418	98	Paved park	ing, HSG A	N Contraction of the second			
	4,446	39	Pasture/gra	ssland/rang	ge, Good, HSG A			
	11,864		Weighted Average					
	4,446	39	37.47% Pe	37.47% Pervious Area				
	7,418	98	62.53% Impervious Area					
Tc (min)	Length (feet)	Slop (ft/f		Capacity (cfs)	Description			
6.0					Direct Entry, Tc Min			

Subcatchment SC-2: Overland to Forebay

Hydrograph



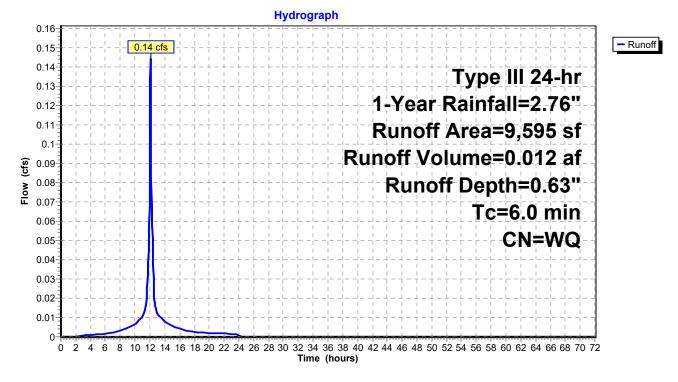
Summary for Subcatchment SC-3: Overland to Basin

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.012 af, Depth= 0.63" Routed to Pond P-2 : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 1-Year Rainfall=2.76"

A	rea (sf)	CN	Description						
	2,407	98	Water Surfa	Water Surface, 0% imp, HSG A					
	7,188	39	Pasture/gra	ssland/ran	ge, Good, HSG A				
	9,595		Weighted A	Weighted Average					
	9,595	54	100.00% P	100.00% Pervious Area					
_		~		• •					
Tc	Length	Slop	,	Capacity	Description				
(min)	(feet)	(ft/f	t) (ft/sec)	(cfs)					
6.0					Direct Entry, Tc Min				
					•				

Subcatchment SC-3: Overland to Basin



Summary for Subcatchment SC-4: Basin Berm and Shoulder

Runoff = 0.00 cfs @ 0.00 hrs, Volume= Routed to Link DP-2 : East Low Point 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 1-Year Rainfall=2.76"

A	Area (sf)	CN D	escription			
	7,531	32 V	/oods/gras	ss comb., G	Good, HSG A	
	7,531	32 1	00.00% Pe	ervious Are	a	
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description	
6.0					Direct Entry, Tc Min	
		S	ubcatch	ment SC	-4: Basin Berm and Shoulder	
1-	•			Hydro	ograph	
	D.cfs				Type III 24-hr 1-Year Rainfall=2.76" Runoff Area=7,531 sf Runoff Volume=0.000 af Runoff Depth=0.00" Tc=6.0 min CN=32	- Runoff
0-		10 12 14	6 18 20 22 24	1 26 28 30 32	34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72	
					me (hours)	

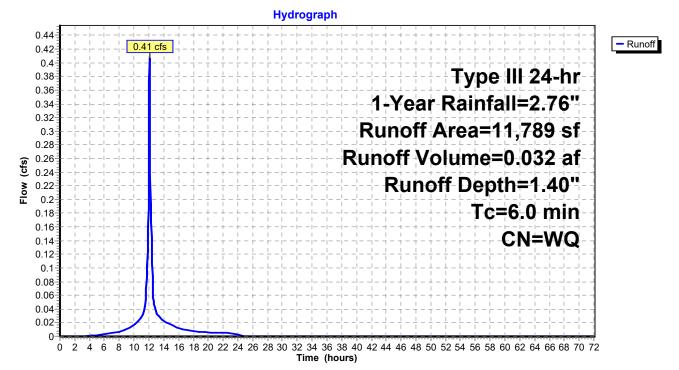
Summary for Subcatchment SC-5: Overland to West Wetland

Runoff = 0.41 cfs @ 12.09 hrs, Volume= Routed to Link DP-1 : West Wetlands 0.032 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 1-Year Rainfall=2.76"

	Area (sf)	CN	Description					
*	540	98	Impervious	, HSG A				
	4,724	39	Pasture/gra	ssland/rang	ge, Good, HSG A			
	6,525	96	Gravel surfa	ace, HSG A	Α			
	11,789		Weighted A	Weighted Average				
	11,249	72	95.42% Pe	rvious Area	ì			
	540	98	4.58% Impe	4.58% Impervious Area				
Т	c Length	Slop	e Velocity	Capacity	Description			
(mir) (feet)	(ft/f	t) (ft/sec)	(cfs)				
6.	0				Direct Entry, Tc Min			

Subcatchment SC-5: Overland to West Wetland

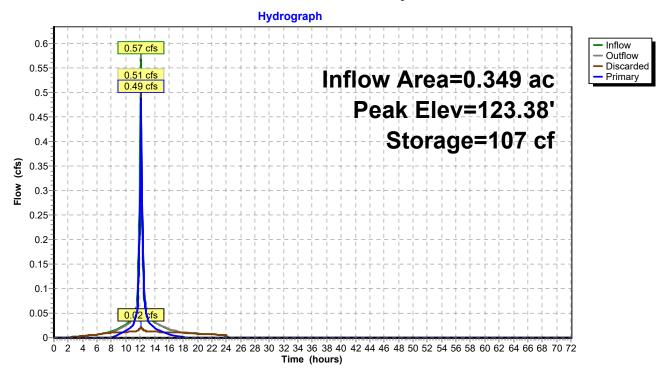


Summary for Pond P-1: Forebay

Inflow = 0.57 cfs @ Outflow = 0.51 cfs @ Discarded = 0.02 cfs @	52.23% Impervious, Inflow Depth = 1.56" for 1-Year event 12.09 hrs, Volume= 0.045 af 12.13 hrs, Volume= 0.045 af, Atten= 10%, Lag= 2.4 min 12.13 hrs, Volume= 0.016 af 12.13 hrs, Volume= 0.029 af tion Basin 0.029 af
	od, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs rs Surf.Area= 399 sf Storage= 107 cf
Center-of-Mass det. time= 5.1	
	Storage Description
#1 123.00'	472 cf Custom Stage Data (Prismatic)Listed below (Recalc)
Elevation Surf.Area	Inc.Store Cum.Store
(feet) (sq-ft)	(cubic-feet) (cubic-feet)
123.00 165	0 0
124.00 779	472 472
Device Routing Inv	ert Outlet Devices
#1 Primary 123.0 #2 Discarded 123.0	L= 69.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 123.00' / 122.50' S= 0.0072 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
Discarded OutFlow Max=0.0	cfs @ 12.13 hrs HW=123.38' (Free Discharge)

Discarded OutFlow Max=0.02 cfs @ 12.13 hrs HW=123.38' (Free Discharge) **2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.48 cfs @ 12.13 hrs HW=123.38' TW=122.15' (Dynamic Tailwater) ☐ 1=Culvert (Barrel Controls 0.48 cfs @ 2.62 fps) Pond P-1: Forebay

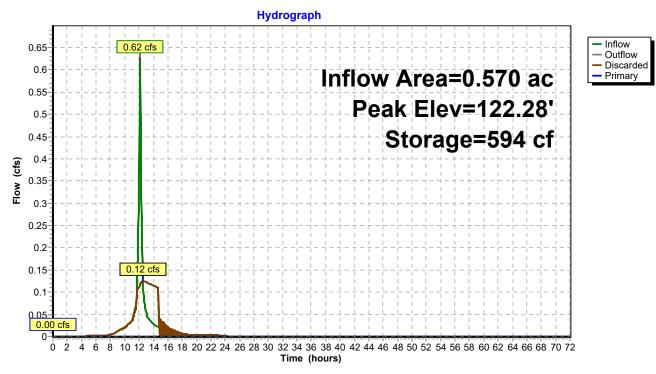


Summary for Pond P-2: Infiltration Basin

Inflow Outflow Discarde Primary	= 0.62 = 0.12 ed = 0.12	cfs @ 12 cfs @ 12 cfs @ 12 cfs @ 0	.11 hrs, Volume .57 hrs, Volume .57 hrs, Volume .00 hrs, Volume	e= 0.04 e= 0.04 e= 0.04	1 af, Atten= 80%, Lag= 27.1 min 1 af
			ime Span= 0.00		
Peak Ele	ev= 122.28' @ 1	2.57 hrs S	Surf.Area= 2,23	5 sf Storage=	594 cf
			culated: outflow n (777.7 - 745.2		()
Volume	Invert	Avail.Stora	age Storage D	escription	
#1	122.00'	5,937	7 cf Custom S	Stage Data (Pri	smatic) Listed below (Recalc)
Elevatio	on Surf.A		Ina Stara	Cum.Store	
			Inc.Store	-	
(fee	t) (s	q-ft) ((cubic-feet)	(cubic-feet)	
122.0	t) (s 00 1,	q-ft) (,944	(cubic-feet) 0	(cubic-feet) 0	
· · · · ·	t) (s 00 1,	q-ft) ((cubic-feet)	(cubic-feet)	
122.0	t) (s 00 1,	q-ft) (944 993	(cubic-feet) 0	(cubic-feet) 0	
122.0 124.0 <u>Device</u> #1	t) (s 00 1, 00 3, Routing Primary	<u>q-ft) (</u> 944 993 <u>Invert</u> 123.50'	(cubic-feet) 0 5,937 Outlet Devices 9.0' long Shar	(cubic-feet) 0 5,937 p-Crested Rec	angular Weir 2 End Contraction(s)
122.0 124.0 Device	t) (s 00 1, 00 3, Routing	<u>q-ft) (</u> 944 993 <u>Invert</u> 123.50'	(cubic-feet) 0 5,937 Outlet Devices	(cubic-feet) 0 5,937 p-Crested Rec	•

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=122.00' TW=0.00' (Dynamic Tailwater) **1=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond P-2: Infiltration Basin

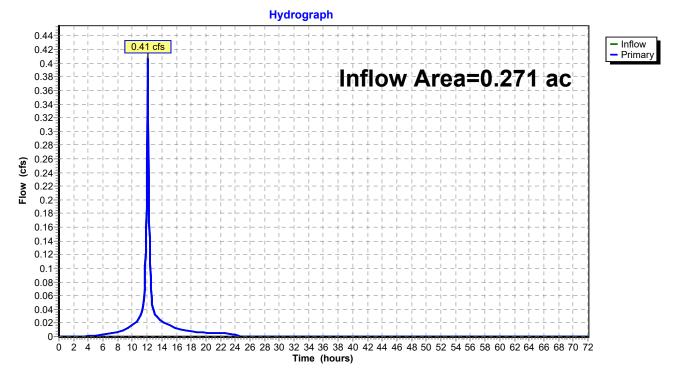


Summary for Link DP-1: West Wetlands

Inflow Area	=	0.271 ac,	4.58% Impervious,	Inflow Depth = 1.4	40" for 1-Year event
Inflow =	=	0.41 cfs @	12.09 hrs, Volum	e= 0.032 af	
Primary =	=	0.41 cfs @	12.09 hrs, Volum	e= 0.032 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: West Wetlands

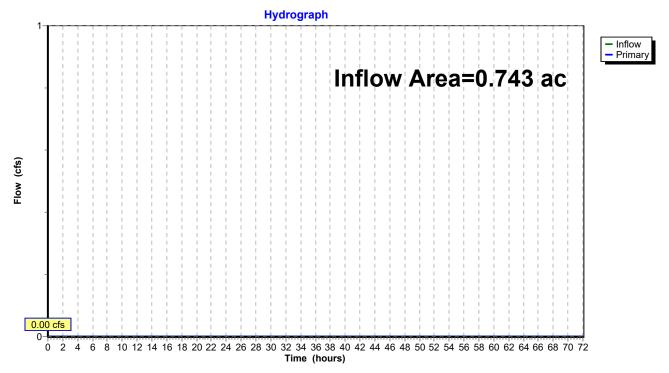


Summary for Link DP-2: East Low Point

Inflow Area	a =	0.743 ac, 24	4.58% Impervious,	Inflow Depth = 0.00	" for 1-Year event
Inflow	=	0.00 cfs @	0.00 hrs, Volume=	= 0.000 af	
Primary	=	0.00 cfs @	0.00 hrs, Volume=	= 0.000 af, <i>A</i>	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: East Low Point



Millis Well 3 Proposed Prepared by Kleinfelder HydroCAD® 10.20-2f s/n 00759 © 2022 HydroCAD Softwa	Type III 24-hr 2-Year Rainfall=3.39" Printed 1/11/2024 re Solutions LLC Page 16
Time span=0.00-72.00 hrs, Runoff by SCS TR-20 metho Reach routing by Dyn-Stor-Ind method	d, UH=SCS, Weighted-Q
SubcatchmentSC-1: Overland to West Runoff Ar	ea=3,356 sf 15.85% Impervious Runoff Depth=1.87" Tc=6.0 min CN=WQ Runoff=0.15 cfs 0.012 af
SubcatchmentSC-2: Overland to Forebay Runoff Are	a=11,864 sf 62.53% Impervious Runoff Depth=1.98" Tc=6.0 min CN=WQ Runoff=0.55 cfs 0.045 af
SubcatchmentSC-3: Overland to Basin Runoff A	rea=9,595 sf 0.00% Impervious Runoff Depth=0.80" Tc=6.0 min CN=WQ Runoff=0.18 cfs 0.015 af
SubcatchmentSC-4: Basin Berm and Runoff A	rea=7,531 sf 0.00% Impervious Runoff Depth=0.00" Tc=6.0 min CN=32 Runoff=0.00 cfs 0.000 af
SubcatchmentSC-5: Overland to West Runoff Ar	ea=11,789 sf 4.58% Impervious Runoff Depth=1.77" Tc=6.0 min CN=WQ Runoff=0.51 cfs 0.040 af
	lev=123.43' Storage=127 cf Inflow=0.70 cfs 0.057 af Primary=0.61 cfs 0.039 af Outflow=0.63 cfs 0.057 af
	lev=122.39' Storage=829 cf Inflow=0.78 cfs 0.054 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.054 af
Link DP-1: West Wetlands	Inflow=0.51 cfs 0.040 af Primary=0.51 cfs 0.040 af
Link DP-2: East Low Point	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af

Total Runoff Area = 1.013 acRunoff Volume = 0.111 afAverage Runoff Depth = 1.32"80.76% Pervious = 0.818 ac19.24% Impervious = 0.195 ac

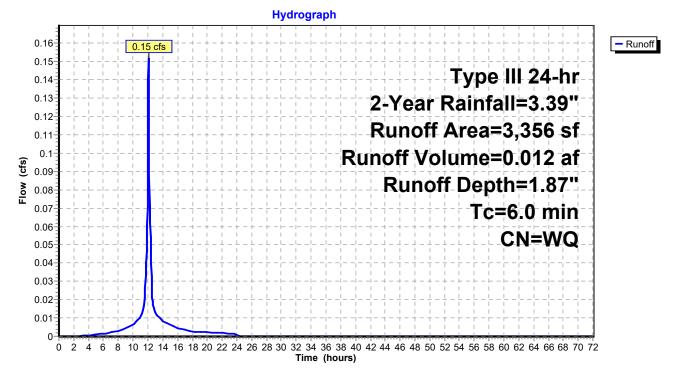
Summary for Subcatchment SC-1: Overland to West Wetland

Runoff = 0.15 cfs @ 12.09 hrs, Volume= Routed to Pond P-1 : Forebay 0.012 af, Depth= 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 2-Year Rainfall=3.39"

A	rea (sf)	CN	Description		
	532	98	Paved parki	ng, HSG A	N Contraction of the second
	1,256	39	Pasture/gra	ssland/rang	ge, Good, HSG A
	1,568	96	Gravel surfa	ace, HSG A	Α
	3,356		Weighted A	verage	
	2,824	71	84.15% Per	vious Area	
	532	98	15.85% Imp	ervious Ar	ea
Tc (min)	Length (feet)	Slop (ft/f	,	Capacity (cfs)	Description
6.0					Direct Entry, Tc Min

Subcatchment SC-1: Overland to West Wetland



Summary for Subcatchment SC-2: Overland to Forebay

0.55 cfs @ 12.09 hrs, Volume= Runoff = Routed to Pond P-1 : Forebay

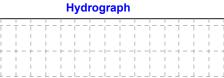
0.6

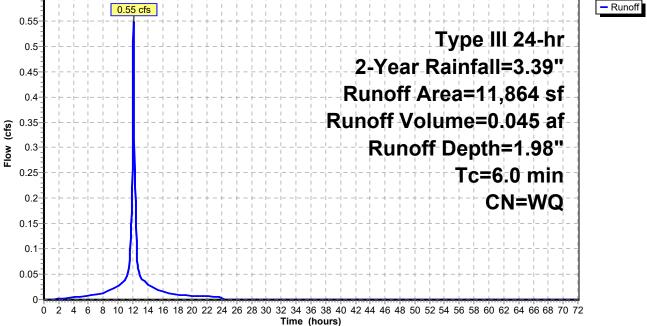
0.045 af, Depth= 1.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 2-Year Rainfall=3.39"

A	rea (sf)	CN	Description		
	7,418	98	Paved park	ing, HSG A	N
	4,446	39	Pasture/gra	ssland/rang	ge, Good, HSG A
	11,864		Weighted A	verage	
	4,446	39	37.47% Pe	rvious Area	l de la constante d
	7,418	98	62.53% Imp	pervious Ar	ea
Tc (min)	Length (feet)	Slop (ft/f		Capacity (cfs)	Description
6.0					Direct Entry, Tc Min

Subcatchment SC-2: Overland to Forebay





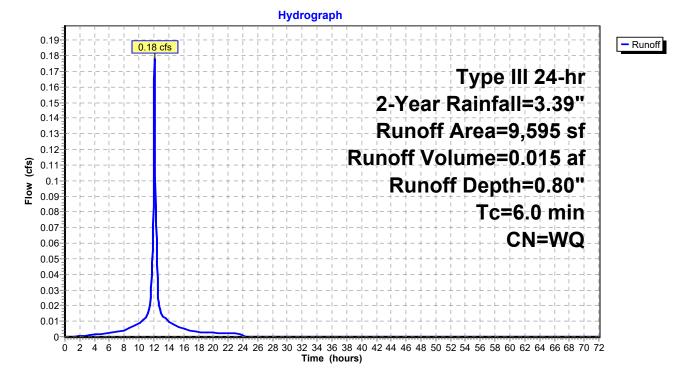
Summary for Subcatchment SC-3: Overland to Basin

Runoff = 0.18 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 0.80" Routed to Pond P-2 : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 2-Year Rainfall=3.39"

A	rea (sf)	CN	Description		
	2,407	98	Water Surfa	ace, 0% imp	p, HSG A
	7,188	39	Pasture/gra	ssland/ran	ge, Good, HSG A
	9,595		Weighted A	verage	
	9,595	54	100.00% P	ervious Are	a
-		~		o "	
Tc	Length	Slop		Capacity	Description
(min)	(feet)	(ft/f	t) (ft/sec)	(cfs)	
6.0					Direct Entry, Tc Min
					•

Subcatchment SC-3: Overland to Basin



Summary for Subcatchment SC-4: Basin Berm and Shoulder

Runoff = 0.00 cfs @ 0.00 hrs, Volume= Routed to Link DP-2 : East Low Point 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 2-Year Rainfall=3.39"

A	vrea (sf)		escription			
	7,531				Good, HSG A	
	7,531	32 1	00.00% Pe	ervious Are	a	
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description	
6.0	(1001)	(10/10)	(14000)	(010)	Direct Entry, Tc Min	
		S	ubcatch	ment SC	-4: Basin Berm and Shoulder	
				Hydro	ograph	
0-					Type III 24-hr 2-Year Rainfall=3.39" Runoff Area=7,531 sf Runoff Volume=0.000 af Runoff Depth=0.00" Tc=6.0 min CN=32	off
		10 12 14	 6 18 20 22 24		34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 me (hours)	

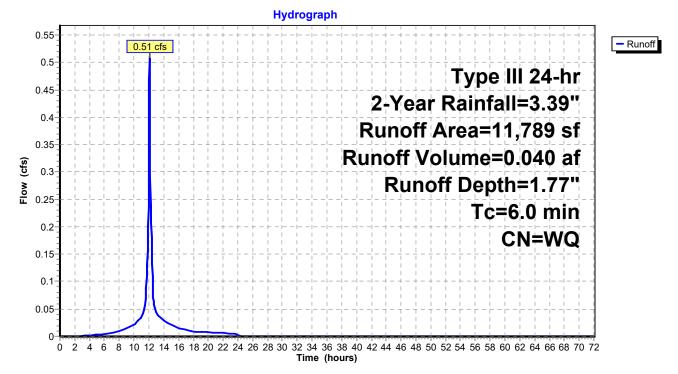
Summary for Subcatchment SC-5: Overland to West Wetland

Runoff = 0.51 cfs @ 12.09 hrs, Volume= Routed to Link DP-1 : West Wetlands 0.040 af, Depth= 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 2-Year Rainfall=3.39"

A	Area (sf)	CN	Description		
*	540	98	Impervious,	, HSG A	
	4,724	39	Pasture/gra	ssland/rang	ge, Good, HSG A
	6,525	96	Gravel surfa	ace, HSG A	A
	11,789		Weighted A	verage	
	11,249	72	95.42% Per	rvious Area	
	540	98	4.58% Impe	ervious Are	a
Tc (min)	Length (feet)	Slop (ft/f		Capacity (cfs)	Description
6.0					Direct Entry, Tc Min

Subcatchment SC-5: Overland to West Wetland

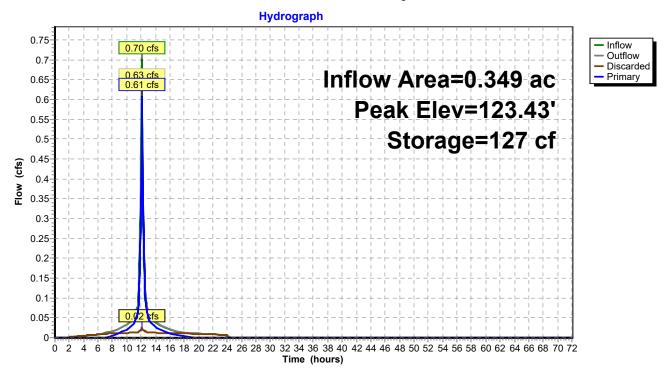


Summary for Pond P-1: Forebay

Inflow = 0.70 cfs @ Outflow = 0.63 cfs @ Discarded = 0.02 cfs @	2.23% Impervious, Int 12.09 hrs, Volume= 12.13 hrs, Volume= 12.13 hrs, Volume= 12.13 hrs, Volume= on Basin	0.057 af 0.057 af, A 0.018 af	' for 2-Year event tten= 10%, Lag= 2.3 min
Routing by Dyn-Stor-Ind method Peak Elev= 123.43' @ 12.13 hrs	, Time Span= 0.00-72		rs
Plug-Flow detention time= (not c Center-of-Mass det. time= 5.1 m	in(763.5 - 758.3)		
	orage Storage Desc		
#1 123.00' 4	172 cf Custom Stag	ge Data (Prismatic	Listed below (Recalc)
Elevation Surf.Area (feet) (sq-ft)	-	Cum.Store cubic-feet)	
123.00 165	0	0	
124.00 779	472	472	
Device Routing Invert			
#1 Primary 123.00 #2 Discarded 123.00	L= 69.0' CPP, mit Inlet / Outlet Invert n= 0.013 Corrugat	tered to conform to = 123.00' / 122.50' ted PE, smooth inte	S= 0.0072 '/' Cc= 0.900 rior, Flow Area= 0.79 sf
Discarded OutFlow Max=0.02	cfs @ 12.13 hrs_HW=	=123.42' (Free Dis	charge)

Discarded OutFlow Max=0.02 cfs @ 12.13 hrs HW=123.42' (Free Discharge) **2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.60 cfs @ 12.13 hrs HW=123.42' TW=122.20' (Dynamic Tailwater) ☐ 1=Culvert (Barrel Controls 0.60 cfs @ 2.77 fps) Pond P-1: Forebay

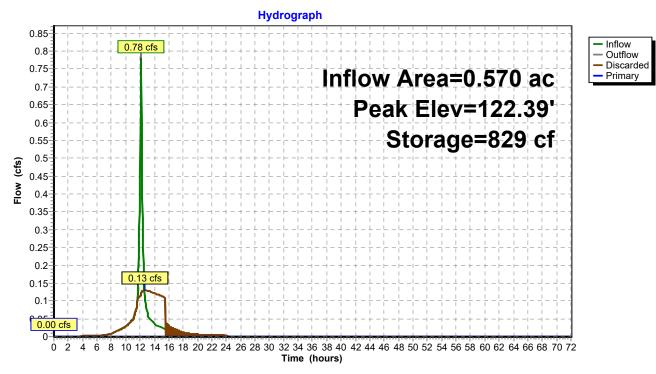


Summary for Pond P-2: Infiltration Basin

Inflow Ard Inflow Outflow Discarde Primary Route	= 0.78 = 0.13 d = 0.13	cfs @ 12 cfs @ 12 cfs @ 12 cfs @ 12	04% Impervious, Inflow Depth = 1.13" for 2-Year event 2.11 hrs, Volume= 0.054 af 2.61 hrs, Volume= 0.054 af, Atten= 83%, Lag= 29.8 min 2.61 hrs, Volume= 0.054 af 0.00 hrs, Volume= 0.000 af w Point 0.000 af
			Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Surf.Area= 2,340 sf Storage= 829 cf
Plug-Flov	w detention time	e= (not cal e= 45.2 m	Iculated: outflow precedes inflow) in(790.0 - 744.8) rrage Storage Description
#1	122.00'		37 cf Custom Stage Data (Prismatic)Listed below (Recalc)
Elevation (feet 122.00 124.00	t) (se 0 1,	vrea q-ft <u>)</u> 944 993	Inc.Store (cubic-feet)Cum.Store (cubic-feet)005,9375,937
Device	Routing	Invert	Outlet Devices
		400 501	9.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
	Primary Discarded	123.50 [°] 122.00'	

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=122.00' TW=0.00' (Dynamic Tailwater) **1=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond P-2: Infiltration Basin

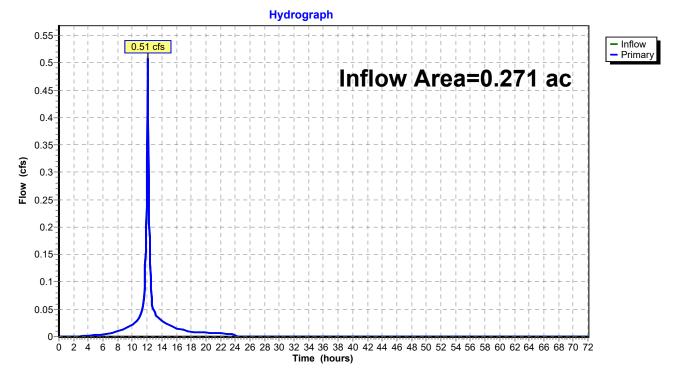


Summary for Link DP-1: West Wetlands

Inflow Area	a =	0.271 ac,	4.58% Impervious,	Inflow Depth = 1.7	7" for 2-Year event
Inflow	=	0.51 cfs @	12.09 hrs, Volume	e= 0.040 af	
Primary	=	0.51 cfs @	12.09 hrs, Volume	e= 0.040 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: West Wetlands

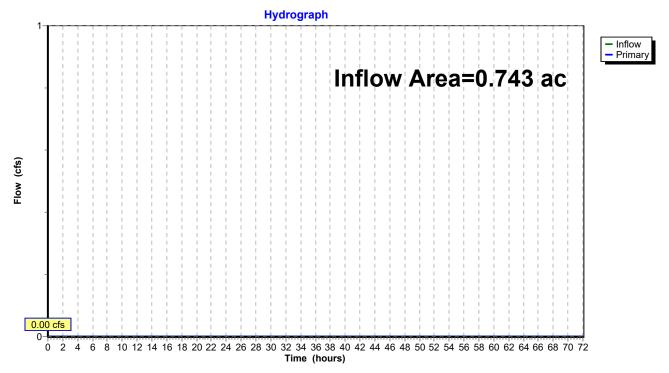


Summary for Link DP-2: East Low Point

Inflow Area	a =	0.743 ac, 24	4.58% Impervious,	Inflow Depth = 0.0	00" for 2-Year event
Inflow	=	0.00 cfs @	0.00 hrs, Volume	= 0.000 af	
Primary	=	0.00 cfs @	0.00 hrs, Volume	e= 0.000 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: East Low Point



Millis Well 3 Proposed Prepared by Kleinfelder HydroCAD® 10.20-2f s/n 00759 © 2022 HydroCAD	Type III 24-hr 5-Year Rainfall=4.42"Printed 1/11/2024O Software Solutions LLCPage 28
Runoff by SCS TR-20	00 hrs, dt=0.05 hrs, 1441 points) method, UH=SCS, Weighted-Q ethod - Pond routing by Dyn-Stor-Ind method
SubcatchmentSC-1: Overland to West	Runoff Area=3,356 sf 15.85% Impervious Runoff Depth=2.55" Tc=6.0 min CN=WQ Runoff=0.20 cfs 0.016 af
SubcatchmentSC-2: Overland to Forebay Ru	noff Area=11,864 sf 62.53% Impervious Runoff Depth=2.65" Tc=6.0 min CN=WQ Runoff=0.72 cfs 0.060 af
SubcatchmentSC-3: Overland to Basin	Runoff Area=9,595 sf 0.00% Impervious Runoff Depth=1.12" Tc=6.0 min CN=WQ Runoff=0.23 cfs 0.021 af
SubcatchmentSC-4: Basin Berm and	Runoff Area=7,531 sf 0.00% Impervious Runoff Depth=0.00" Tc=6.0 min CN=32 Runoff=0.00 cfs 0.000 af
SubcatchmentSC-5: Overland to West	Runoff Area=11,789 sf 4.58% Impervious Runoff Depth=2.42" Tc=6.0 min CN=WQ Runoff=0.67 cfs 0.055 af
Pond P-1: Forebay Discarded=0.03 cfs 0.	Peak Elev=123.50' Storage=160 cf Inflow=0.92 cfs 0.077 af 020 af Primary=0.81 cfs 0.056 af Outflow=0.83 cfs 0.077 af
	Peak Elev=122.55' Storage=1,229 cf Inflow=1.03 cfs 0.077 af 077 af Primary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.077 af
Link DP-1: West Wetlands	Inflow=0.67 cfs 0.055 af Primary=0.67 cfs 0.055 af
Link DP-2: East Low Point	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af

Total Runoff Area = 1.013 acRunoff Volume = 0.152 afAverage Runoff Depth = 1.80"80.76% Pervious = 0.818 ac19.24% Impervious = 0.195 ac

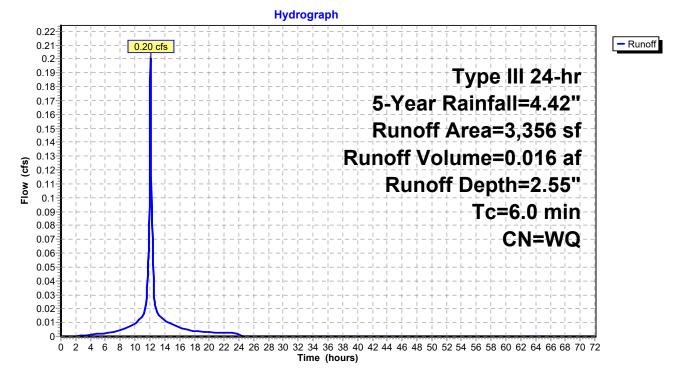
Summary for Subcatchment SC-1: Overland to West Wetland

Runoff = 0.20 cfs @ 12.09 hrs, Volume= Routed to Pond P-1 : Forebay 0.016 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 5-Year Rainfall=4.42"

A	rea (sf)	CN	Description			
	532	98	Paved parking, HSG A			
	1,256	39	Pasture/grassland/range, Good, HSG A			
	1,568	96	Gravel surface, HSG A			
	3,356		Weighted Average			
	2,824	71	84.15% Pervious Area			
	532	98	15.85% Impervious Area			
Тс	Length	Slop	pe Velocity Capacity Description			
(min)	(feet)	(ft/1	ft) (ft/sec) (cfs)			
6.0			Direct Entry, Tc Min			

Subcatchment SC-1: Overland to West Wetland



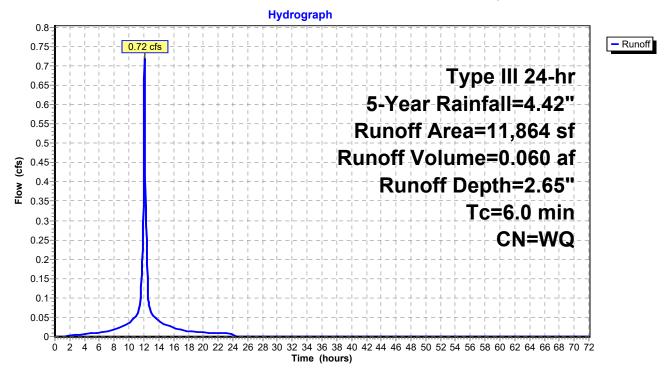
Summary for Subcatchment SC-2: Overland to Forebay

Runoff = 0.72 cfs @ 12.09 hrs, Volume= Routed to Pond P-1 : Forebay 0.060 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 5-Year Rainfall=4.42"

A	rea (sf)	CN	Description		
	7,418	98	Paved park	ing, HSG A	N
	4,446	39	Pasture/gra	ssland/rang	ge, Good, HSG A
	11,864		Weighted A	verage	
	4,446	39	37.47% Pe	rvious Area	
	7,418	98	62.53% Imp	pervious Ar	ea
Tc (min)	Length (feet)	Slop (ft/f		Capacity (cfs)	Description
6.0					Direct Entry, Tc Min
(min)	4,446 7,418 Length	98 Slop	37.47% Pei 62.53% Imp e Velocity	rvious Area pervious Are Capacity	ea Description

Subcatchment SC-2: Overland to Forebay



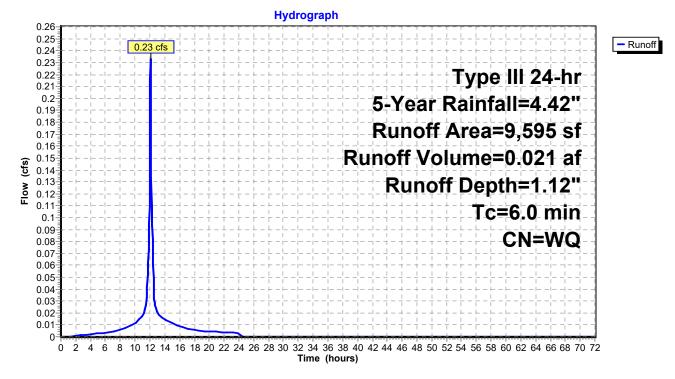
Summary for Subcatchment SC-3: Overland to Basin

Runoff = 0.23 cfs @ 12.09 hrs, Volume= 0.021 af, Depth= 1.12" Routed to Pond P-2 : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 5-Year Rainfall=4.42"

A	rea (sf)	CN	Description		
	2,407	98	Water Surfa	ace, 0% im	o, HSG A
	7,188	39	Pasture/gra	ssland/ran	ge, Good, HSG A
	9,595		Weighted A	verage	
	9,595	54	100.00% P	ervious Are	а
_		.			
Тс	Length	Slop	,	Capacity	Description
(min)	(feet)	(ft/f	t) (ft/sec)	(cfs)	
6.0					Direct Entry, Tc Min
					•

Subcatchment SC-3: Overland to Basin



Summary for Subcatchment SC-4: Basin Berm and Shoulder

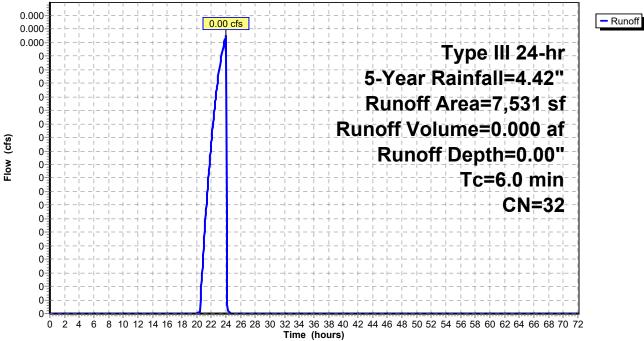
Runoff = 0.00 cfs @ 24.00 hrs, Volume= Routed to Link DP-2 : East Low Point 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 5-Year Rainfall=4.42"

A	rea (sf)	CN	Description		
	7,531	32	Woods/gras	ss comb., G	Good, HSG A
	7,531	32	100.00% Pe	ervious Are	ea
Tc (min)	Length (feet)	Slope (ft/ft		Capacity (cfs)	Description
6.0					Direct Entry, Tc Min

Subcatchment SC-4: Basin Berm and Shoulder

Hydrograph



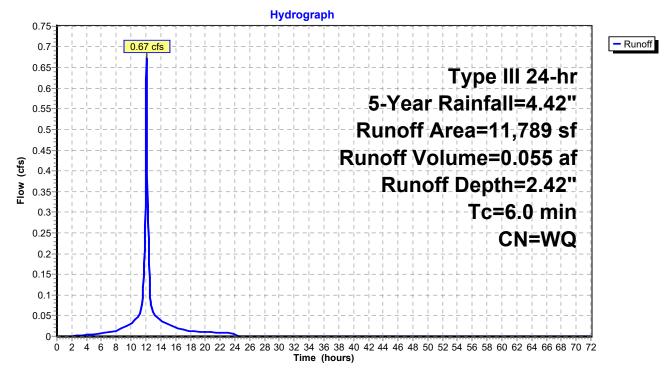
Summary for Subcatchment SC-5: Overland to West Wetland

Runoff = 0.67 cfs @ 12.09 hrs, Volume= Routed to Link DP-1 : West Wetlands 0.055 af, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 5-Year Rainfall=4.42"

	Area (sf)	CN	Description				
*	540	98	Impervious	, HSG A			
	4,724	39	Pasture/gra	Pasture/grassland/range, Good, HSG A			
	6,525	96	Gravel surf	Gravel surface, HSG A			
	11,789		Weighted A	verage			
	11,249	72	95.42% Pe	rvious Area	1		
	540	98	4.58% Impe	ervious Are	а		
Tc (min)		Slop (ft/f		Capacity (cfs)	Description		
6.0					Direct Entry, Tc Min		

Subcatchment SC-5: Overland to West Wetland

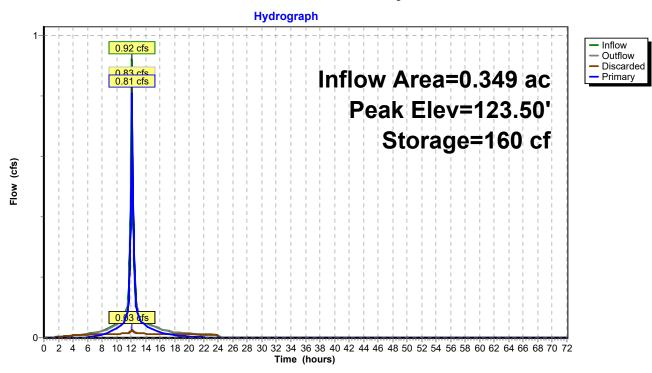


Summary for Pond P-1: Forebay

Inflow = 0.92 cfs @ 1 Outflow = 0.83 cfs @ 1 Discarded = 0.03 cfs @ 1 Primary = 0.81 cfs @ 1	12.09 hrs, Volume= 12.12 hrs, Volume= 12.12 hrs, Volume= 12.12 hrs, Volume=	Depth = 2.63" for 5-Year event 0.077 af 0.077 af, Atten= 9%, Lag= 2.3 min 0.020 af 0.056 af						
Routed to Pond P-2 : Infiltration Basin Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 123.50' @ 12.12 hrs Surf.Area= 473 sf Storage= 160 cf								
Plug-Flow detention time= 5.3 min calculated for 0.077 af (100% of inflow) Center-of-Mass det. time= 5.3 min (762.2 - 756.9)								
	orage Storage Descript							
#1 123.00' 4	72 cf Custom Stage D	Data (Prismatic)Listed below (Recalc)						
Elevation Surf.Area (feet) (sq-ft)		.Store c-feet)						
123.00 165	0	0						
124.00 779	472	472						
Device Routing Invert	Outlet Devices							
#1 Primary 123.00' 12.0" Round Culvert L= 69.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 123.00' / 122.50' S= 0.0072 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf #2 Discarded 123.00' 2.410 in/hr Exfiltration over Surface area								
Discarded OutFlow Max=0.03 cfs @ 12.12 hrs HW=123.49' (Free Discharge)								

Discarded OutFlow Max=0.03 cfs @ 12.12 hrs HW=123.49' (Free Discharge) **2=Exfiltration** (Exfiltration Controls 0.03 cfs)

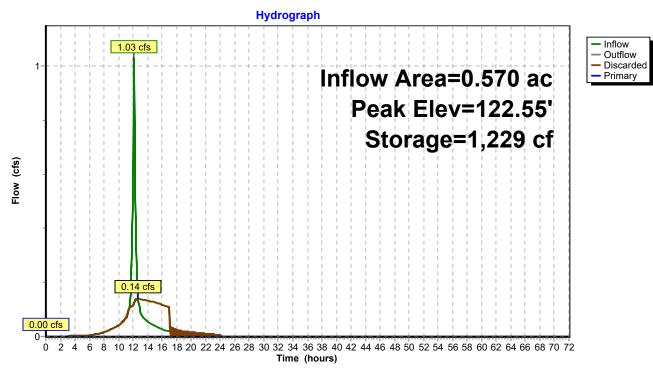
Primary OutFlow Max=0.79 cfs @ 12.12 hrs HW=123.49' TW=122.30' (Dynamic Tailwater) ☐ 1=Culvert (Barrel Controls 0.79 cfs @ 2.97 fps) Pond P-1: Forebay



Summary for Pond P-2: Infiltration Basin

Inflow Outflow Discarde Primary	Outflow = 0.14 cfs @ 12.68 hrs, Volume= 0.077 af, Atten= 86%, Lag= 33.8 min Discarded = 0.14 cfs @ 12.68 hrs, Volume= 0.077 af							
				0-72.00 hrs, dt= (
Peak Ele	ev= 122.55' @ 1	2.68 hrs S	urf.Area= 2,51	0 sf Storage= 1	229 cf			
	Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 65.4 min (819.0 - 753.6)							
Volume	Invert	Avail.Stora	age Storage [Description				
#1	122.00'	5,937	′ cf Custom	Stage Data (Pris	matic)Listed below (Recalc)			
Elevatic (fee			Inc.Store	Cum.Store				
		4-11) (1	cubic-feet)	(cubic-feet)				
122.0	00 1,	944	0	(cubic-feet) 0				
122.0 124.0	,			<i>L</i>				
	,	944 993	0	0 5,937				
124.0	00 3,	944 993 Invert 123.50'	0 5,937 Outlet Devices 9.0' long Shar	0 5,937	ngular Weir 2 End Contraction(s)			

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=122.00' TW=0.00' (Dynamic Tailwater) **1=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs) Pond P-2: Infiltration Basin

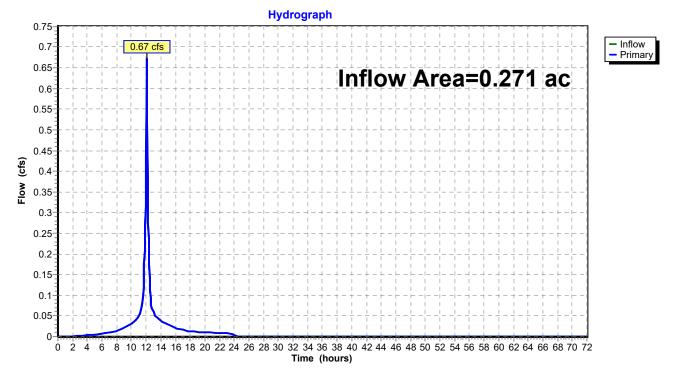


Summary for Link DP-1: West Wetlands

Inflow Area =		0.271 ac,	4.58% Impervious, Inflow	Depth = 2.42"	for 5-Year event
Inflow	=	0.67 cfs @	12.09 hrs, Volume=	0.055 af	
Primary	=	0.67 cfs @	12.09 hrs, Volume=	0.055 af, Atte	en= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: West Wetlands

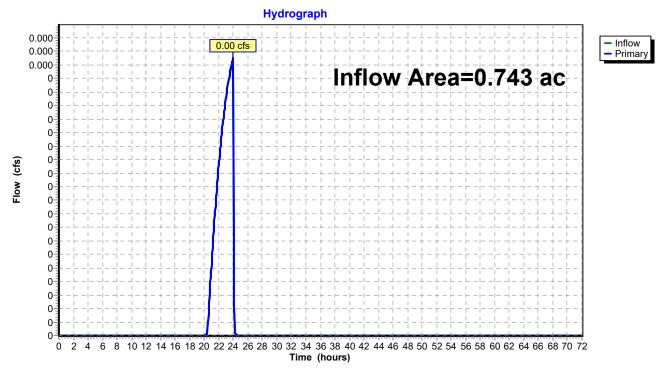


Summary for Link DP-2: East Low Point

Inflow Area :	=	0.743 ac, 24.58% Impervious, Inflow Depth = 0.00" for 5-Year	⁻ event
Inflow =	=	0.00 cfs @ 24.00 hrs, Volume= 0.000 af	
Primary =	=	0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Atten= 0%, La	g= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: East Low Point



Millis Well 3 Proposed Prepared by Kleinfelder HydroCAD® 10.20-2f s/n 00759 © 2022 Hydro	Type III 24-hr 10-Year Rainfall=5.28"Printed 1/11/2024CAD Software Solutions LLCPage 40
Runoff by SCS TF	-72.00 hrs, dt=0.05 hrs, 1441 points R-20 method, UH=SCS, Weighted-Q I method . Pond routing by Dyn-Stor-Ind method
SubcatchmentSC-1: Overland to West	Runoff Area=3,356 sf 15.85% Impervious Runoff Depth=3.14" Tc=6.0 min CN=WQ Runoff=0.24 cfs 0.020 af
SubcatchmentSC-2: Overland to Forebay	Runoff Area=11,864 sf 62.53% Impervious Runoff Depth=3.25" Tc=6.0 min CN=WQ Runoff=0.86 cfs 0.074 af
SubcatchmentSC-3: Overland to Basin	Runoff Area=9,595 sf 0.00% Impervious Runoff Depth=1.46" Tc=6.0 min CN=WQ Runoff=0.28 cfs 0.027 af
SubcatchmentSC-4: Basin Berm and	Runoff Area=7,531 sf 0.00% Impervious Runoff Depth=0.05" Tc=6.0 min CN=32 Runoff=0.00 cfs 0.001 af
SubcatchmentSC-5: Overland to West	Runoff Area=11,789 sf 4.58% Impervious Runoff Depth=3.00" Tc=6.0 min CN=WQ Runoff=0.81 cfs 0.068 af
Pond P-1: Forebay Discarded=0.03 cf	Peak Elev=123.56' Storage=188 cf Inflow=1.10 cfs 0.094 af s 0.022 af Primary=0.97 cfs 0.072 af Outflow=1.00 cfs 0.094 af
Pond P-2: Infiltration Basin Discarded=0.15 cf	Peak Elev=122.70' Storage=1,612 cf Inflow=1.23 cfs 0.099 af s 0.099 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.099 af
Link DP-1: West Wetlands	Inflow=0.81 cfs 0.068 af Primary=0.81 cfs 0.068 af
Link DP-2: East Low Point	Inflow=0.00 cfs 0.001 af Primary=0.00 cfs 0.001 af

Total Runoff Area = 1.013 acRunoff Volume = 0.189 afAverage Runoff Depth = 2.24"80.76% Pervious = 0.818 ac19.24% Impervious = 0.195 ac

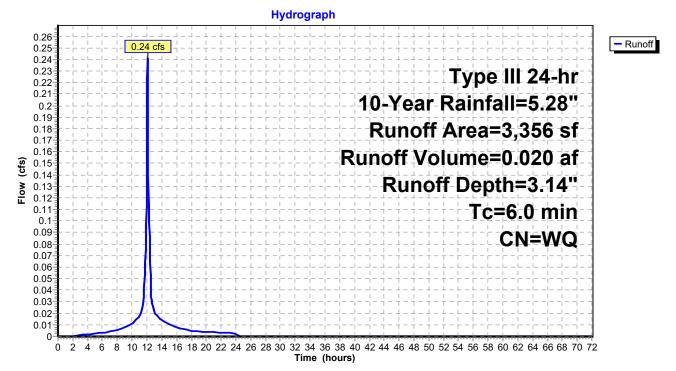
Summary for Subcatchment SC-1: Overland to West Wetland

Runoff = 0.24 cfs @ 12.09 hrs, Volume= Routed to Pond P-1 : Forebay 0.020 af, Depth= 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 10-Year Rainfall=5.28"

A	rea (sf)	CN	Description				
	532	98	Paved park	ing, HSG A	N Contraction of the second seco		
	1,256	39	Pasture/gra	ssland/rang	ge, Good, HSG A		
	1,568	96	Gravel surfa	ace, HSG A	Â		
	3,356		Weighted Average				
	2,824	71	84.15% Pervious Area				
	532	98	15.85% Impervious Area				
Тс	Length	Slop		Capacity	Description		
<u>(min)</u>	(feet)	(ft/f	t) (ft/sec)	(cfs)			
6.0					Direct Entry, Tc Min		

Subcatchment SC-1: Overland to West Wetland



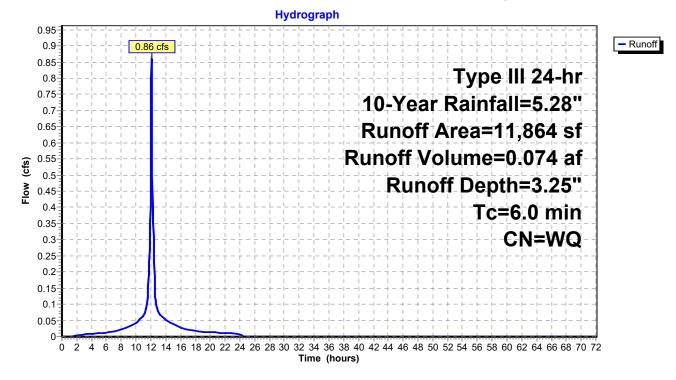
Summary for Subcatchment SC-2: Overland to Forebay

Runoff = 0.86 cfs @ 12.09 hrs, Volume= Routed to Pond P-1 : Forebay 0.074 af, Depth= 3.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 10-Year Rainfall=5.28"

Α	rea (sf)	CN	Description					
	7,418	98	Paved park	ing, HSG A	A			
	4,446	39	Pasture/gra	ssland/rang	ge, Good, HSG A			
	11,864		Weighted Average					
	4,446	39						
	7,418	98	62.53% Impervious Area					
Tc (min)	Length (feet)	Slop (ft/f		Capacity (cfs)	Description			
6.0					Direct Entry, Tc Min			

Subcatchment SC-2: Overland to Forebay



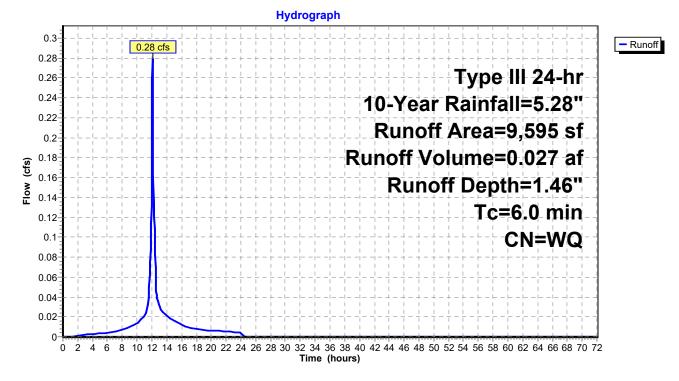
Summary for Subcatchment SC-3: Overland to Basin

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.027 af, Depth= 1.46" Routed to Pond P-2 : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 10-Year Rainfall=5.28"

A	rea (sf)	CN	Description				
	2,407	98	Water Surfa	ace, 0% im	p, HSG A		
	7,188	39	Pasture/gra	ssland/ran	ge, Good, HSG A		
	9,595		Weighted Average				
	9,595	54	100.00% Pervious Area				
Тс	Length	Slop	,	Capacity	Description		
(min)	(feet)	(ft/f	t) (ft/sec)	(cfs)			
6.0					Direct Entry, Tc Min		

Subcatchment SC-3: Overland to Basin



Summary for Subcatchment SC-4: Basin Berm and Shoulder

Runoff = 0.00 cfs @ 16.79 hrs, Volume= Routed to Link DP-2 : East Low Point 0.001 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 10-Year Rainfall=5.28"

A	rea (sf)	CN	Description					
	7,531	32	Woods/grass comb., Good, HSG A					
	7,531	32	100.00% Pervious Area					
Tc _(min)	Length (feet)	Slope (ft/ft		Capacity (cfs)	Description			
6.0					Direct Entry, Tc Min			

Subcatchment SC-4: Basin Berm and Shoulder

Hydrograph 0.001 - Runoff 0.00 cfs 0.001 0.001 Type III 24-hr 0.001 0.001 10-Year Rainfall=5.28" 0.001 0.001 Runoff Area=7,531 sf 0.001 Runoff Volume=0.001 af 0.001 (cfs) 0.001 Runoff Depth=0.05" 0.001 Flow 0.001 Tc=6.0 min 0.000 0.000-CN=32 0.000 0.000 0.000-0.000-0.000-0-0-0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 0 Time (hours)

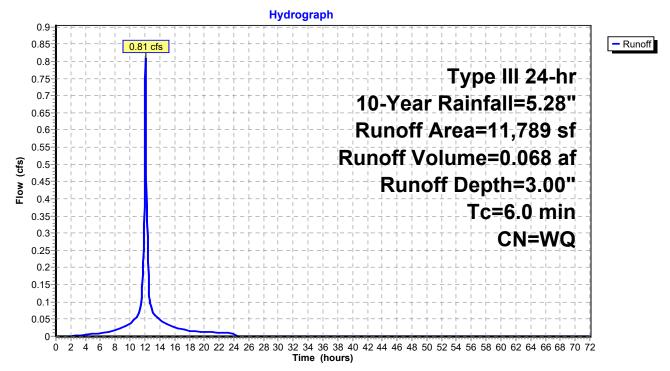
Summary for Subcatchment SC-5: Overland to West Wetland

Runoff = 0.81 cfs @ 12.09 hrs, Volume= Routed to Link DP-1 : West Wetlands 0.068 af, Depth= 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 10-Year Rainfall=5.28"

A	Area (sf)	CN	Description				
*	540	98	Impervious	, HSG A			
	4,724	39	Pasture/gra	ssland/rang	ge, Good, HSG A		
	6,525	96	Gravel surfa	ace, HSG A	4		
	11,789		Weighted Average				
	11,249	72	95.42% Pervious Area				
	540	98	4.58% Impervious Area				
Tc (min)		Slop (ft/f	,	Capacity (cfs)	Description		
6.0					Direct Entry, Tc Min		

Subcatchment SC-5: Overland to West Wetland

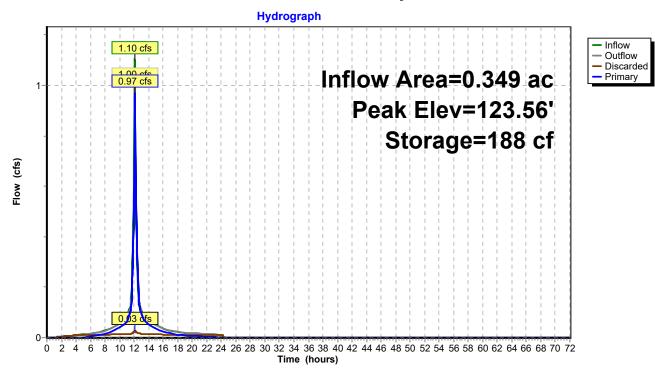


Summary for Pond P-1: Forebay

		n = 3.23" for 10-Year event)94 af						
<u> </u>		94 af, Atten= 9%, Lag= 2.3 min						
	,)22 af)72 af						
Routed to Pond P-2 : Infiltration								
	Baom							
Routing by Dyn-Stor-Ind method, Ti								
Peak Elev= 123.56' @ 12.12 hrs S	Surf.Area= 508 sf Storage=	188 cf						
Plug-Flow detention time= 5.3 min c	calculated for 0 094 af (100%	of inflow)						
Center-of-Mass det. time= 5.4 min (· · · · · · · · · · · · · · · · · · ·							
	. ,							
	age Storage Description							
#1 123.00' 472	2 cf Custom Stage Data (P	Prismatic)Listed below (Recalc)						
Elevation Surf.Area	Inc.Store Cum.Store							
	cubic-feet) (cubic-feet)							
123.00 165	0 0							
124.00 779	472 472							
Dovice Routing Invert	Outlet Devices							
5								
	#1 Primary 123.00' 12.0" Round Culvert L= 69.0' CPP, mitered to conform to fill, Ke= 0.700							
		/ 122.50' S= 0.0072 '/' Cc= 0.900						
		nooth interior, Flow Area= 0.79 sf						
	n= 0.010 Contugateur L, sit							
	2.410 in/hr Exfiltration over							

Discarded OutFlow Max=0.03 cfs @ 12.12 hrs HW=123.55' (Free Discharge) **2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.95 cfs @ 12.12 hrs HW=123.55' TW=122.38' (Dynamic Tailwater) ☐ 1=Culvert (Barrel Controls 0.95 cfs @ 3.10 fps) Pond P-1: Forebay

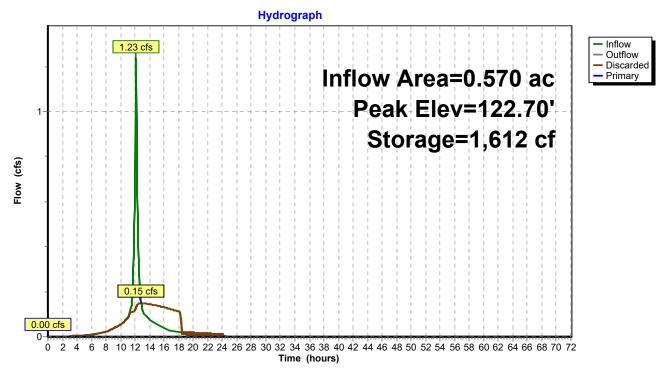


Summary for Pond P-2: Infiltration Basin

Inflow Area = 0.570 ac, 32.04% Impervious, Inflow Depth = 2.09" for 10-Year event Inflow = 1.23 cfs @ 12.11 hrs, Volume= 0.099 af Outflow = 0.15 cfs @ 12.81 hrs, Volume= 0.099 af, Atten= 88%, Lag= 41.9 min Discarded = 0.15 cfs @ 12.81 hrs, Volume= 0.099 af Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.009 af Routed to Link DP-2 : East Low Point 0.000 af 0.000 af									
	Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs								
Peak Ele	ev= 122.70' @ 1	2.81 hrs Su	urf.Area= 2,66	31 sf Storage=	1,612 cf				
•	Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 85.2 min(845.4 - 760.2)								
Volume	Invert	Avail.Storag	ge Storage I	Description					
#1	122.00'	5,937	cf Custom	Stage Data (Pri	ismatic)Listed below (Recalc)				
Elevation Surf.Area Inc.Store Cum.Store									
Elevatio	on Surf.A	rea	Inc.Store	Cum.Store					
Elevatio			Inc.Store ubic-feet)	Cum.Store (cubic-feet)					
(fee 122.0	t) (so 00 1,5	q-ft) (c 944	ubic-feet) 0	(cubic-feet) 0					
(fee	t) (so 00 1,5	q-ft) (c	ubic-feet)	(cubic-feet)					
(fee 122.0	t) (so 00 1,5	<u>q-ft) (c</u> 944 993	ubic-feet) 0	(cubic-feet) 0 5,937					
(fee 122.0 124.0	t) (so 00 1, 00 3,	944 993 <u>Invert C</u> 123.50' 9	ubic-feet) 0 5,937 Outlet Devices 0.0' Iong Shar	(cubic-feet) 0 5,937	tangular Weir 2 End Contraction(s)				

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=122.00' TW=0.00' (Dynamic Tailwater) **1=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond P-2: Infiltration Basin

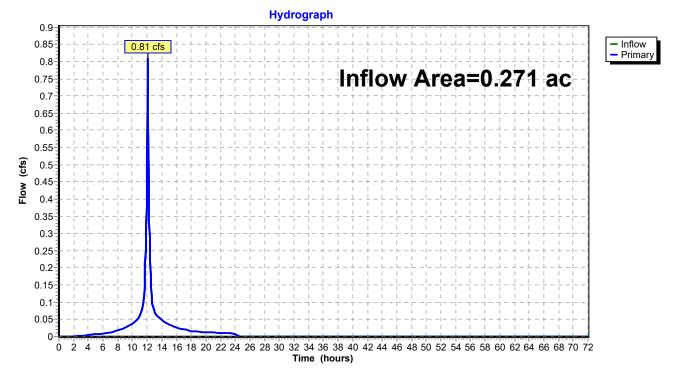


Summary for Link DP-1: West Wetlands

Inflow Area =	0.271 ac,	4.58% Impervious, Infl	ow Depth = 3.00"	for 10-Year event
Inflow =	0.81 cfs @	12.09 hrs, Volume=	0.068 af	
Primary =	0.81 cfs @	12.09 hrs, Volume=	0.068 af, Atte	en= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: West Wetlands

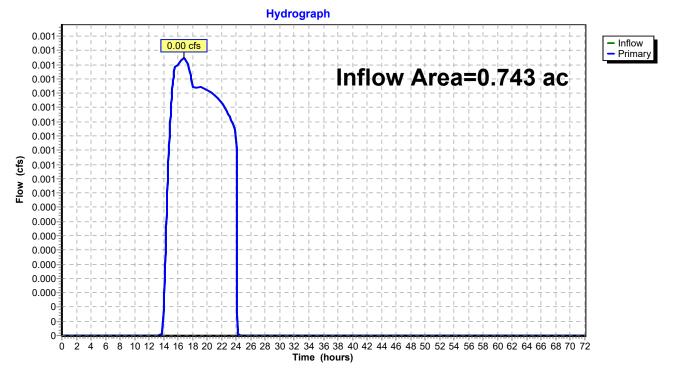


Summary for Link DP-2: East Low Point

Inflow Area	a =	0.743 ac, 24.58% Impervious, Inflow Depth = 0.01" for 10-	·Year event
Inflow	=	0.00 cfs @ 16.79 hrs, Volume= 0.001 af	
Primary	=	0.00 cfs @ 16.79 hrs, Volume= 0.001 af, Atten= 0%,	Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: East Low Point



Millis Well 3 Proposed Prepared by Kleinfelder HydroCAD® 10.20-2f s/n 00759 © 2022 Hydro	Type III 24-hr 25-Year Rainfall=6.45"Printed 1/11/2024CAD Software Solutions LLCPage 52						
Time span=0.00- Runoff by SCS TF	Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points Runoff by SCS TR-20 method, UH=SCS, Weighted-Q Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method						
SubcatchmentSC-1: Overland to West	Runoff Area=3,356 sf 15.85% Impervious Runoff Depth=3.99" Tc=6.0 min CN=WQ Runoff=0.30 cfs 0.026 af						
SubcatchmentSC-2: Overland to Forebay	Runoff Area=11,864 sf 62.53% Impervious Runoff Depth=4.10" Tc=6.0 min CN=WQ Runoff=1.06 cfs 0.093 af						
SubcatchmentSC-3: Overland to Basin	Runoff Area=9,595 sf 0.00% Impervious Runoff Depth=1.99" Tc=6.0 min CN=WQ Runoff=0.36 cfs 0.037 af						
SubcatchmentSC-4: Basin Berm and	Runoff Area=7,531 sf 0.00% Impervious Runoff Depth=0.21" Tc=6.0 min CN=32 Runoff=0.00 cfs 0.003 af						
SubcatchmentSC-5: Overland to West	Runoff Area=11,789 sf 4.58% Impervious Runoff Depth=3.83" Tc=6.0 min CN=WQ Runoff=1.01 cfs 0.086 af						
Pond P-1: Forebay Discarded=0.03 cfs	Peak Elev=123.63' Storage=227 cf Inflow=1.36 cfs 0.119 af s 0.023 af Primary=1.20 cfs 0.095 af Outflow=1.23 cfs 0.119 af						
Pond P-2: Infiltration Basin Discarded=0.16 cfs	Peak Elev=122.93' Storage=2,241 cf Inflow=1.55 cfs 0.132 af s 0.132 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.132 af						
Link DP-1: West Wetlands	Inflow=1.01 cfs 0.086 af Primary=1.01 cfs 0.086 af						
Link DP-2: East Low Point	Inflow=0.00 cfs 0.003 af Primary=0.00 cfs 0.003 af						

Total Runoff Area = 1.013 acRunoff Volume = 0.245 afAverage Runoff Depth = 2.90"80.76% Pervious = 0.818 ac19.24% Impervious = 0.195 ac

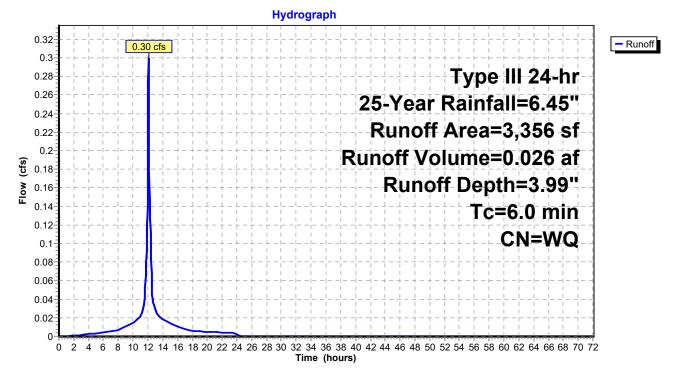
Summary for Subcatchment SC-1: Overland to West Wetland

Runoff = 0.30 cfs @ 12.09 hrs, Volume= Routed to Pond P-1 : Forebay 0.026 af, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 25-Year Rainfall=6.45"

A	rea (sf)	CN	Description				
	532	98	Paved park	ing, HSG A	A		
	1,256	39	Pasture/gra	ssland/rang	ge, Good, HSG A		
	1,568	96	Gravel surfa	Gravel surface, HSG A			
	3,356		Weighted A	verage			
	2,824	71	84.15% Pe	vious Area	1		
	532	98	15.85% Impervious Area				
Tc (min)	Length (feet)	Slop (ft/f	,	Capacity (cfs)	Description		
6.0					Direct Entry, Tc Min		

Subcatchment SC-1: Overland to West Wetland



Summary for Subcatchment SC-2: Overland to Forebay

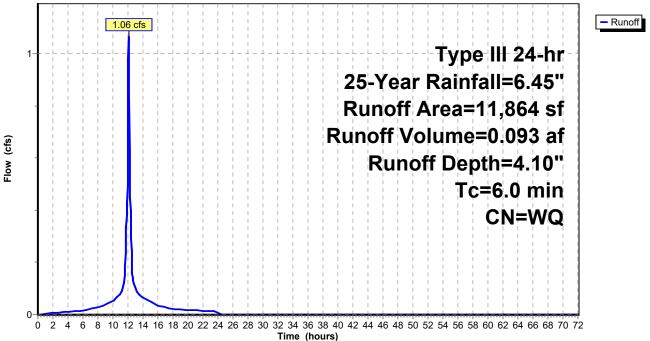
Runoff = 1.06 cfs @ 12.09 hrs, Volume= Routed to Pond P-1 : Forebay 0.093 af, Depth= 4.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 25-Year Rainfall=6.45"

A	rea (sf)	CN	Description			
	7,418	98	Paved park	ing, HSG A	N	
	4,446	39	Pasture/gra	ssland/rang	ge, Good, HSG A	
	11,864		Weighted A	verage		
	4,446	39	37.47% Pei	rvious Area		
	7,418	98	62.53% Impervious Area			
Tc (min)	Length (feet)	Slop (ft/f	,	Capacity (cfs)	Description	
6.0					Direct Entry, Tc Min	

Subcatchment SC-2: Overland to Forebay

Hydrograph



Summary for Subcatchment SC-3: Overland to Basin

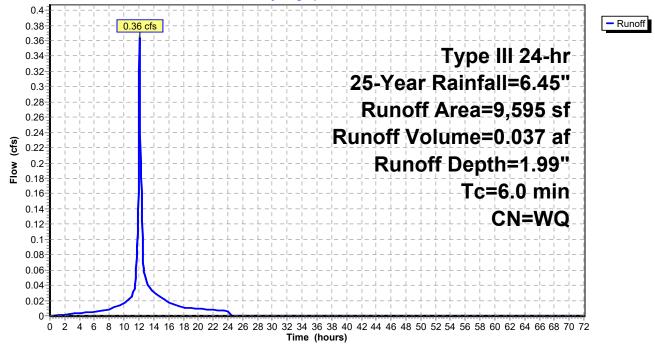
Runoff = 0.36 cfs @ 12.10 hrs, Volume= 0.037 af, Depth= 1.99" Routed to Pond P-2 : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 25-Year Rainfall=6.45"

A	rea (sf)	CN	Description				
	2,407	98	Water Surfa	ace, 0% imp	p, HSG A		
	7,188	39	Pasture/grassland/range, Good, HSG A				
	9,595		Weighted A	verage			
	9,595	54	100.00% P	ervious Are	a		
_				.			
Тс	Length	Slop	,	Capacity	Description		
(min)	(feet)	(ft/f	t) (ft/sec)	(cfs)			
6.0					Direct Entry, Tc Min		

Subcatchment SC-3: Overland to Basin

Hydrograph



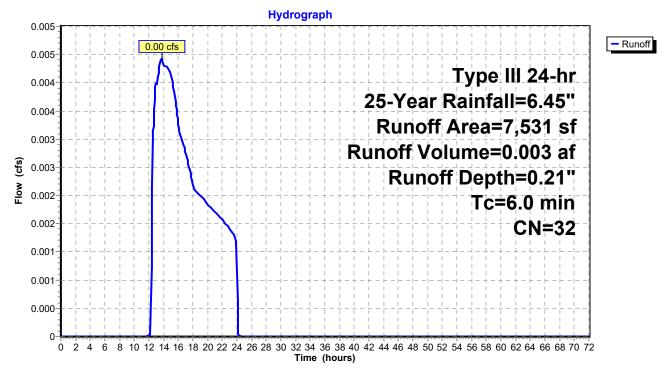
Summary for Subcatchment SC-4: Basin Berm and Shoulder

Runoff = 0.00 cfs @ 13.72 hrs, Volume= Routed to Link DP-2 : East Low Point 0.003 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 25-Year Rainfall=6.45"

A	rea (sf)	CN	Description					
	7,531	32	Woods/grass comb., Good, HSG A					
	7,531	32	100.00% Pe	ervious Are	ea			
Tc (min)	Length (feet)	Slope (ft/ft		Capacity (cfs)	Description			
6.0					Direct Entry, Tc Min			

Subcatchment SC-4: Basin Berm and Shoulder



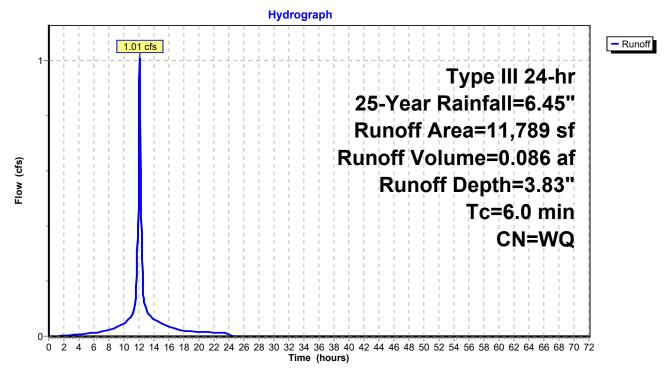
Summary for Subcatchment SC-5: Overland to West Wetland

Runoff = 1.01 cfs @ 12.09 hrs, Volume= Routed to Link DP-1 : West Wetlands 0.086 af, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 25-Year Rainfall=6.45"

/	Area (sf)	CN	Description						
*	540	98	Impervious	HSG A					
	4,724	39	Pasture/gra	ssland/rang	ge, Good, HSG A				
	6,525	96	Gravel surfa	Gravel surface, HSG A					
	11,789		Weighted A	verage					
	11,249	72	95.42% Pe	vious Area	l				
	540	98	4.58% Impe	4.58% Impervious Area					
Tc (min)	5	Slop (ft/f		Capacity (cfs)	Description				
6.0					Direct Entry, Tc Min				

Subcatchment SC-5: Overland to West Wetland

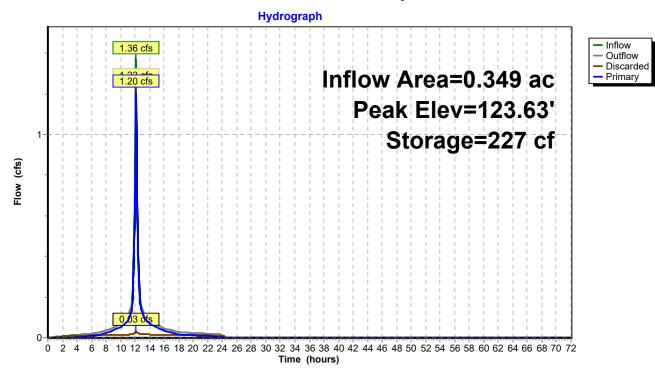


Summary for Pond P-1: Forebay

$\begin{array}{rrr} \text{Inflow} &= & 1.\\ \text{Outflow} &= & 1.\\ \text{Discarded} &= & 0. \end{array}$.36 cfs @ 12.0 .23 cfs @ 12.1 .03 cfs @ 12.1 .20 cfs @ 12.1	9 hrs, Volume= 3 hrs, Volume= 3 hrs, Volume= 3 hrs, Volume=	0.119 af 0.119 af 0.023 af	, Atten= 10%, Lag= 2.4 min				
Routing by Dyn-Stor-								
Peak Elev= 123.63' @	@ 12.13 hrs Su	ırf.Area= 553 sf	Storage= 227 c	f				
0	Plug-Flow detention time= 5.4 min calculated for 0.119 af (100% of inflow) Center-of-Mass det. time= 5.5 min(762.2 - 756.7)							
Volume Invert	Avail.Storag	je Storage De	scription					
#1 123.00'	472 (cf Custom St	age Data (Prism	atic)Listed below (Recalc)				
Elevation Su	ırf.Area	Inc.Store	Cum.Store					
(feet)	(sq-ft) (cu	ubic-feet)	(cubic-feet)					
123.00	165	0	0					
124.00	779	472	472					
Device Routing Invert Outlet Devices								
#1 Primary 123.00' 12.0" Round Culvert								
				n to fill, Ke= 0.700				
				50' S= 0.0072 '/' Cc= 0.900				
#2 Discarded			ated PE, smooth tration over Surf	interior, Flow Area= 0.79 sf				
	120.00 2							
Discarded OutFlow Max=0.03 cfs @ 12.13 hrs HW=123.62' (Free Discharge)								

Discarded OutFlow Max=0.03 cfs @ 12.13 hrs HW=123.62' (Free Discharge) **2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=1.17 cfs @ 12.13 hrs HW=123.62' TW=122.51' (Dynamic Tailwater) **1=Culvert** (Barrel Controls 1.17 cfs @ 3.25 fps) Pond P-1: Forebay

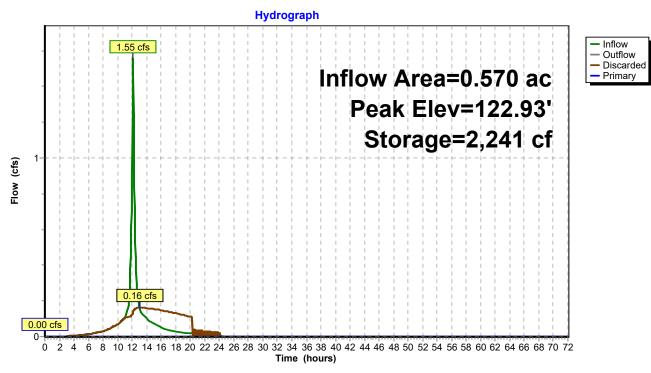


Summary for Pond P-2: Infiltration Basin

Inflow Area = 0.570 ac, 32.04% Impervious, Inflow Depth = 2.78" for 25-Year event Inflow = 1.55 cfs @ 12.12 hrs, Volume= 0.132 af Outflow = 0.16 cfs @ 13.02 hrs, Volume= 0.132 af, Atten= 90%, Lag= 54.2 min Discarded = 0.16 cfs @ 13.02 hrs, Volume= 0.132 af Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af Routed to Link DP-2 : East Low Point 0.000 af							
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Peak Elev= 122.93' @ 13.02 hrs Surf.Area= 2,893 sf Storage= 2,241 cf							
			culated: outflow nin (882.8 - 765		flow)		
Volume	Invert	Avail.Stor	rage Storage [Description			
#1	122.00'	5,93	87 cf Custom	Stage Data	(Prismat	ic) Listed below (Recalc)	
Elevatior (feet 122.00	:) (se 0 1,	q-ft) ,944	Inc.Store (cubic-feet) 0	Cum.Stor (cubic-feet	re t <u>)</u> 0		
124.00	124.00 3,993 5,937 5,937						
Device Routing Invert Outlet Devices							
Discarded OutFlow Max=0.16 cfs @ 13.02 hrs HW=122.93' (Free Discharge) 2=Exfiltration (Exfiltration Controls 0.16 cfs)							

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=122.00' TW=0.00' (Dynamic Tailwater) **1=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond P-2: Infiltration Basin

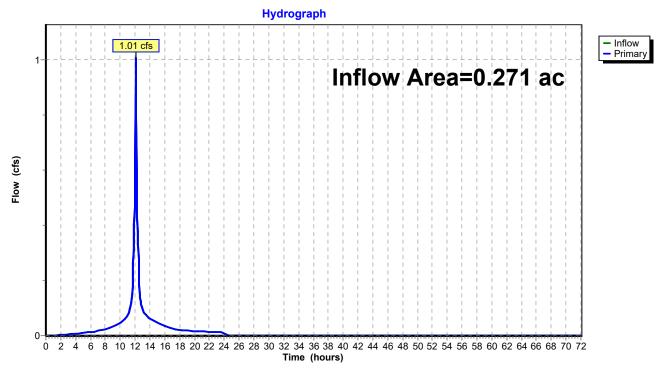


Summary for Link DP-1: West Wetlands

Inflow Area	a =	0.271 ac,	4.58% Impervious,	Inflow Depth = 3.83	for 25-Year event
Inflow	=	1.01 cfs @	12.09 hrs, Volume	= 0.086 af	
Primary	=	1.01 cfs @	12.09 hrs, Volume	e= 0.086 af, A	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

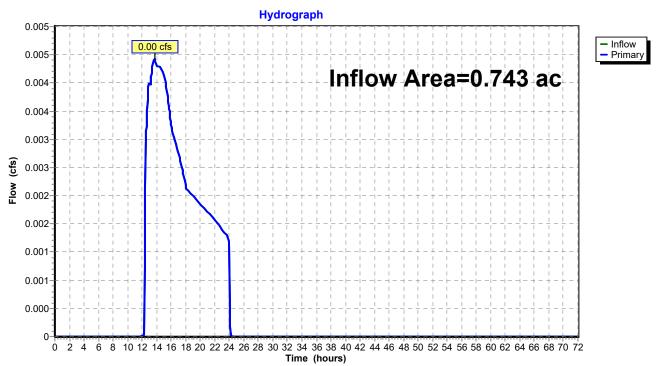
Link DP-1: West Wetlands



Summary for Link DP-2: East Low Point

Inflow Area =	=	0.743 ac, 24.58% Impervious, Inflow Depth = 0.05" for 25-Year	event
Inflow =	=	0.00 cfs @ 13.72 hrs, Volume= 0.003 af	
Primary =	•	0.00 cfs @ 13.72 hrs, Volume= 0.003 af, Atten= 0%, Lag=	: 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Link DP-2: East Low Point

Millis Well 3 Proposed Prepared by Kleinfelder HydroCAD® 10.20-2f s/n 00759 © 2022 Hydro		100-Year Rainfall=8.27" Printed 1/11/2024 Page 64
Runoff by SCS TF	-72.00 hrs, dt=0.05 hrs, 1441 points R-20 method, UH=SCS, Weighted-Q I method - Pond routing by Dyn-Sto	
SubcatchmentSC-1: Overland to West	Runoff Area=3,356 sf 15.85% Impe Tc=6.0 min CN=WQ	rvious Runoff Depth=5.39" Runoff=0.41 cfs 0.035 af
SubcatchmentSC-2: Overland to Forebay		rvious Runoff Depth=5.50" Runoff=1.45 cfs 0.125 af
SubcatchmentSC-3: Overland to Basin	Runoff Area=9,595 sf 0.00% Impe Tc=6.0 min CN=WQ	rvious Runoff Depth=2.97" Runoff=0.60 cfs 0.054 af
SubcatchmentSC-4: Basin Berm and	Runoff Area=7,531 sf 0.00% Impe Tc=6.0 min CN=32	rvious Runoff Depth=0.64" ? Runoff=0.05 cfs 0.009 af
SubcatchmentSC-5: Overland to West	Runoff Area=11,789 sf 4.58% Impe Tc=6.0 min CN=WQ	rvious Runoff Depth=5.19" Runoff=1.38 cfs 0.117 af
Pond P-1: Forebay Discarded=0.04 cfs	Peak Elev=123.76' Storage=304 o s 0.027 af Primary=1.62 cfs 0.133 af	
Pond P-2: Infiltration Basin Discarded=0.18 cfs	Peak Elev=123.31' Storage=3,415 o s 0.187 af Primary=0.00 cfs 0.000 af	
Link DP-1: West Wetlands		Inflow=1.38 cfs 0.117 af Primary=1.38 cfs 0.117 af
Link DP-2: East Low Point		Inflow=0.05 cfs 0.009 af Primary=0.05 cfs 0.009 af

Total Runoff Area = 1.013 acRunoff Volume = 0.340 afAverage Runoff Depth = 4.03"80.76% Pervious = 0.818 ac19.24% Impervious = 0.195 ac

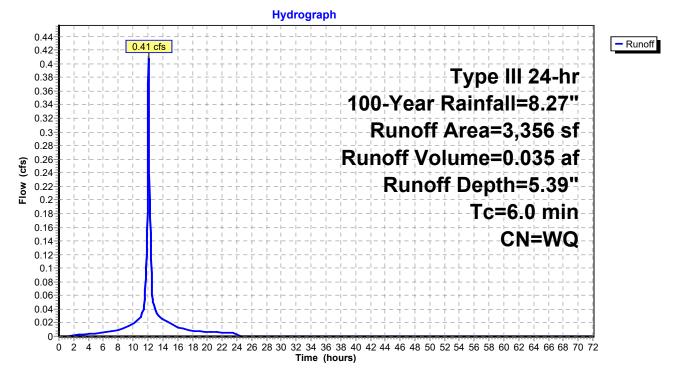
Summary for Subcatchment SC-1: Overland to West Wetland

Runoff = 0.41 cfs @ 12.09 hrs, Volume= Routed to Pond P-1 : Forebay 0.035 af, Depth= 5.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 100-Year Rainfall=8.27"

A	rea (sf)	CN	Description		
	532	98	Paved park	ing, HSG A	N
	1,256	39	Pasture/gra	ssland/rang	ge, Good, HSG A
	1,568	96	Gravel surfa	ace, HSG A	Â
	3,356		Weighted A	verage	
	2,824	71	84.15% Per	vious Area	
	532	98	15.85% Imp	pervious Are	ea
Tc (min)	Length (feet)	Slop (ft/f	•	Capacity (cfs)	Description
6.0			, , , ,		Direct Entry, Tc Min

Subcatchment SC-1: Overland to West Wetland



Summary for Subcatchment SC-2: Overland to Forebay

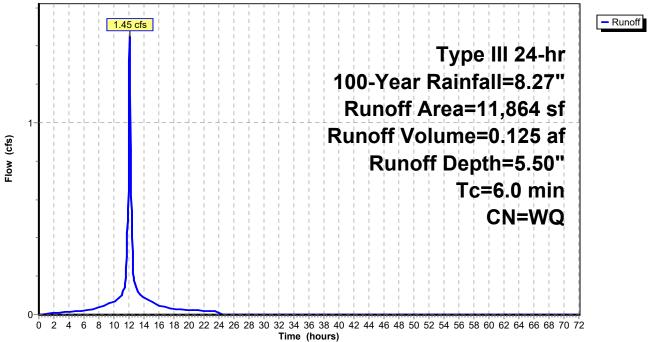
Runoff = 1.45 cfs @ 12.09 hrs, Volume= Routed to Pond P-1 : Forebay 0.125 af, Depth= 5.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 100-Year Rainfall=8.27"

A	rea (sf)	CN	Description		
	7,418	98	Paved park	ing, HSG A	N Contraction of the second
	4,446	39	Pasture/gra	ssland/rang	ge, Good, HSG A
	11,864		Weighted A	verage	
	4,446	39	37.47% Pe	rvious Area	
	7,418	98	62.53% Imp	pervious Ar	ea
Tc (min)	Length (feet)	Slop (ft/f	,	Capacity (cfs)	Description
6.0					Direct Entry, Tc Min

Subcatchment SC-2: Overland to Forebay

Hydrograph



Summary for Subcatchment SC-3: Overland to Basin

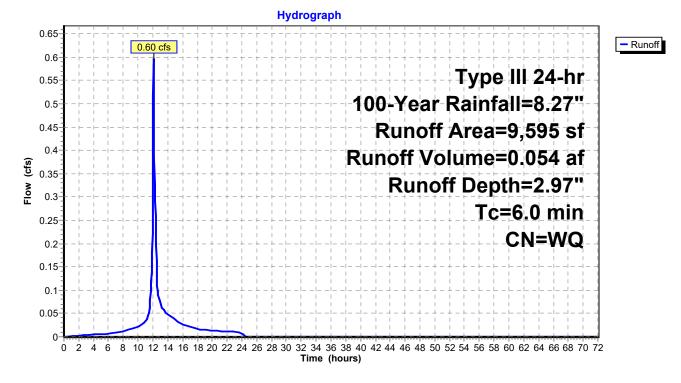
Runoff = 0.60 cfs @ 12.10 hrs, Volume= 0. Routed to Pond P-2 : Infiltration Basin

0.054 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 100-Year Rainfall=8.27"

A	rea (sf)	CN	Description		
	2,407	98	Water Surfa	ace, 0% imp	p, HSG A
	7,188	39	Pasture/gra	ssland/ran	ge, Good, HSG A
	9,595		Weighted A	verage	
	9,595	54	100.00% P	ervious Are	a
_				.	
Тс	Length	Slop	,	Capacity	Description
(min)	(feet)	(ft/f	t) (ft/sec)	(cfs)	
6.0					Direct Entry, Tc Min

Subcatchment SC-3: Overland to Basin



Summary for Subcatchment SC-4: Basin Berm and Shoulder

Runoff = 0.05 cfs @ 12.34 hrs, Volume= Routed to Link DP-2 : East Low Point 0.009 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 100-Year Rainfall=8.27"

A	rea (sf)	CN	Description			
	7,531	32	Woods/gras	ss comb., G	Good, HSG A	
	7,531	32	100.00% P	ervious Are	ea	
Tc (min)	Length (feet)	Slope (ft/ft)		Capacity (cfs)	Description	
6.0					Direct Entry, Tc Min	

Subcatchment SC-4: Basin Berm and Shoulder

Hydrograph 0.05 0.048 - Runoff 0.05 cfs 0.046 0.044 Type III 24-hr 0.042 0.04 100-Year Rainfall=8.27" 0.038-0.036 Runoff Area=7,531 sf 0.034 0.032 Runoff Volume=0.009 af 0.03 (cfs) 0.028 Runoff Depth=0.64" 0.026 Flow 0.024 Tc=6.0 min 0.022 0.02 CN=32 0.018 0.016 0.014 0.012 0.01 0.008 0.006 0.004 0.002 0 Ò 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 Time (hours)

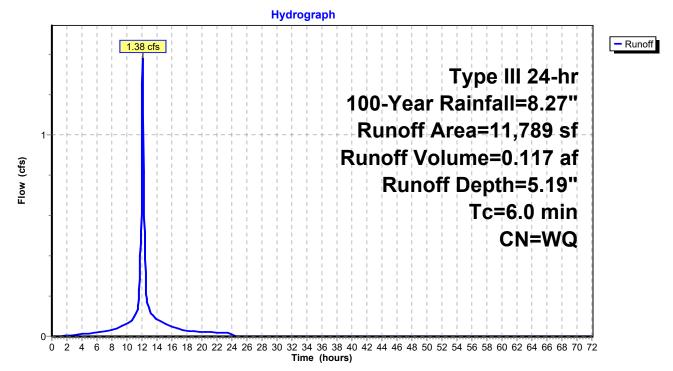
Summary for Subcatchment SC-5: Overland to West Wetland

Runoff = 1.38 cfs @ 12.09 hrs, Volume= Routed to Link DP-1 : West Wetlands 0.117 af, Depth= 5.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs Type III 24-hr 100-Year Rainfall=8.27"

A	Area (sf)	CN	Description		
*	540	98	Impervious,	HSG A	
	4,724	39	Pasture/gra	ssland/rang	ge, Good, HSG A
	6,525	96	Gravel surfa	ace, HSG A	A
	11,789		Weighted A	verage	
	11,249	72	95.42% Pe	vious Area	a de la constante de
	540	98	4.58% Impe	ervious Area	a
Tc (min)	5	Slop (ft/f	,	Capacity (cfs)	Description
6.0					Direct Entry, Tc Min

Subcatchment SC-5: Overland to West Wetland



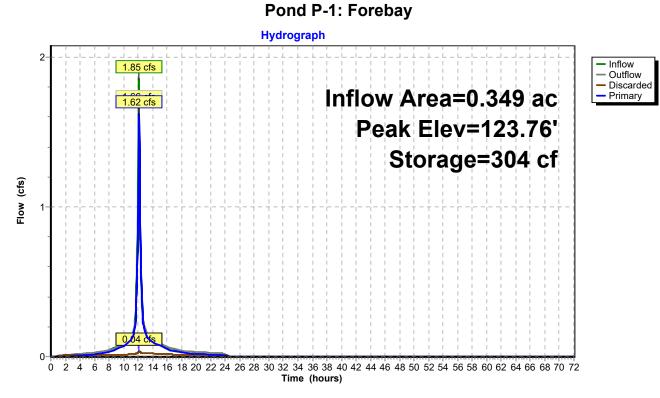
Summary for Pond P-1: Forebay

Inflow = 1.85 cfs @ 1	23% Impervious, Inflow Depth = 5.47" for 100-Year event 2.09 hrs, Volume= 0.159 af 2.12 hrs, Volume= 0.159 of Atten= 11% Log= 2.5 min					
	2.13 hrs, Volume= 0.159 af, Atten= 11%, Lag= 2.5 min 2.13 hrs, Volume= 0.027 af					
	2.13 hrs, Volume= 0.133 af					
Routed to Pond P-2 : Infiltratio	n Basin					
Routing by Dyn-Stor-Ind method	Time Span= 0.00-72.00 hrs, dt= 0.05 hrs					
	Surf.Area= 633 sf Storage= 304 cf					
C	C C					
	n calculated for 0.159 af (100% of inflow)					
Center-of-Mass det. time= 6.6 mir	1 (763.5 - 757.0)					
Volume Invert Avail.Sto	rage Storage Description					
#1 123.00' 4	72 cf Custom Stage Data (Prismatic)Listed below (Recalc)					
Elevation Surf.Area	Inc.Store Cum.Store					
(feet) (sq-ft)	(cubic-feet) (cubic-feet)					
123.00 165						
124.00 779	472 472					
Device Routing Invert						
#1 Primary 123.00'						
	L= 69.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 123.00' / 122.50' S= 0.0072 '/' Cc= 0.900					
	n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf					
#2 Discarded 123.00'						
Discarded OutFlow Max=0.03 cfs @ 12.13 hrs HW=123.75' (Free Discharge)						

2=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=1.59 cfs @ 12.13 hrs HW=123.75' TW=122.74' (Dynamic Tailwater) ☐ 1=Culvert (Barrel Controls 1.59 cfs @ 3.48 fps) HydroCAD® 10.20-2f s/n 00759 © 2022 HydroCAD Software Solutions LLC

1. Earabay



Summary for Pond P-2: Infiltration Basin

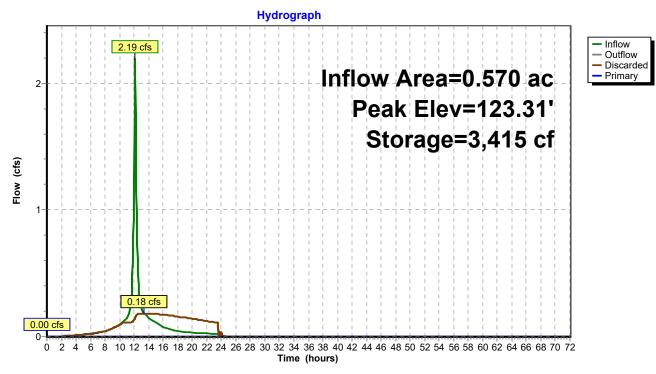
Inflow Outflow Discardeo Primary	= 2.19 c = 0.18 c d = 0.18 c	zfs @ 12.12 zfs @ 13.37 zfs @ 13.37 zfs @ 0.00	hrs, Volume hrs, Volume hrs, Volume hrs, Volume	= 0.187 = 0.187 = 0.187 = 0.187	af, Atten= 92%, Lag= 75.3 af		
	by Dyn-Stor-Ind						
Peak Elev	v= 123.31' @ 13	3.37 hrs Sur	f.Area= 3,283	sf Storage= 3	,415 cf		
	Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 171.8 min (942.3 - 770.5)						
Volume	Invert /	Avail.Storage	Storage De	scription			
#1	122.00'	5,937 ct	Custom St	age Data (Pris	matic)Listed below (Recalc)	
Elevatior	n Surf.Ar	rea Ir	nc.Store	Cum.Store			
Elevatior (feet			nc.Store pic-feet)	Cum.Store (cubic-feet)			
(feet 122.00) (sq D 1,9	- <u>ft) (cul</u> 44	oic-feet) 0	(cubic-feet) 0			
(feet) (sq D 1,9	- <u>ft) (cul</u> 44	pic-feet)	(cubic-feet)			
(feet) 122.00 124.00) (sq D 1,9	<u>-ft) (cul</u> 44 93	oic-feet) 0	(cubic-feet) 0			
(feet 122.00 124.00 <u>Device</u> #1) (sq D 1,9 D 3,9	-ft) (cul 44 93 <u>Invert Ou</u> 123.50' 9.0	oic-feet) 0 5,937 Itlet Devices V long Sharp	<u>(cubic-feet)</u> 0 5,937	Ingular Weir 2 End Contrac urface area	ction(s)	

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=122.00' TW=0.00' (Dynamic Tailwater) **1=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)

Millis Well 3 Proposed Prepared by Kleinfelder

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Pond P-2: Infiltration Basin

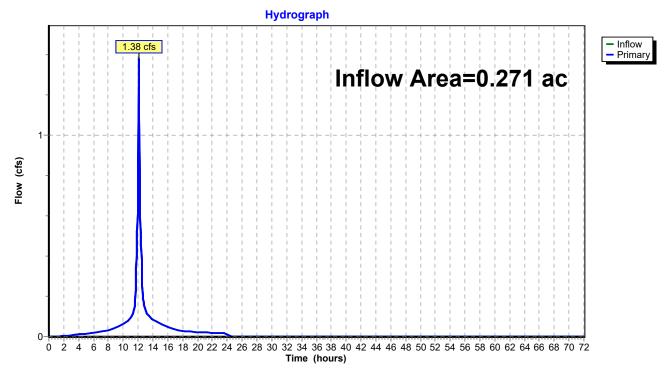


Summary for Link DP-1: West Wetlands

Inflow Area =	0.271 ac,	4.58% Impervious, Inf	low Depth = 5.19"	for 100-Year event
Inflow =	1.38 cfs @	12.09 hrs, Volume=	0.117 af	
Primary =	1.38 cfs @	12.09 hrs, Volume=	0.117 af, Atte	en= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: West Wetlands

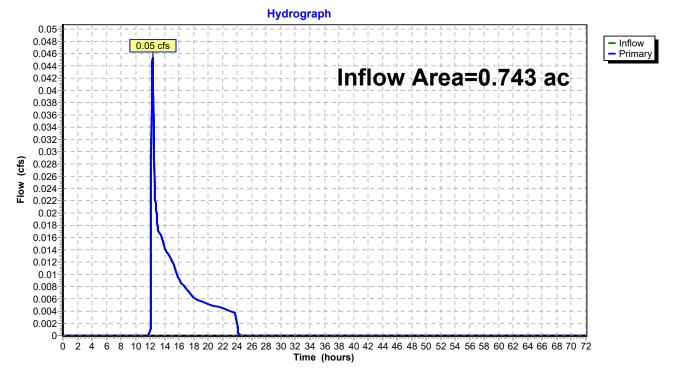


Summary for Link DP-2: East Low Point

Inflow Area	a =	0.743 ac, 24.58% Impervious, Inflow Depth = 0.15" for 100-Year even	nt
Inflow	=	0.05 cfs @ 12.34 hrs, Volume= 0.009 af	
Primary	=	0.05 cfs $ ilde{@}$ 12.34 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 n	nin

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: East Low Point





Appendix D Stormwater Operation and Maintenance Plan

STORMWATER OPERATION AND MAINTANENCE PLAN (O&M)

Owner/	
Operator:	Town of Millis Public Works/ Highway Department 900 Main Street, Room 204 Millis, MA 02054
Prepared by:	Kleinfelder 1 Beacon Street, Suite 8100 Boston, MA 02118

The following operation and maintenance practices will be performed on the proposed stormwater system by the Owner (Town of Millis).

Item	Frequency	What to do
<i>location on site</i> Infiltration Basin	1st & 2nd Year PostConstructionEvery 6 months, andafter a major stormInspection frequencycan be reduced toannual following 2ndyear post-constructionmonitoring.	Inspections should focus on: Checking the infiltration basin surface for standing water or accumulated sediments. Checking the sedimentation chamber or forebay for sediment accumulation, trash, and debris. Inspect to be certain the sedimentation forebay drains within 24 to 72 hrs.
		Checking inlets, outlets, and overflow spillway for blockage, structural integrity, and evidence of erosion. Removal of decaying vegetation, litter, and debris.
Paved surfaces	Every Six Months or as needed	Sweep and remove sediment from paved wearing surfaces at the site.

Table OM-1 Summary of Stormwater System Operation & Maintenance Tasks Listed By Item

Table OM-1 – Continued

Riprap Apron at Pressure Relief Outlet and Overflow Weir	Every Six Months, and after major storms	Inspect apron for excessive sediment accumulation, eroding slopes, rilling or gullying, repair and clean as necessary.
	Once every 4 years	The apron should be cleaned of vegetation.
Rip rap aprons	Annually, and after major storms	Inspect aprons after major storm events or at a minimum annually. Repair as necessary.
At pipe outlets	Annually	Cleaning and remove debris from apron. Repair as necessary.
Water Conveyance	Semi-annually, and	Inspect swales after major storm event. Clean
Swales	after major storms	debris, and repair as necessary
	Annually	Cleaning and remove debris from swales.
		Repair as necessary.

Table OM-2 Annual Checklist of Stormwater System Operation & Maintenance Tasks Listed By

 Frequency.

Frequency	Item location on site	What to do	Date completed	Notes
Every Six Months	Paved surfaces	Sweep and remove sediment from paved surfaces on a semi- annual basis.		
	Riprap Aprons at Pressure Relief Outlet, Drain Outlet, and Overflow Weir	Inspect riprap aprons and Overflow Weir for excessive sediment accumulation, eroding slopes, rilling or gullying, repair and clean as necessary		
	Water Conveyance Swale	Inspect and remove all accumulated sediment and debris.		

♦♦♦ These inspections should also be performed after all major storms (more than 3.5 inches of rain in a 24-hour period).

Frequency	Item location on site	What to do	Date completed	Notes
Every six months	Infiltration Basin	 Ist & 2nd Year Post Construction Every 6 months, and after a major storm Inspection frequency can be reduced to annual following 1st and 2nd year post- construction monitoring. Remove any accumulated sediment deposits. Use light equipment to remove top layer without compacting underlying area. Mow the area around the detention basin. Remove all clippings after mowing. 		Inspections should focus on: Checking the detention basin surface for standing water and accumulated sediments. Checking the sedimentation chamber or forebay for sediment accumulation, trash, and debris. Inspect to be certain the sedimentation forebay drains within 24 to 72 hrs. Checking inlets, outlets, and overflow spillway for blockage, structural integrity, and evidence of erosion. Removal of decaying vegetation, litter, and debris.

Table OM-2 - Continued

••• These inspections should also be performed after all major storms (more than 3.5 inches of rain in a 24-hour period).

STORMWATER MANAGEMENT LONG TERM POLLUTION PREVENTION PLAN (LTPPP)

Owner/

Operators: Town of Millis Public Works/Highway Department 900 Main Street, Room 204 Millis, MA 02054

Prepared by: Kleinfelder 1 Beacon Street, Suite 8100 Boston, MA 02118

A. MATERIALS MANAGEMENT PRACTICES

The following are the material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff. The Owner and Operator will be responsible for ensuring that these procedures are followed:

1. Good Housekeeping

The following good housekeeping practices will be followed onsite:

- a) An effort will be made to store only enough products required to do the job.
- b) All materials stored onsite will be stored in a neat, orderly manner and, if possible, under a roof or in a containment area. At a minimum, all containers will be stored with their lids on when not in use. Drip pans shall be provided under all dispensers.
- c) Products will be kept in their original containers with the original manufacturer's label in legible condition.
- d) Substances will not be mixed with one another unless recommended by the manufacturer.
- e) Whenever possible, all of a product will be used up before disposing of the container.
- f) Manufacturer's recommendations for proper use and disposal will be followed.
- g) The Operator will be responsible for daily inspections for windblown litter and to ensure proper use and disposal of materials. Collection of all windblown litter will be deposited in an appropriate solid waste container.
- h) The Operator will be responsible for periodic street sweeping on an as need basis for all paved wearing surfaces on site. At a minimum sweeping shall be performed on a quarterly basis.

2. Hazardous Substances

These practices will be used to reduce the risks associated with Hazardous Substances. Material Safety Data Sheets (MSDS's) for each product with hazardous properties that is used at the Site will be obtained and used for the proper management of potential wastes that may result from these products. An MSDS will be posted in the immediate area where such product is stored and/or used and another copy of each MSDS will be maintained in the operations office at the Site. Each employee who must handle a Hazardous Substance will be instructed on the use of MSDS sheets for the product he/she is using, particularly regarding spill control techniques.

- a) Products will be kept in original containers with the original labels in legible condition.
- b) Original labels and MSDS's will be procured and used for each product.
- c) If surplus product must be disposed manufacturer's and local/state/federal required methods for proper disposal must be followed.
- 3. Hazardous Waste

It is imperative that all Hazardous Waste be properly identified and handled in accordance with all applicable Hazardous Waste Standards, including the storage, transport and disposal of the Hazardous Wastes. There are significant penalties for the improper handling of Hazardous Wastes. It is important that the Owner/Operator seeks appropriate assistance in making the determination of whether a substance or material is a Hazardous Waste. For example, Hazardous Waste may include certain Hazardous Substances, as well as pesticides, paints, paint solvents, cleaning solvents, pesticides, contaminated soils, and other materials, substances or chemicals that have been discarded (or are to be discarded) as being out-of-date, contaminated, or otherwise unusable, and can include the containers for those substances; other materials and substances can also be or become Hazardous Wastes, however. The Owner/Operator is also responsible for ensuring that all site personnel are instructed as to these Hazardous Waste requirements and also that the requirements are being followed.

4. Product Specific Practices

The following product specific practices will be followed on the site:

Petroleum Products

All onsite vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Drip pans shall be provided for all dispensers. Any asphalt substances used onsite will be applied according to the manufacturer's recommendations.

Fertilizers

Fertilizers will be applied only in the minimum amounts recommended by the manufacturer. Fertilizer will not be stored on-site on a long-term basis. All temporary storage of fertilizer will be in a covered container. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

Paints, Paint Solvents, and Cleaning Solvents.

All containers will be tightly sealed and stored when not in use. Excess paint and solvents will not be discharged to the storm sewer system but will be properly disposed of according to manufacturer's instructions or federal, state, and local regulations.

5. Solid Wastes

All waste materials will be collected and stored in a covered or enclosed containers and/or securely contained metal dumpsters or compactors. The containers will comply with all local and state solid waste management regulations.

B. SPILL PREVENTION

The Owner will train all personnel in the proper handling and cleanup of spilled Hazardous Substances or Oil. No spilled Hazardous Substances or Oil will be allowed to come in contact with stormwater discharges. If such contact occurs, the storm water discharge will be contained on site until appropriate measures in compliance with state and federal regulations are taken to dispose of such contaminated stormwater. It shall be the responsibility of the Owner to be properly trained, and to train all personnel in spill prevention and clean up procedures.

In order to prevent or minimize the potential for a spill of Hazardous Substances or Oil to come into contact with stormwater, the following steps will be implemented:

- a) All Hazardous Substances or Oil (such as pesticides, petroleum products, fertilizers, detergents, construction chemicals, acids, paints, paint solvents, and cleaning solvents, etc.) will be stored in a secure location, with their lids on, preferably under cover, when not in use.
- b) The minimum practical quantity of all such materials will be kept at the site.
- c) A spill control and containment kit (containing, for example, absorbent materials, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided at the storage site.
- d) Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be trained regarding these procedures and the location of the information and cleanup supplies.
- e) It is the Operators responsibility to ensure that all Hazardous Waste discovered or generated at the site is disposed of properly by a licensed hazardous material disposal company. The Operator is responsible for not exceeding Hazardous Waste storage requirements mandated by the EPA or state and local authority.

C. SNOW MANAGEMENT

Snow management will be performed by the Millis Public Works/Highway Department. Snow will be placed and mounded on the side of River Road, as necessary. Melting snow will be allowed to percolate through the vegetated surface. In the spring, when all the snow has melted, all accumulated sediment, and debris remaining shall be cleaned and removed from the site.



Appendix E Water Quality Calculations

			_			
E	levation	Surface	Storage	Elevation	Surface	Storage
	(feet)	(sq-ft)	(cubic-feet)	(feet)	(sq-ft)	(cubic-feet)
	123.00	165	0	123.52	484	169
	123.01	171	2	123.53	490	174
	123.02	177	3	123.54	497	179
	123.03	183	5	123.55	503	184
	123.04	190	7	123.56	509	189
	123.05	196	9	123.57	515	194
	123.06	202	11	123.58	521	199
	123.07	208	13	123.59	527	204
	123.08	214	15	123.60	533	210
	123.09	220	17	123.61	540	215
	123.10	226	20	123.62	546	220
	123.11	233	22	123.63	552	226
	123.12	239	24	123.64	558	231
	123.13	245	27	123.65	564	237
	123.14	251	29	123.66	570	243
	123.15	257	32	123.67	576	248
	123.16	263	34	123.68	583	254
	123.17	269	37	123.69	589	260
	123.18	276	40	123.70	595	266
	123.19	282	42	123.71	601	272
	123.20	288	45	123.72	607	278
	123.21	294	48	123.73	613	284
	123.22	300	51	123.74	619	290
	123.23	306	54	123.75	626	296
	123.24	312	57	123.76	632	303
	123.25	319	60	123.77	638	309
	123.26	325	64	123.78	644	315
	123.27	331	67	123.79	650	322
	123.28	337	70	123.80	656	328
	123.29	343	74	123.81	662	335
	123.30	349	77	123.82	668	342
	123.31	355	81	123.83	675	348
	123.32	361	84	123.84	681	355
	123.33	368	88	123.85	687	362
	123.34	374	92	123.86	693	369
	123.35	380	95	123.87	699	376
	123.36	386	99	123.88	705	383
	123.37	392	103	123.89	703	390
	123.38	398	107	123.90	718	397
	123.39	404	111	123.91	724	404
	123.40	411	115	123.92	730	412
	123.41	417	119	123.93	736	419
	123.42	423	123	123.94	742	426
	123.43	429	128	123.95	748	434
	123.44	435	132	123.96	754	441
	123.45	441	136	123.97	761	449
	123.46	447	141	123.98	767	457
	123.40	454	145	123.99	707	464
25% WQV	123.47	460	145	123.99	779	404 472
storage	123.48	466	155	124.00	119	412
requirement	123.49	400	159			
of 164 cf is	123.50 123.51	472	159 164			
met.	120.01		104			
				1		

met.

123.02

2,989

Elevation Surface Storage Elevation Surface Storage (feet) <u>(sq-ft)</u> (cubic-feet) (feet) (sq-ft) (cubic-feet) 3,009 122.00 1,944 123.04 2,576 0 122.02 1,964 39 123.06 3,030 2,636 3,050 122.04 1,985 79 123.08 2,697 122.06 2,005 118 123.10 3,071 2,758 122.08 2,026 159 123.12 3,091 2,820 122.10 2,046 200 123.14 3,112 2,882 122.12 2,067 241 123.16 3,132 2,944 122.14 2,087 282 123.18 3,153 3,007 122.16 2,108 324 123.20 3,173 3,070 122.18 2,128 367 123.22 3,194 3,134 122.20 2,149 409 123.24 3,214 3,198 2,169 452 123.26 3,235 122.22 3,263 122.24 2,190 496 123.28 3,255 3,328 122.26 2,210 540 123.30 3,276 3,393 WQV 122.28 2,231 584 123.32 3,296 3,459 storage 629 122.30 2,251 123.34 3,317 3,525 requirement 122.32 675 123.36 3,337 3,591 2,272 of 655 cf is 2,292 720 3,358 122.34 123.38 3,658 122.36 766 123.40 3,378 2,313 3,726 122.38 2,333 813 123.42 3,399 3,793 122.40 860 123.44 3,419 2,354 3,862 122.42 2,374 907 123.46 3,440 3,930 3,460 122.44 2,395 955 123.48 3,999 122.46 2,415 1,003 123.50 3,481 4,069 122.48 2,436 1,051 123.52 3,501 4,138 122.50 2,456 123.54 3,522 1,100 4,209 122.52 2,477 1,149 123.56 3,542 4,279 122.54 2,497 1,199 123.58 3,563 4,350 122.56 123.60 2,518 1,249 3,583 4,422 122.58 123.62 2,538 1,300 3,604 4,494 122.60 2,559 123.64 3,624 1,351 4,566 3,645 123.66 122.62 2,579 1,402 4,639 3,665 122.64 2,600 1,454 123.68 4,712 122.66 2,620 1,506 123.70 3,686 4,785 3,706 122.68 2,641 1,559 123.72 4.859 122.70 2,661 123.74 3,727 4,933 1,612 2,682 1,665 123.76 3,747 122.72 5,008 122.74 2,702 1,719 123.78 3,768 5.083 122.76 2,723 1,773 123.80 3,788 5,159 122.78 2,743 1,828 123.82 3,809 5,235 122.80 3,829 2,764 1,883 123.84 5.311 122.82 2,784 1,939 123.86 3.850 5.388 122.84 1,994 123.88 3,870 2,805 5,465 122.86 2.825 2.051 123.90 3.891 5,543 122.88 2,846 2,107 123.92 3,911 5.621 122.90 2,866 2,165 123.94 3.932 5.699 122.92 2,887 2,222 123.96 3,952 5,778 122.94 2.907 2.280 123.98 3.973 5.857 122.96 2,928 2,338 124.00 3,993 5,937 122.98 2,948 2,397 123.00 2,969 2,456

2,516

Stage-Area-Storage for Pond P-2: Infiltration Basin

INSTRUCTIONS:

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu

2. Select BMP from Drop Down Menu

3. After BMP is selected, TSS Removal and other Columns are automatically completed.

	Location:	Village Street Millis, MA			
	В	С	D	Е	F
		TSS Removal	Starting TSS	Amount	Remaining
	BMP ¹	Rate ¹	Load*	Removed (C*D)	Load (D-E)
neet	Sediment Forebay	0.25	1.00	0.25	0.75
moval Worksheet	Infiltration Basin	0.80	0.75	0.60	0.15
() _ ()		0.00	0.15	0.00	0.15
TSS Ro Calculation		0.00	0.15	0.00	0.15
Cal		0.00	0.15	0.00	0.15
		Total T	SS Removal =	85%	Separate Form Needs to be Completed for Each Outlet or BMP Train
	Proiect:	Millis Well 3 PFAS Treatment Facility			
	Prepared By:			*Equals remaining load fror	n previous BMP (E)
Non-automate	d TSS Calculation Sheet	10/25/2023		which enters the BMP	
	if Proprietary BMP Proposed			110	as Dant of Environmental Drotaction

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1. From MassDEP Stormwater Handbook Vol. 1

Mass. Dept. of Environmental Protection



Appendix F Project Data: NOAA Rainfall and NRCS Web Soil Survey



NOAA Atlas 14, Volume 10, Version 3 Location name: Millis, Massachusetts, USA* Latitude: 42.1662°, Longitude: -71.3406° Elevation: 122 ft** * source: ESRI Maps ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration				Average	recurrence	interval (y	ears)			
Duration	1	2	5	10	25	50	100	200	500	1000
5-min	0.323 (0.250-0.413)	0.392 (0.303-0.502)	0.505 (0.389-0.649)	0.599 (0.459-0.774)	0.728 (0.541-0.987)	0.825 (0.601-1.14)	0.927 (0.658-1.34)	1.04 (0.701-1.54)	1.21 (0.786-1.86)	1.36 (0.858-2.12)
10-min	0.458 (0.354-0.585)	0.556 (0.429-0.712)	0.716 (0.551-0.920)	0.849 (0.650-1.10)	1.03 (0.767-1.40)	1.17 (0.852-1.62)	1.31 (0.932-1.90)	1.48 (0.993-2.18)	1.72 (1.11-2.63)	1.92 (1.22-3.00)
15-min	0.539 (0.417-0.689)	0.654 (0.505-0.837)	0.842 (0.649-1.08)	0.999 (0.765-1.29)	1.21 (0.902-1.65)	1.38 (1.00-1.91)	1.54 (1.10-2.23)	1.74 (1.17-2.57)	2.02 (1.31-3.10)	2.26 (1.43-3.53)
30-min	0.738 (0.571-0.944)	0.898 (0.694-1.15)	1.16 (0.892-1.49)	1.38 (1.06-1.78)	1.67 (1.24-2.27)	1.90 (1.38-2.63)	2.13 (1.51-3.08)	2.40 (1.61-3.55)	2.80 (1.81-4.28)	3.12 (1.98-4.88)
60-min	0.937 (0.725-1.20)	1.14 (0.882-1.46)	1.48 (1.14-1.90)	1.75 (1.34-2.27)	2.13 (1.59-2.89)	2.42 (1.76-3.36)	2.72 (1.93-3.93)	3.07 (2.06-4.53)	3.57 (2.31-5.47)	3.98 (2.52-6.23)
2-hr	1.20 (0.931-1.52)	1.47 (1.14-1.87)	1.92 (1.49-2.46)	2.30 (1.77-2.96)	2.82 (2.11-3.81)	3.20 (2.35-4.43)	3.61 (2.59-5.23)	4.11 (2.77-6.03)	4.86 (3.16-7.40)	5.51 (3.50-8.55)
3-hr	1.38 (1.08-1.75)	1.71 (1.33-2.16)	2.24 (1.74-2.85)	2.68 (2.07-3.42)	3.28 (2.47-4.43)	3.73 (2.75-5.16)	4.22 (3.04-6.09)	4.81 (3.25-7.03)	5.73 (3.72-8.67)	6.52 (4.14-10.1)
6-hr	1.79 (1.40-2.25)	2.20 (1.72-2.77)	2.87 (2.24-3.62)	3.43 (2.66-4.35)	4.19 (3.17-5.62)	4.76 (3.53-6.54)	5.38 (3.90-7.72)	6.14 (4.16-8.90)	7.31 (4.77-11.0)	8.33 (5.31-12.8)
12-hr	2.29 (1.81-2.86)	2.79 (2.20-3.49)	3.62 (2.85-4.54)	4.30 (3.37-5.43)	5.25 (3.99-6.97)	5.94 (4.43-8.09)	6.70 (4.88-9.53)	7.62 (5.19-11.0)	9.04 (5.92-13.5)	10.3 (6.56-15.6)
24-hr	2.76 (2.19-3.42)	3.39 (2.69-4.20)	4.42 (3.50-5.51)	5.28 (4.15-6.61)	6.45 (4.93-8.52)	7.32 (5.49-9.91)	8.27 (6.06-11.7)	9.44 (6.45-13.5)	11.3 (7.39-16.6)	12.8 (8.23-19.3)
2-day	3.13 (2.50-3.85)	3.91 (3.13-4.82)	5.20 (4.14-6.43)	6.26 (4.96-7.80)	7.73 (5.95-10.2)	8.80 (6.66-11.9)	9.99 (7.39-14.1)	11.5 (7.88-16.3)	13.9 (9.17-20.4)	16.1 (10.3-24.0)
3-day	3.41 (2.74-4.19)	4.26 (3.42-5.23)	5.64 (4.51-6.96)	6.79 (5.40-8.42)	8.38 (6.47-11.0)	9.53 (7.23-12.8)	10.8 (8.03-15.2)	12.5 (8.55-17.6)	15.1 (9.96-22.1)	17.4 (11.2-25.9)
4-day	3.68 (2.96-4.50)	4.56 (3.66-5.58)	5.99 (4.80-7.36)	7.18 (5.72-8.87)	8.82 (6.82-11.5)	10.0 (7.61-13.4)	11.3 (8.43-15.9)	13.0 (8.97-18.3)	15.8 (10.4-22.9)	18.2 (11.7-26.9)
7-day	4.43 (3.58-5.39)	5.35 (4.32-6.52)	6.86 (5.52-8.38)	8.10 (6.48-9.96)	9.82 (7.62-12.7)	11.1 (8.44-14.7)	12.5 (9.26-17.3)	14.2 (9.81-19.8)	17.0 (11.2-24.5)	19.3 (12.5-28.5)
10-day	5.14 (4.17-6.23)	6.09 (4.93-7.39)	7.63 (6.16-9.30)	8.92 (7.16-10.9)	10.7 (8.31-13.7)	12.0 (9.14-15.8)	13.4 (9.94-18.4)	15.1 (10.5-21.0)	17.8 (11.8-25.6)	20.1 (13.1-29.5)
20-day	7.23 (5.90-8.71)	8.25 (6.72-9.94)	9.91 (8.05-12.0)	11.3 (9.11-13.7)	13.2 (10.3-16.7)	14.6 (11.1-18.9)	16.1 (11.9-21.6)	17.8 (12.4-24.5)	20.2 (13.5-28.7)	22.1 (14.4-32.2)
30-day	8.96 (7.34-10.7)	10.0 (8.21-12.0)	11.8 (9.59-14.2)	13.2 (10.7-16.0)	15.2 (11.9-19.1)	16.7 (12.7-21.4)	18.3 (13.4-24.2)	19.9 (13.9-27.2)	22.0 (14.8-31.2)	23.7 (15.5-34.3)
45-day	11.1 (9.14-13.3)	12.2 (10.0-14.6)	14.1 (11.5-16.9)	15.6 (12.7-18.8)	17.7 (13.8-22.0)	19.3 (14.7-24.5)	20.9 (15.3-27.3)	22.4 (15.7-30.4)	24.3 (16.3-34.2)	25.7 (16.8-37.0)
60-day	12.9 (10.7-15.4)	14.1 (11.6-16.8)	16.0 (13.1-19.1)	17.5 (14.3-21.1)	19.7 (15.4-24.4)	21.4 (16.3-27.0)	23.0 (16.8-29.8)	24.5 (17.2-33.1)	26.2 (17.6-36.7)	27.3 (17.9-39.2)

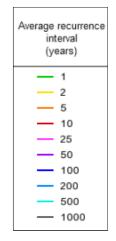
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

25 Precipitation depth (in) 20 15 10 5 0 5-min 10-min 15-min 30-min 60-min 2-hr 3-hr 0-pr Duration 24-hr 7-day 10-day 30-day 45-day 60-day 2-day 3-day 4-day 20-day 25 Precipitation depth (in) 20 15 10 5 0 1 2 5 10 25 50 100 200 500 1000 Average recurrence interval (years)



Dura	ation
5-min	2-day
10-min	— 3-day
15-min	— 4-day
30-min	- 7-day
- 60-min	— 10-day
- 2-hr	— 20-day
— 3-hr	— 30-day
— 6-hr	— 45-day
- 12-hr	- 60-day
— 24-hr	

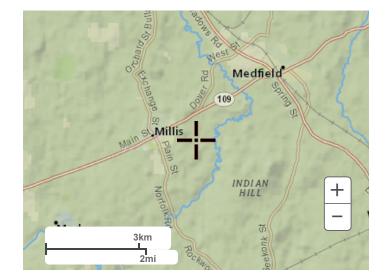
NOAA Atlas 14, Volume 10, Version 3

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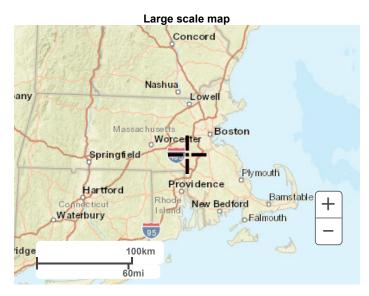
Maps & aerials

Small scale terrain



Large scale terrain





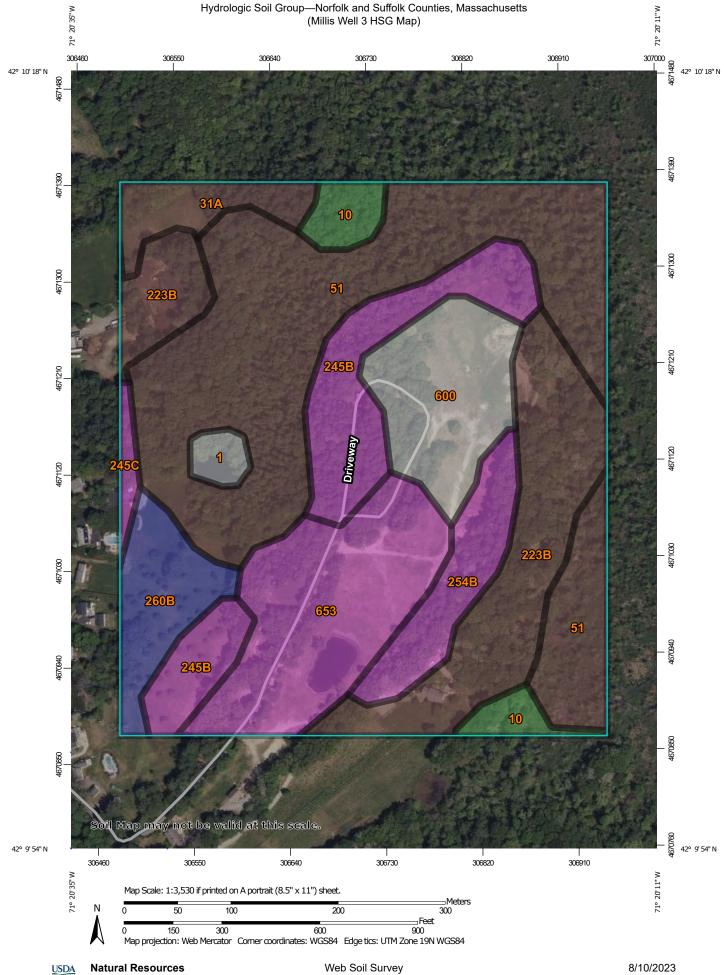
Large scale aerial

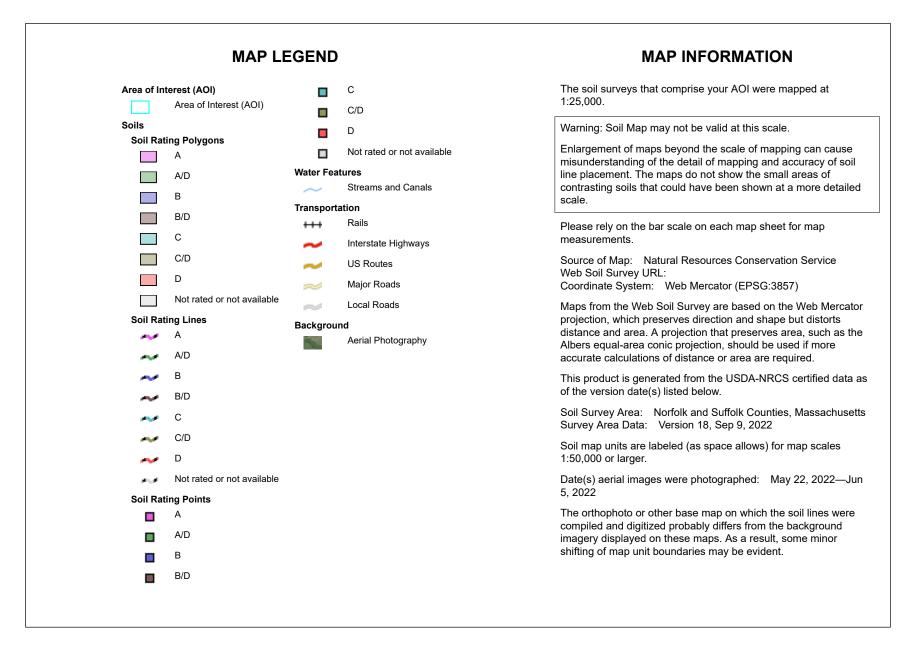


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US Department of Commerce National Oceanic and Atmospheric Administration National Weather Service National Water Center 1325 East West Highway Silver Spring, MD 20910 Questions?: <u>HDSC.Questions@noaa.gov</u>

Disclaimer





Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		0.6	1.1%
10	Scarboro and Birdsall soils, 0 to 3 percent slopes	A/D	1.8	3.0%
31A	Walpole sandy loam, 0 to 3 percent slopes	B/D	2.0	3.4%
51	Swansea muck, 0 to 1 percent slopes	B/D	19.0	32.5%
223B	Scio very fine sandy loam, 2 to 5 percent slopes	B/D	9.3	15.9%
245B	Hinckley loamy sand, 3 to 8 percent slopes	A	6.2	10.6%
245C	Hinckley loamy sand, 8 to 15 percent slopes	A	0.5	0.9%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	A	3.1	5.2%
260B	Sudbury fine sandy loam, 2 to 8 percent slopes	В	3.1	5.3%
600	Pits, sand and gravel		4.9	8.5%
653	Udorthents, sandy	А	8.0	13.7%
Totals for Area of Inter	rest		58.4	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition Component Percent Cutoff: None Specified Tie-break Rule: Higher



Appendix G Boring Logs

DRILLING METHOD/SAMPLER TYPE GRAPHICS	Ľ	JNIF	IED S		SSIFIC	ATIO	N SY	STEM ¹
STANDARD PENETRATION SPLIT SPOON SAMPLER (2 in. (50.8 mm.) outer diameter and 1-3/8 in. (34.9 mm.) inner	Γ			CLEAN		~		WELL-GRADED GRAVEL,
diameter)			(e)	GRAVEL		GV	v	WELL-GRADED GRAVEL WITH SAND
GROUND WATER GRAPHICS			Sieve)	WITH <5%				POORLY GRADED GRAVEL,
$\overline{\underline{\nabla}}$ WATER LEVEL (level where first observed)			No. 4	FINES	0.0	GI		POORLY GRADED GRAVEL WITH SAND
WATER LEVEL (level after stabilizing period)			⊿ uo		Î			WELL-GRADED GRAVEL WITH SILT,
${ar Y}$ WATER LEVEL (additional levels after exploration)			retained			GW-	GM	WELL-GRADED GRAVEL WITH SILT AND SAND
OBSERVED SEEPAGE			retai					WELL-GRADED GRAVEL WITH CLAY (OR SILTY
NOTES			coarse fraction	GRAVELS WITH		GW-	GC	CLAY), WELL-GRADED GRAVEL WITH CLAY AND SAND (OR SILT CLAY AND SAND)
 The report and graphics key are an integral part of these logs. All data and interpretations in this log are subject to the explanations and 	a		frac	5% TO 12%	• YN			
limitations stated in the report.			arse	FINES	β_{-}	GP-0	GM	POORLY GRADED GRAVEL WITH SILT, POORLY GRADED GRAVEL WITH SILT AND SAND
 Solid lines separating strata on the logs represent approximate boundaries only, dashed lines are inferred or extrapolated boundaries. 		_	ď					POORLY GRADED GRAVEL WITH CLAY (OR SILTY
Actual transitions may be gradual or differ from those represented.		ieve	50%		6 B	GP-	GC	CLAY), POORLY GRADED GRAVEL WITH CLAY AND
No warranty is provided as to the continuity of soil or rock conditions		200 Sieve)	an 5					(OR SILTY CLAY AND SAND)
between individual sample locations.			ore th		[0]	GI	N	SILTY GRAVEL, SILTY GRAVEL WITH SAND
• Logs represent general soil or rock conditions observed at the point of exploration on the date indicated.		⊿ uo	GRAVELS (More than	GRAVELS				
• In general, Unified Soil Classification System (ASTM D2488/D2487)		ined	ELS	WITH >		G	c	CLAYEY GRAVEL,
designations presented on the logs were based on visual classification in the field and were modified where appropriate based on gradation and		reta	RAV	12% FINES				CLAYEY GRAVEL WITH SAND
index property testing.		50%	ס			GC-	GM	SILTY, CLAYEY GRAVEL
 Fine grained soils that plot within the hatched area on the Plasticity Chart, and coarse grained soils with between 5% and 12% passing the No 	lo.	han (00-		SILTY, CLAYEY GRAVEL WITH SAND
200 sieve require dual USCS symbols, ie., CL-ML, GW-GM, GP-GM, GW-GC, GP-GC, GC-GM, SW-SM, SP-SM, SW-SC, SP-SC, SC-SM.		GRAINED SOILS (More than 50% retained on No.		~	•••••			WELL-GRADED SAND,
• If sampler is not able to be driven at least 6 inches then 50/X indicates	6	Ň)		CLEAN SANDS WITH <5%		SV	V	WELL-GRADED SAND WITH GRAVEL
number of blows required to drive the identified sampler X inches with a 140 pound hammer falling 30 inches.		OILS	Sieve)					
ABBREVIATIONS		Ñ	Sie	FINES		SF	2	POORLY GRADED SAND, POORLY GRADED SAND WITH GRAVEL
WOH - Weight of Hammer WOR - Weight of Rod		AINE	No. 4	**************************************				
REFERENCES 1. American Society for Materials and Testing (ASTM), 2011, ASTM		GR/	the h			SW-	SM	WELL-GRADED SAND WITH SILT, WELL-GRADED SAND WITH SILT AND GRAVEL
D2487: Classification of Soils for Engineering Purposes (Unified Soil			ses					
Classification System).		COARSE	pas	SANDS		sw-	sc	WELL-GRADED SAND WITH CLAY (OR SILTY CLAY), WELL-GRADED SAND WITH CLAY AND GRAVEL
		с	ction	WITH 5% TO				(OR SILTY CLAY AND GRAVEL)
			e fra	12% FINES		SP-S	SM	POORLY GRADED SAND WITH SILT, POORLY GRADED SAND WITH SILT AND GRAVEL
			coarse fraction passes					FOORLY GRADED SAND WITH SILT AND GRAVEL
			of c			SP-	sc	POORLY GRADED SAND WITH CLAY, POORLY GRADED SAND WITH CLAY AND GRAVEL
			more					(OR SILTY CLAY AND GRAVEL)
			5			SI	,	SILTY SAND,
			(50%			3	"	SILTY SAND WITH GRAVEL
			DS (SANDS WITH >				CLAYEY SAND,
			SANDS	12% FINES		SC	د	CLAYEY SAND WITH GRAVEL
				1 11120	ŹŃ			SILTY, CLAYEY SAND,
						SC-	SM	SILTY, CLAYEY SAND WITH GRAVEL
	L L		I		<u>к Z ЫШ</u>		ML	SILT, SILT WITH SAND, SILT WITH GRAVEL
		s s	ß	0			CL	LEAN CLAY, LEAN CLAY WITH SAND, LEAN CLAY WITH GRAVEL
		SOI	ieve	SILTS AND (Liquid L	.imit			
		NED Ve D	1 air	less thar	150)			ORGANIC CLAY, ORGANIC CLAY WITH SAND, ORGANIC CLAY WITH GRAVEL,
		FINE GRAINED SOILS	₩¥					ORGANIC SILT, ORGANIC SILT WITH SAND, ORGANIC SILT WITH GRAVEL
		E G	Ne N	SILTS AND		\mathbf{W}	MH	ELASTIC SILT. ELASTIC SILT WITH SAND, ELASTIC SILT WITH GRAVEL
		FIN	ŋ≠	(Liquid L 50 or gre			СН	FAT CLAY, FAT CLAY WITH SAND, FAT CLAY WITH GRAVEL ORGANIC CLAY, ORGANIC CLAY WITH SAND, ORGANIC CLAY WITH GRAVEL,
	Ļ						OH	ORGANIC SILT, ORGANIC SILT WITH SAND, ORGANIC SILT WITH GRAVEL
				ON THIS				DN THE LOG TO DEFINE A GRAPHIC THAT MAY NOT BE
F	PROJE	CT N	10.:					GRAPHICS KEY
	202336	67.00	01A					
		AWN BY:		AD		Well 3 PFAS Piloting and Preliminary Design		
	DRAW	n Di					We	Il 3 PFAS Piloting and Preliminary Design
Pright People Dight Colutions	CHECK		ЗY	MR			We	Il 3 PFAS Piloting and Preliminary Design 25 Birch Street Millis, MA

Cobbles 3 - 12 in. (76.2 - 304.8 mm.) 3 - 12 in. (76.2 - 304.8 mm.) Fist-size Scavel coarse 3/4 -3 in. (19 - 76.2 mm.) 3/4 -3 in. (19 - 76.2 mm.) Thumber Sravel fine #4 - 3/4 in. (#4 - 19 mm.) 0.19 - 0.75 in. (4.8 - 19 mm.) Pea-size Scarse attribute attribute 0.079 - 0.19 in. (2 - 4.9 mm.) Rock set Sand medium #40 - #10 0.017 - 0.079 in. (0.43 - 2 mm.) Sugarse fine #200 - #40 0.0029 - 0.017 in. (0.07 - 0.43 mm.) Flour-size	red to sugar-sized
coarse 3/4 - 3 in. (19 - 76.2 mm.) 3/4 - 3 in. (19 - 76.2 mm.) Fist-size ravel coarse 3/4 - 3 in. (19 - 76.2 mm.) 3/4 - 3 in. (19 - 76.2 mm.) Thumb- fine #4 - 3/4 in. (#4 - 19 mm.) 0.19 - 0.75 in. (4.8 - 19 mm.) Pea-size and medium #40 - #10 0.017 - 0.079 in. (0.43 - 2 mm.) Sugarse	ed to sugar-sized
coarse 3/4 -3 in. (19 - 76.2 mm.) 3/4 -3 in. (19 - 76.2 mm.) Fist-size avel fine #4 - 3/4 in. (#4 - 19 mm.) 0.19 - 0.75 in. (4.8 - 19 mm.) Pea-size coarse #10 - #4 0.079 - 0.19 in. (2 - 4.9 mm.) Rock sa	
coarse 3/4 - 3 in. (19 - 76.2 mm.) 3/4 - 3 in. (19 - 76.2 mm.) Thumb-i fine #4 - 3/4 in. (#4 - 19 mm.) 0.19 - 0.75 in. (4.8 - 19 mm.) Pea-size	zed to rock salt-sized
coarse 3/4 -3 in. (19 - 76.2 mm.) 3/4 -3 in. (19 - 76.2 mm.) Thumber	It-sized to pea-sized
Subbles 3 - 12 in. (76.2 - 304.8 mm.) 3 - 12 in. (76.2 - 304.8 mm.) Fist-size coarse 3/4 -3 in. (19 - 76.2 mm.) 3/4 -3 in. (19 - 76.2 mm.) Thumb-	ed to thumb-sized
	sized to fist-sized
Boulders >12 in. (304.8 mm.) >12 in. (304.8 mm.) Larger th	d to basketball-sized
	nan basketball-sized
DESCRIPTION SIEVE SIZE GRAIN SIZE AF	PROXIMATE SIZE

Wet

SECONDARY CONSTITUENT

	AMOUNT				
Term of Use	Secondary Constituent is Fine Grained	Secondary Constituent is Coarse Grained			
Trace	<5%	<15%			
With	≥5 to <15%	≥15 to <30%			
Modifier	≥15%	≥30%			

DESCRIPTION FIELD TEST DESCRIPTION FIELD TEST Crumbles or breaks with handling or slight finger pressure Absence of moisture, dusty, dry to the touch Dry Weakly Crumbles or breaks with considerable finger Damp but no Moist Moderately visible water pressure Visible free water, usually soil is below water table Will not crumble or break with finger pressure

Strongly

CONSISTENCY - FINE-GRAINED SOIL

	ТСР		HYDROCHLOR	IC ACID	
CONSISTENCY	VALUES	FIELD IDENTIFICATION	DESCRIPTION	FIELD TEST	
Very Soft	0 - 8	Core (height twice diameter) sags under own weight	None	No visible reaction	
Soft	8 - 20	Core can be pinched or imprinted easilty with finger	Weak	Some reaction, with bubbles	
Stiff	20 - 40	Core can be imprinted with considerable pressure	vveaк	forming slowly Violent reaction.	
Very Stiff	40 - 80	Core can be imprinted only slightly with fingers Strong		with bubbles forming	
Hard	80 - 5 in./100	Core cannot be imprinted with fingers but can be penetrated with pencil		immediately	
Very Hard	0 in 5 in. /100	Core cannot be penetrated with pencil			

APPARENT / RELATIVE DENSITY - COARSE-GRAINED SOIL

APPARENT DENSITY	TCP VALUES
Very Loose	0 - 8
Loose	8 - 20
Slightly Compact	20 - 40
Compact	40 - 80
Dense	80 - 5 in. /100
Very Dense	0 in. / 5 in. 100

PLASTICITY

DESCRIPTION	LL	FIELD TEST
Non-plastic	NP	A 1/8-in. (3 mm.) thread cannot be rolled at any water content.
Low (L)	< 30	The thread can barely be rolled and the lump or thread cannot be formed when drier than the plastic limit.
Medium (M)	30 - 50	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump or thread crumbles when drier than the plastic limit.
High (H)	> 50	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump or thread can be formed without crumbling when drier than the plastic limit.

STRUCTURE

DESCRIPTION	CRITERIA
Stratified	Alternating layers of varying material or color with layers at least 1/4-in. thick, note thickness.
Laminated	Alternating layers of varying material or color with the layer less than 1/4-in. thick, note thickness.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensided	Fracture planes appear polished or glossy, sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay; note thickness.

ANGULARITY

DESCRIPTION	CRITERIA
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces.
Subangular	Particles are similar to angular description but have rounded edges.
Subrounded	Particles have nearly plane sides but have well-rounded corners and edges.
Rounded	Particles have smoothly curved sides and no edges.



PROJECT NO .: 20233667.001A DRAWN BY: CHECKED BY

AD

MR

3/17/2023

SOIL DESCRIPTION KEY	
Well 3 PFAS Piloting and Preliminary Design 25 Birch Street Millis, MA	

REACTION WITH

DESCRIPTION	FIELD TEST
None	No visible reaction
Weak	Some reaction, with bubbles forming slowly
Strong	Violent reaction, with bubbles forming immediately

	-	n - E	-		Drilling		any				ng Cor	ntracto	rs				BORING LOG B-W3-10
Logge	-	-	A. Daraja		Drill Cre				isiasze								
Hor\		Datu		-	Drilling Equipment: D-5						Hammer Type - Drop: 14					140 lb. Auto - 30 in.	
Plung			-90 degre	es	Drilling	Metho	od:	Drivea	and Was	h with C	asing						
Weat	her:		Cloudy 40				iam	neter: 4 in.	I.D.	1							
				FIELD E	EXPLORATION	N 	1	1					LA	<u> </u>	TOR)	' RESI	JLTS
Elevation (feet)	Depth (feet)	Graphical Log	Surface Cond	face Elevation (ft.): lition: Bare Earth ar	nd Grass	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
Ū,				logic Description			ŝ			്ഗ് റ്	≥ŏ	ā	å	å	Ĕ	đ٤	Å Å
-125	<u>xxxxx</u>		6" Topsoil Brown, very loose little silt, trace gra			S-1		BC=1 1 1 1	12"								
120		×	Top (A): Brown, fi trace gravel (subs	soil)		S-2A		BC=WOH 1	12"								
	•		Bottom (B): Gray/ SAND, some grav		arse 123.9	S-2B		BC=3 12	8"								
	5-0		Gray/brown, very SAND, some grav	dense, fine to co	arse	S-3		BC=4 20 42 45	17"				77	10			Hard casing penetration fro
-120		· · · · · · · · · · · · · · · · · · ·	Gray/brown, very and GRAVEL, tra		arse SAND	S-4		BC=30 29 32 40	10"								4.5 to 8 ft bgs. 300 lb hammer was introdu to drive casing.
Ā			Brown, dense, fin	e to coarse SAN	D and	S-5		BC=16	12"								
	10-	•••• •••• ••••	GRAVEL, trace si		Dana			17 17 17 22									
-115	 15	· · · · · · · · · · · · · · · · · · ·	Brown, dense, GF SAND, little claye		e to coarse	S-6		BC=15 20 18 18	10"				46	12			
-110	-* -* 20-*	· · · · · · · · · · · · · · · · · · ·	Brown/gray, medi SAND and GRAV		o coarse	S-7		BC=8 9 10 13	8"								
-105		· · · · · · · · · · · · · · · · · · ·	Brown, medium d some gravel, trac			S-8		BC=11 10	4"								
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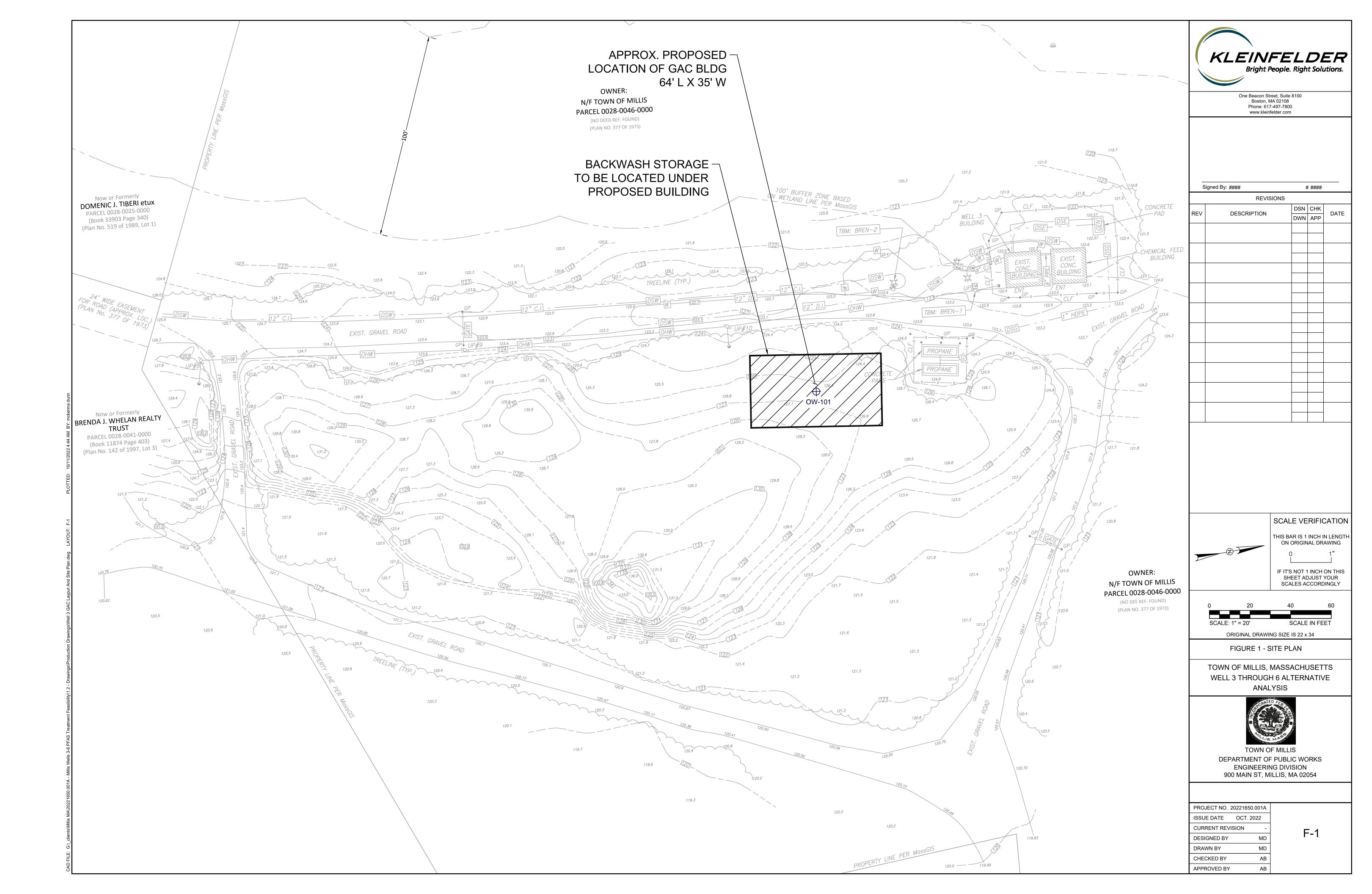
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MPalmer	SAMPLE/SAMPLER TYPE GRAPHICS		UNIF	IED S		SSIFIC	CATIO	N SYS	STEM ¹
В≺.	GEOPROBE SAMPLER			(ə.	CLEAN GRAVEL WITH		GV	v	WELL-GRADED GRAVEL, WELL-GRADED GRAVEL WITH SAND
3 06:10 PM				No. 4 Sieve)	WITH <5% FINES		GI		POORLY GRADED GRAVEL, POORLY GRADED GRAVEL WITH SAND
03/13/2023	ABOVE GROUND WELL CAP SLOTTED SCREEN PIPE - FINE OPENINGS			no		Ĩ	GW-	GM	WELL-GRADED GRAVEL WITH SILT, WELL-GRADED GRAVEL WITH SILT AND SAND
PLOTTED: 0	SOLID WALL PIPE		sve)	coarse fraction retained	GRAVELS WITH		GW-	GC	WELL-GRADED GRAVEL WITH CLAY (OR SILTY CLAY), WELL-GRADED GRAVEL WITH CLAY AND SAND OF SILT CLAY AND SAND
PL	WELL BACKFILL MATERIAL GRAPHICS			arse fract	5% TO 12% FINES		GP-0	ЭМ	SAND (OR SILT CLAY AND SAND) POORLY GRADED GRAVEL WITH SILT, POORLY GRADED GRAVEL WITH SILT AND SAND
	BENTONITE SAND			50% of co		000	GP-0	GC	POORLY GRADED GRAVEL WITH CLAY (OR SILTY CLAY), POORLY GRADED GRAVEL WITH CLAY AND
			COARSE GRAINED SOILS (More than 50% retained on No. 200 Sieve)	than			GI	/	(OR SILTY CLAY AND SAND)
			ied on No	GRAVELS (More	GRAVELS WITH >				SILTY GRAVEL WITH SAND CLAYEY GRAVEL,
	 ✓ WATER LEVEL (level where first observed) ✓ WATER LEVEL (level after stabilizing period) 		% retain	GRAVE	12% FINES		G		CLAYEY GRAVEL WITH SAND
	Y WATER LEVEL (additional levels after exploration) Image: Second sec		than 50				GC-	GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL WITH SAND
	• The report and graphics key are an integral part of these logs. All da and interpretations in this log are subject to the explanations and	ita	LS (More		CLEAN SANDS WITH		sv	v	WELL-GRADED SAND, WELL-GRADED SAND WITH GRAVEL
	 Imitations stated in the report. Solid lines separating strata on the logs represent approximate boundaries only, dashed lines are inferred or extrapolated boundaries. 		IED SOII	4 Sieve)	<5% FINES		SF		POORLY GRADED SAND, POORLY GRADED SAND WITH GRAVEL
	Actual transitions may be gradual or differ from those represented. • No warranty is provided as to the continuity of soil or rock conditions between individual sample locations.		E GRAIN	s the No.			sw-	SM	WELL-GRADED SAND WITH SILT, WELL-GRADED SAND WITH SILT AND GRAVEL
	 Logs represent general soil or rock conditions observed at the point of exploration on the date indicated. 	of	COARS	on passes	SANDS WITH		sw-		WELL-GRADED SAND WITH CLAY (OR SILTY CLAY), WELL-GRADED SAND WITH CLAY AND GRAVEL (OR SILTY CLAY AND GRAVEL)
	 In general, Unified Soil Classification System (ASTM D2488/D2487) designations presented on the logs were based on visual classification the field and were modified where appropriate based on gradation and index property testing. 	in		coarse fraction	5% TO 12% FINES	• 1/	SP-S	SM	POORLY GRADED SAND WITH SILT, POORLY GRADED SAND WITH SILT AND GRAVEL
W_USCS]	• Fine grained soils that plot within the hatched area on the Plasticity Chart, and coarse grained soils with between 5% and 12% passing the 200 sieve require dual USCS symbols, ie., CL-ML, GW-GM, GP-GM, GW-GC, GP-GC, GC-GM, SW-SM, SP-SM, SW-SC, SP-SC, SC-SM.	No.		more of co			SP-	SC	POORLY GRADED SAND WITH CLAY, POORLY GRADED SAND WITH CLAY AND GRAVEL (OR SILTY CLAY AND GRAVEL)
CS_KEY_	 If sampler is not able to be driven at least 6 inches then 50/X indicate number of blows required to drive the identified sampler X inches with a 140 pound hammer falling 30 inches. 			(50% or n			SI	/	SILTY SAND, SILTY SAND WITH GRAVEL
LKLF_ENV_LEG1_GRAPHICS_KEY_W	ABBREVIATIONS WOH - Weight of Hammer			SANDS (SANDS WITH > 12% FINES		so	:	CLAYEY SAND, CLAYEY SAND WITH GRAVEL
ENV_LEG	WOR - Weight of Rod <u>NAPL INDICATOR</u> S - Saturated with NAPL D - Deviting in a factor of MAPL						SC-	SM	SILTY, CLAYEY SAND, SILTY, CLAYEY SAND WITH GRAVEL
KLF	P - Positive indication of NAPL SP - Slightly Positive with NAPL U - Undetectable NAPL U - Undetectable NAPL			•				ML	SILT, SILT WITH SAND, SILT WITH GRAVEL
	REFERENCES		OILS	the No. #200 sieve)	SILTS AND	CLAYS		CL	LEAN CLAY, LEAN CLAY WITH SAND, LEAN CLAY WITH GRAVEL
023.G	1. American Society for Materials and Testing (ASTM), 2011, ASTM D2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System).			e par 0 sie	(Liquid L less thar			CL-ML	SILTY CLAY, SILTY CLAY WITH SAND, SILTY CLAY WITH GRAVEL
RY_2	Classification System).		MINI	.#20			╞═╛	OL	ORGANIC CLAY, ORGANIC CLAY WITH SAND, ORGANIC CLAY WITH GRAVEL, ORGANIC SILT, ORGANIC SILT WITH SAND, ORGANIC SILT WITH GRAVEL
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NTL			FIN	ĕ₽	(Liquid L 50 or gre			СН	FAT CLAY, FAT CLAY WITH SAND, FAT CLAY WITH GRAVEL
IDARD_G			NOTE: US		E MATERIA			OH ION O	ORGANIC SLAY, ORGANIC SLAY WITH SAND, ORGANIC SLAY WITH GRAVEL, ORGANIC SILT, ORGANIC SILT WITH SAND, ORGANIC SILT WITH GRAVEL N THE LOG TO DEFINE A GRAPHIC THAT MAY NOT BE
E:KLF_STANDARD_GINT_LIBRARY_2023.GLB	\bigcap		IECT N 3667.0						GRAPHICS KEY
INT TEMPLATE: E	KLEINFELDER Bright People. Right Solutions.		VN BY:		DG			Wel	I 3 PFAS Piloting and Preliminary Design
TEMF			CKED I		LS				25 Birch Street Millis, MA
L		DATE	:	:	3/13/2023				

Date Beg	jin -	End:	3/10/2023			Dri	lling Company:	Geosearch		BORING LOG	ow-	101
Logged E	By:		D Garvey			Dri	II Crew:	Shawn Preston				
HorVert	. Da	tum:	WGS 1984 -	Not Avai	lable	Dri	lling Equipment:	Geoprobe				
Plunge:			-90 degrees			Dri	lling Method:	See Drilling Method Co	olumn			
Weather			28°F Clear			Exp	oloration Diameter:	2.25 in. O.D.				
FI						FIELI	DEXPLORATION			MONITORING WELL CONSTR	UCTIO	DN
Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log		Latitude: 42.16871° Longitude: -71.33988° Irface Condition: Ground		Completion Method: Stand Pipe - 3 feet above grade		
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-			OW-101 (2.5-5')		5.9					2" SCH 40 Solid PVC Riser - Bentonite -		•
5					5.8			ND with Silt (SP-SM) : eddish brown, moist, n		-		
-	Direct Push				0.8				-10.0			
10− 					2		Poorly Graded SAI olive yellow, wet, tra	ND (SP) : medium to co ace gravel		- Sand - 2" SCH 40 Slotted 0.010 -		
-					0.5				15.0	PVC Pipe		
15					0.5		Poorly Graded GR brown, wet, trace s	AVEL (GP) : coarse-gr and	-15.0 ained, reddish -17.0	-		
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-							PROJECT NO.: 20233667.001A		BORI	NG LOG OW-101		
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1A OFFICE FILTER: BOSTON

gINT FILE: KIF_gint_master_2023 PROJECT NUMBER: 20233667.001A gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2023.GLB [_KLF_ENVIRONMENTAL LOG]





MEMORANDUM

TO:	Town of Millis, Board of Health
FROM:	Gregory Avenia, P.E., Kleinfelder
DATE :	1/12/24
SUBJECT:	Millis Well 3 Treatment Facility Tight Tank Design
CC:	Tyler Bernier, Project Manager, Kleinfelder
	Jim McKay, DPW Director, Town of Millis

In support of a new water treatment facility, Kleinfelder is proposing to install a tight tank to manage the facility's wastewater needs. The proposed facility is directly associated with the public water supply. This memorandum is meant to communicate the conditions that necessitate the installation of a tight tank over more preferred options and the basis of design for the proposed system.

- The project is within 200 feet of a drinking water well. Due to the proximity to Well 3 and its associated protective area, a traditional septic system is not permissible per public drinking water protections. Installing a septic system would require additional tree clearing approximately 200 feet away from the site and may still have negative impacts on future drinking water quality.
- The project is approximately 2,000 feet from (horizontally) and 30 feet below (vertically) the nearest sewer connection in Village Street. Access to the site is provided by a small gravel access drive 1,500 feet in length. Connection to Millis' existing sewer infrastructure would require approximately 3,500 linear feet of new sewer force main and a lift station. This solution was deemed to be cost prohibitive during the preliminary design phase of the project.
- The facility is a public water supply facility with minimal wastewater demand. The installation of more robust sewer management system would be unnecessary and excessively expensive.

The proposed tight tank is located as far as reasonably possible from the well under the proposed design. The Town of Millis is committed to engaging with a licensed septage transporter to manage the pump-out and disposal of waste on an as-needed basis dictated by the alarm system.



1 BASIS OF DESIGN

The proposed system consists of a 2,500-gallon tight tank connected to the treatment facility with approximately 140 feet of Blue Brute DR25 PVC. The tight tank will be equipped with a high-water level alarm system set to the elevation at which the tank will contain 2,000 gallons of wastewater. The system has been designed in compliance with 310 CMR 15.000 or "Title 5" and will be installed as shown on the plans accompanying this memo.

The following is a non-exclusive list of site conditions justifying the design and installation of the tight tank system.

- Millis Well 3 is 181 feet from the tight tank. The entire project is within the 400-foot radius of the MassDEP Zone I protective area surrounding the well.
- There are no wetlands within 100 of the tight tank.
- As outlined above, the proposed tight tank will serve a public water supply facility where it is not feasible to connect to a public sewer.

The sizing of the tank was determined in accordance with Title 5. The associated calculations are below:

Daily Sewage Flow

Use: Factory, Industrial Plant, No Cafeteria Daily Design Flow = 15 GPD per employee Daily Flow (Required) 15 GPD x 2 Employees Total Daily Flow Well 3 Treatment Facility = 30 GPD

<u>Tight Tank</u>

2,500 Gallon Tank

Must contain 500% of septic requirements per 310 CMR 15.203 48-hour storage capacity in compartment 30 GPD x 2 Days = 60 gallons storage required 500% of 60 gallons = 300 gallons 2000-gallon minimum tank size per 310 CMR 15.260 Total Storage: 2,500 gallons > 2,000 gallons



The required buoyancy calculations in accordance with Title 5 are below:

Assumptions/Initial Information:

Groundwater at elevation 123 per worst case FEMA flood evaluation Earth cover depth = 36 inches Weight of earth = 110 pcf Weight of water = 62.4 pcf Outer tank dimensions (L x W x H) = (15' x 7' x 6.25') Inner tank dimensions (L x W x H) = (14' x 6' x 5.25') Weight of tank (2,500-gallon tank empty per manufacturer) = 31,800 lbs

Buoyancy Calculation

Using outer tank dimensions

Weight of earth on tank = $(L \times W \times Earth Cover) *$ (Weight of earth) = $(15' \times 7' \times 3') * (110 \text{ pcf})$ = 34,560 lbs

Weight of tank + Weight of earth on tank = 66,450 lbs.

Hydrostatic pressure = (L x W x SHGW height) * (Weight of water) = $(15' \times 7' \times 6.8')$ * (62.4 pcf) = 44,553.6 lbs

Hydrostatic pressure = 44,553.6 lbs < 66,450 lbs = Weight of tank + Weight of earth on tank (OK)

The alarm height was set at the volume at which the tank will contain 2,000 gallons of wastewater as calculated below:

<u>Alarm Height</u>

Using inner tank dimensions

Volume below alarm = 2,000 gallons or 267.361 cf = (L x W x Alarm height) Alarm height = 267.361 cf/(L x W) = 267.361 cf/(14' x 6')

Alarm height = 3.18 feet

Town of Millis Board of Health 900 Main Street Millis, MA 02057

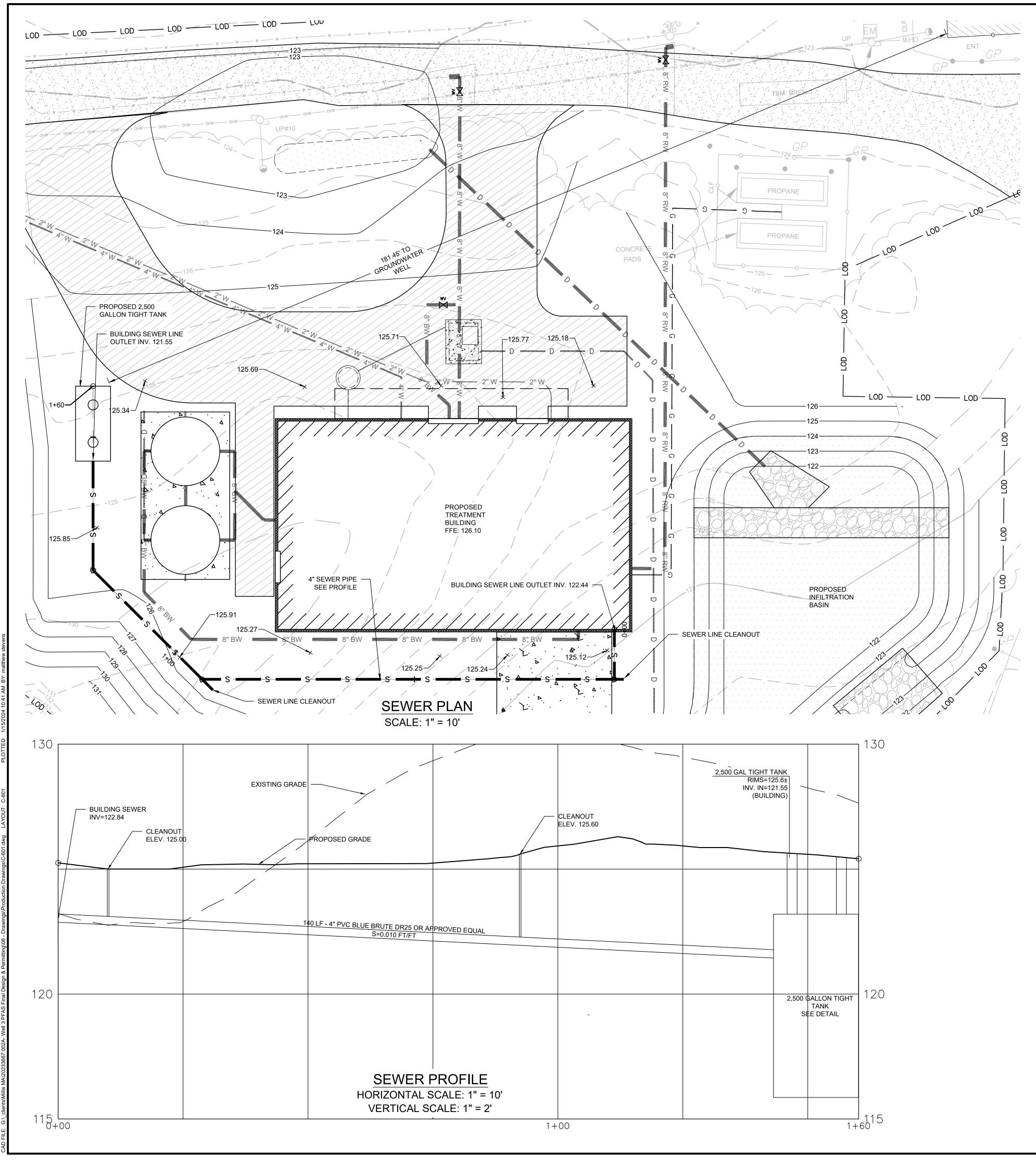
SUBJECT: Well 3 Treatment Facility Tight Tank Design

Dear Members of the Board of Health:

A tight tank is proposed to support the operations of the new water treatment facility at Well 3 on Village Street in Millis. A plan for the transport and disposal of the contents of the tight tank is required. Prior to the operation of the proposed tight tank system, the Town of Millis Public Works/Highway Department is committed to engaging with a licensed septage transporter to manage the pump-out and disposal of waste on an as-needed basis dictated by the alarm system.

Sincerely,

/im McKay N DPW Director, Town of Millis



NOTES:

- SHOWN.
- COMMISSION.
- 4. MILLIS WELL 3 IS 181 FEET FROM THE TIGHT TANK.
- AREA SURROUNDING THE WELL. 6. THERE ARE NO WETLANDS WITHIN 100 OF THE TIGHT TANK.

ARE BELOW:

DAILY SEWAGE FLOW

- USE: FACTORY, INDUSTRIAL PLANT, NO CAFETERIA
- DAILY DESIGN FLOW = 15 GPD PER EMPLOYEE

TIGHT TANK

2,500 GALLON TANK 500% OF 60 GALLONS = 300 GALLONS 2000-GALLON MINIMUM TANK SIZE PER 310 CMR 15.260

1. THE PROPOSED DESIGN COMPLIES WITH TITLE 5 REQUIREMENTS AND SHALL BE INSTALLED AS

2. THE MILLIS ELECTRICAL INSPECTOR SHALL BE NOTIFIED AT LEAST 36 HOURS PRIOR TO INSTALLATION OF THE ALARM SYSTEM AND ASSOCIATED ELECTRICAL COMPONENTS. 3. THE PROJECT NOI WAS APPROVED WITH SPECIAL CONDITIONS BY THE MILLIS CONSERVATION

5. THE ENTIRE PROJECT IS WITHIN THE 400-FOOT RADIUS OF THE MASSDEP ZONE I PROTECTIVE

7. THE PROPOSED TIGHT TANK WILL SERVE A PUBLIC WATER SUPPLY FACILITY WHERE IT IS NOT FEASIBLE TO CONNECT TO A PUBLIC SEWER.

THE SIZING OF THE TANK WAS DETERMINED IN ACCORDANCE WITH TITLE 5. THE ASSOCIATED CALCULATIONS

- DAILY FLOW (REQUIRED) 15 GPD X 2 EMPLOYEES
- TOTAL DAILY FLOW WELL 3 TREATMENT FACILITY = 30 GPD

MUST CONTAIN 500% OF SEPTIC REQUIREMENTS PER 310 CMR 15.203

48-HOUR STORAGE CAPACITY IN COMPARTMENT 30 GPD X 2 DAYS = 60 GALLONS STORAGE REQUIRED

TOTAL STORAGE: 2,500 GALLONS > 2,000 GALLONS

	KLEINFELDER Bright People. Right Solutions.										
	Boston, N	reet, Suite 8100 /A 02108 7-497-7800									
-	www.klein	felder.com									
	GREGORY AVENIA CIVIL										
	HOL 51461 HOL 51461 HOL STERE										
	1/1	5/2024 SIONS									
REV	DESCRIPTION	DSN CHK DWN APP									
		SCALE VERIFICATION THIS BAR IS 1 INCH IN LENGTH									
	N	ON ORIGINAL DRAWING 0 1" L IF IT'S NOT 1 INCH ON THIS									
	Å	SHEET ADJUST YOUR SCALES ACCORDINGLY									
		0 20 SCALE IN FEET									
		NG SIZE IS 24 x 36									
	TOWN OF MILLIS,	MASSACHUSETTS EATMENT FACILITY									
	OR OPATEL	FEB 24 HOS									
		MASS.									
		F MILLIS F PUBLIC WORKS ILLIS, MA 02054									
	PERMIT RE	EVIEW SET									
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