



# TOWN OF EXETER, NEW HAMPSHIRE

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10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 • FAX 772-4709  
[www.exeternh.gov](http://www.exeternh.gov)

## LEGAL NOTICE EXETER PLANNING BOARD AGENDA

The Exeter Planning Board will meet on Thursday, April 13, 2023 at 7:00 P.M. in the Nowak Room of the Exeter Town Office building located at 10 Front Street, Exeter, New Hampshire to consider the following:

**APPROVAL OF MINUTES:** January 26, February 9 and March 23, 2023

### **NEW BUSINESS:**

The application of Richard and Debbi Schaefer for a minor subdivision of the existing 21+/- acre parcel located at 24 Powder Mill Road. The Applicant is proposing to subdivide off a 5.01+/- acre parcel with frontage on Powder Mill Road for a new residence. The subject property is located in the R-1, Low Density Residential zoning district. Tax Map Parcel #102-4. PB Case #23-3.

The application of C/A Design, Inc. (Wakefield Thermal) for a site plan review for the proposed construction of a 40,000 SF addition to an existing industrial building, expanded parking, loading areas and associated site improvements on the property located at 131 Portsmouth Avenue. The subject property is located in the CT-Corporate Technology Park and C-2 Highway Commercial zoning districts. Tax Map Parcel #52-112. PB Case #23-4.

### **OTHER BUSINESS**

- Master Plan Discussion
- Land Use Regulations Review
- Field Modifications
- Bond and/or Letter of Credit Reductions and Releases

**EXETER PLANNING BOARD**  
*Langdon J. Plumer, Chairman*

*Posted 03/31/23: Exeter Town Office and Town of Exeter website*

1                                   **TOWN OF EXETER**  
2                                   **PLANNING BOARD**  
3                                   **NOWAK ROOM – TOWN OFFICE BUILDING**  
4                                   **10 FRONT STREET**  
5                                   **JANUARY 26, 2023**  
6                                   **7:00 PM**  
7                                   **DRAFT MINUTES**

8   **I. PRELIMINARIES:**  
9

10 **BOARD MEMBERS PRESENT BY ROLL CALL:** Chair Langdon Plumer, Vice-Chair Aaron Brown,  
11 John Grueter, Jennifer Martel, Gwen English and Nancy Belanger Select Board Representative  
12

13 **STAFF PRESENT:** Town Planner Dave Sharples  
14

15 **II. CALL TO ORDER:** Chair Plumer called the meeting to order at 7:00 PM and introduced the  
16 members.  
17

18 **III. OLD BUSINESS**  
19

20 **APPROVAL OF MINUTES**  
21

22 December 22, 2022  
23

24 Ms. Belanger, Ms. Martel and Mr. Grueter recommended edits.  
25

26 ***Mr. Grueter motioned to approve the December 22, 2022 minutes, as amended. Ms. Belanger***  
27 ***seconded the motion. The motion passed 6-0-0.***  
28

29 January 12, 2023  
30

31 Ms. Belanger and Ms. English recommended edits.  
32

33 ***Ms. Belanger motioned to approve the January 12, 2023 minutes, as amended. Ms. English seconded***  
34 ***the motion. A vote was taken, Chair Plumer abstained. The motion passed 5-0-1.***  
35

36 **IV. NEW BUSINESS: PUBLIC HEARINGS:**

37 1. Public hearing on the proposed zoning amendments for consideration on the 2023 Town Warrant.  
38 ***Copies of the full text of the proposed amendments are available in the Planning Office and posted on***  
39 ***the Town website.***  
40

41 Amend Article 9.4 Floodplain Development Ordinance by adding language to the ordinance to  
42 strengthen the town's resilience to increased flooding events and to reduce impacts associated with  
43 rising sea levels.

44  
45 The Planning Board is considering to REPLACE the existing Town of Exeter Zoning Ordinance with a new  
46 Zoning Ordinance that will reduce the number of zoning districts, encourage development where  
47 infrastructure exists to support it, allow flexibility to property owners to utilize their property consistent  
48 with the existing use while maintaining minimum standards to protect surrounding properties, and to  
49 incentivize the creation of diverse housing options. The proposal also aims to reduce ambiguities in the  
50 ordinance by revising wording and adding definitions. (Please note that although the proposal is to  
51 replace the existing Zoning Ordinance, the majority of the existing Zoning Ordinance will remain  
52 unchanged)

53  
54 Mr. Sharples noted the Planning Board discussed the proposed zoning amendments at several meetings  
55 and public outreach was held at a public forum on January 5, 2023. The first public hearing was held on  
56 January 12, 2023.

57  
58 Chair Plumer read out loud the public hearing notice and opened the public hearing. Mr. Sharples noted  
59 there was no public present.

60  
61 Mr. Sharples noted the intent to amend Article 9.4 Floodplain Development Ordinance by adding  
62 language to the ordinance to strengthen the town's resilience to increased flooding events and to  
63 reduce impacts associated with rising sea levels.

64  
65 Mr. Sharples noted the Planning Board is considering replacing the existing Town of Exeter Zoning  
66 Ordinance with a new Zoning Ordinance that will reduce the number of zoning districts, encourage  
67 development where infrastructure exists to support it, allow flexibility to property owners to utilize their  
68 property consistent with the existing use while maintaining minimum standards to protect surrounding  
69 properties, and to incentivize the creation of diverse housing options. The proposal also aims to reduce  
70 ambiguities in the ordinance by revising wording and adding definitions. (Please note that although the  
71 proposal is to replace the existing Zoning Ordinance, the majority of the existing Zoning Ordinance will  
72 remain unchanged). At the January 12th meeting, Mr. Sharples explained to the Board that he felt that  
73 this amendment was not ready yet to move forward to the upcoming March Warrant. The Board's  
74 consensus was to hold off and work through reviewing the proposed changes on a monthly basis to  
75 continue to refine and understand the amendment. Mr. Sharples noted he will be prepared with an  
76 outline for the review by the Board and has a draft outline but it still needs work so I will bring it to the  
77 meeting for discussion. After holding the second public hearing, the board needs to vote to move or not  
78 move the amendments to the 2023 Warrant.

79  
80 Mr. Sharples noted before moving onto the outline he wanted to first provide the Board with some  
81 background information such as **goals and land use decisions**. (see tape 49 mins). Mr. Sharples noted he  
82 wanted to provide the public with an explanation of roles in residential and non-residential zones and  
83 have them better understand those. For example if the height were to change, what does that mean  
84 and what is density, setbacks and dimensional standards and provide some real life examples.

85 Ms. English asked where a height change might take place and Mr. Sharples noted there are less height  
86 changes in the new proposal, agricultural (farms) are exempt. Mr. Sharples explained how height could  
87 be determined by the number of feet setback from the road.

88  
89 Mr. Sharples noted the review of the zoning district amendments and accompanying ordinance changes  
90 would be a standing agenda item for about one hour at each meeting. Ms. Martel expressed concerns  
91 when the Board may be busy with applications and recommended a flexible schedule. Mr. Sharples  
92 noted a special meeting could be held if they fall behind but the state mandates that applications be  
93 heard within 30 days. The Board meets more than once per month so the second meeting could have  
94 time for review of the zoning district amendments. Mr. Grueter agreed the Board could see how it goes  
95 for the next two or three months. Mr. Sharples noted he got rid of the schedule for that reason and will  
96 plan about 13-14 meetings over the next six months to focus on review.

97  
98 Mr. Sharples discussed the Flood Plain Ordinance amendment to Section 9.4 and provided the Board  
99 with the amendments, language removed and added. He noted that it was reviewed line by line and a  
100 purpose statement was added. The base flood elevation went to 2' above. Market value has been  
101 defined and owners can use the town's assessed value or get an appraisal. An advisory area has been  
102 added to inform owners of the Cape study and make recommendations.

103  
104 Mr. Sharples provided the Board with a draft of the warrant article. Ms. Martel expressed concerns with  
105 how the article was worded and that it may confuse owners unless it is spelled out that this is new  
106 construction within the special hazard flood plain, not all over town. Mr. Sharples noted this is a  
107 preliminary draft and will be sent to the Town Manager tomorrow. Vice-Chair Brown agreed it was  
108 difficult to read and noted a map would be helpful. Mr. Sharples noted maps are not put in the warrant  
109 article but the Town Manager prepares a supplemental fact sheet. Ms. Belanger agreed that certain  
110 items are not allowed in the polling place and recommended voters take some time to familiarize  
111 themselves with the articles before voting. Vice-Chair Brown noted ExeterTV could do a segment. Ms.  
112 Belanger noted that ExeterTV may be able to do some segments to follow the zoning district  
113 amendments over the next several months as well.

114  
115 Mr. Sharples read the article and the Board agreed the first sentence was acceptable but needed a  
116 question mark. Mr. Sharples noted he would add that exceptions are made for septic systems in the  
117 event of system failure and that it would require all new construction within the regulated flood plain  
118 area be elevated.

119  
120 Vice-Chair Brown asked if there could be numbering. Mr. Sharples will check.

121  
122 **Ms. English motioned that the Board place the proposed amendment, regarding Article 9.4 Floodplain**  
123 **Development Ordinance, with the revision date of December 30, 2023, on the 2023 Town Warrant**  
124 **with a recommendation for adoption. Ms. Belanger seconded the motion. A roll call vote was taken:**  
125 **Belanger – aye, Grueter – aye, Brown – aye, Plumer – aye, Martel – aye and English – aye. The motion**  
126 **passed 6-0-0.**

127  
128

129 **VI. OTHER BUSINESS**

130 Vice-Chair Brown raised concerns about monitoring workforce housing, being sure that it stays that way.

131 Mr. Sharples noted there is always going to be something you can't catch; while sales are good because  
132 it would stay on the deed, renting may be an issue. A transfer certificate has been required since 2005.

133 Ms. Belanger noted Rockingham Planning Commission (RPC), New Hampshire Housing Authority and the  
134 Housing Advisory Committee (HAC) have been looking at this and does not think it should be Exeter's  
135 cost. Mr. Grueter asked if it is a state issue. Mr. Sharples indicated no state agency exists for  
136 monitoring and would need to be created. Annual reporting should be done by the property owner but  
137 there needs to be someone to verify the information and if not received follow up. Vice-Chair Brown  
138 noted there should be some sort of penalty. Vice-Chair Brown asked if when approved they are for 30  
139 years or in perpetuity. Mr. Sharples indicated he believed they were approved in perpetuity but will  
140 check.

141 Mr. Grueter asked what incentives there are for complying. Mr. Sharples noted that first workforce  
142 housing must first be allowed. He explained the MUND incentive. As an example he stated that if in C-1  
143 zone and the developer could have one unit every 3,500 SF or 12 units then in MUND there would be no  
144 cap on density and for height but 10% of the units have to be workforce housing; now the developer can  
145 build 18 instead of 12. Mr. Grueter noted that is all up front.

146 Mr. Sharples noted failure to comply could result in revocation of the site plan which would in turn have  
147 the Building Inspector revoke the Certificate of Occupancy and once letters are sent and there is still no  
148 compliance they can go to Superior Court and incur penalties daily at \$250/day-\$500/day. Mr. Grueter  
149 asked if you could just remove two units or require more workforce units due to lack of compliance, i.e.  
150 two becomes four. Vice-Chair Brown recommended incorporation into the Planning Board Vote. Mr.  
151 Sharples noted there could be an Affordable Housing Agreement provided by the developer at their cost  
152 and reviewed by town counsel, which would also require that a copy of the executed lease be provided,  
153 setting forth consequences for failure to comply. Mr. Sharples recommended waiting until they had an  
154 application to ask the developer to draft the agreement and have it reviewed by legal.

155 Ms. Belanger noted there would be an All Board's Meeting on February 8, 2023 from 6PM-9PM. Chair  
156 Plumer will ask Ms. McEvoy to send the information out.

- 157
- Master Plan Discussion
  - 158 • Field Modifications
  - 159 • Bond and/or Letter of Credit Reductions and Release
- 160

161 **VII. TOWN PLANNER'S ITEMS**

162 **VIII. CHAIRPERSON'S ITEMS**

163 **IX. PB REPRESENTATIVE'S REPORT ON "OTHER COMMITTEE ACTIVITY"**

164 **X. ADJOURN.**

165 ***Ms. Belanger motioned to adjourn the meeting at 8:22 PM. Vice-Chair Brown seconded the motion.***  
166 ***A vote was taken all were in favor, the motion passed 6-0-0.***

167

168 Respectfully submitted,

169 Daniel Hoijer,  
170 Recording Secretary  
171 Via Exeter TV

1                                   **TOWN OF EXETER**  
2                                   **PLANNING BOARD**  
3                           **NOWAK ROOM – TOWN OFFICE BUILDING**  
4                                   **10 FRONT STREET**  
5                                   **FEBRUARY 9, 2023**  
6                                   **DRAFT MINUTES**  
7                                   **WORK SESSION**  
8                           **LAND USE REGULATIONS**  
9                                   **7:00 PM**

10 **I. PRELIMINARIES:**

11  
12 **BOARD MEMBERS PRESENT BY ROLL CALL:** Chair Langdon Plumer, Pete Cameron, Clerk,  
13 Jennifer Martel, Gwen English, Alternate Dan Chartrand and Nancy Belanger Select Board  
14 Representative  
15

16 **STAFF PRESENT:** Town Planner Dave Sharples  
17

18 **II. CALL TO ORDER:** Chair Plumer called the meeting to order at 7:00 PM and introduced the  
19 members.  
20

21 **III. OLD BUSINESS**  
22

23 **APPROVAL OF MINUTES**  
24

25 January 26, 2023 - *Tabled*  
26

27 **IV. NEW BUSINESS:**

28 There being no public hearings scheduled, the Board conducted a work session on land use  
29 regulations.

30 Mr. Sharples presented his plan for the educational component of public outreach relative to  
31 the zoning amendments proposed for 2024.

32 Mr. Sharples indicated he would be looking for feedback from the Board over the next several  
33 months and will include GIS mapping and tours. He has asked Bob Glowacky of Exeter TV to  
34 present the segments entitled *Land Use Planning Series*, Envisioning Exeter’s Future. He noted  
35 that the segments would also make great training for new members. He noted the potential  
36 launch date is the second week of March.

37 Mr. Sharples stated that what he will be looking for from the Board is their commitment to  
38 attend the sessions, participation in homework, doublechecking his math and participating in  
39 discussions.

40 Mr. Sharples indicated he is looking to accomplish educating the public, considering the what  
41 and where of potential growth and fitting the vision.

42 Mr. Cameron questioned whether the when should be a consideration. Mr. Sharples noted  
43 that while the Board can encourage growth, it has no control over when those opportunities  
44 will be taken advantage of. Mr. Chartrand noted the Board can encourage it such as with the  
45 Tiff Road. Mr. Chartrand noted the RT District has been brought up. He noted the corner  
46 stores, most of which couldn't be built today, are treasured by people and that variation can be  
47 what people find delight in.

48 Mr. Cameron questioned what is the vision? He noted the Master Plan and growth on  
49 Portsmouth Ave over the next 10-20-30 years. Mr. Chartrand noted not seeing empty parking  
50 lots. Mr. Cameron asked if the vision were changeable and Mr. Sharples noted site plan and  
51 subdivision regulations change, potentially every year.

52 Mr. Sharples indicated he will be reviewing decisions made through applications versus policy;  
53 the impact on communities (financial, environmental and social – the three legs of  
54 sustainability); how Exeter has developed, patterns and how they came about; current  
55 regulations the Board may like to see improved and the role of regulations – what and why:  
56 density, height, parking, setbacks, frontage, building code, stormwater, floodplains, traffic,  
57 waste disposal, water availability, potential natural resources, signs, architecture, lighting,  
58 roadway and parking design and landscaping. Applications can be reactionary. He  
59 recommended being aware of the impact of choices.

60 Mr. Sharples posed the question to the Board whether there was ever a situation where they  
61 didn't particularly like the application before them but had to say yes. He compared the effect  
62 of 50 units being built where there is supporting infrastructure versus where there is more  
63 impervious surface and more road required to be built.

64 Mr. Cameron raised concerns with objectivity and subjectivity and cautioned being too  
65 subjective. Mr. Sharples noted that can't be avoided.

66 Mr. Sharples posed the question to the Board what they felt were pressing issues the  
67 community is facing today such as affordable housing. He asked the Board to consider what  
68 undeveloped sites do for us, the benefits of cost and to the environment.

69 Ms. Martel asked about Complete Streets studies and intersection studies and whether zoning  
70 could be used to make Exeter feel less car oriented and pedestrians feel safer. The circular  
71 pattern and lighting need improvement downtown. She questioned whether the amount of  
72 cars downtown could be reduced. Ms. Belanger noted the traffic pattern can make a



73 difference. Mr. Sharples noted he was not sure how land use regulations, which regulate  
74 private property, could be used to reduce the number of cars but can make downtown safer for  
75 pedestrians. He noted one problem is that timed parking is not enforced as it could be leaving  
76 people to circle or slow to find spots which could be alleviated with more turn over.

77 Mr. Sharples stated that he would like to do more research on who should be involved. Horsley  
78 Witten is interested in being a part of this and he plans to reach out to the Academy and  
79 Hospital. Ms. Murphy recommended NH Listens as a facilitator. Mr. Chartrand recommended  
80 the Chamber of Commerce. Ms. English recommended an intern from Tufts, a grad student, to  
81 speak to emerging trends.

82 Mr. Sharples indicated he would provide information concerning current capacities such as  
83 school, transportation, water, etc. Mr. Chartrand commented on growth of water, sewer, taxes  
84 and questioned what should be the sweet spot. Ms. Belanger commented on the ability to live  
85 and work downtown and noted the Housing Advisory Committee will be looking at elderly  
86 housing.

87 Ms. Martel asked if tours would be during meeting times. Mr. Sharples noted he will get the  
88 Parks & Recreation Van.

## 89 **VI. OTHER BUSINESS**

- 90 • Master Plan Discussion

91  
92 Mr. Sharples noted, progress wise, there are 67 action items, 50 being worked on or  
93 completed, 11 from each category.

- 94
- 95 • Land Use Regulations Review
- 96
- 97 • Field Modifications
- 98
- 99 • Bond and/or Letter of Credit Reductions and Release

100

## 101 **VII. TOWN PLANNER'S ITEMS**

102 Mr. Sharples reported the Spring Planning & Zoning Conference is coming up in the spring and will be  
103 online.

## 104 **VIII. CHAIRPERSON'S ITEMS**

105 Chair Plumer reported that he, Ms. English, Ms. Belanger and Mr. Grueter attended the All Boards  
106 Meeting and it was recorded by Exeter TV. They discussed improving communication and online  
107 training.

108

109 **IX. PB REPRESENTATIVE'S REPORT ON "OTHER COMMITTEE ACTIVITY"**

110 **X. ADJOURN.**

111 *Mr. Cameron motioned to adjourn the meeting at 8:19 PM. Ms. Belanger seconded the motion. A*  
112 *vote was taken all were in favor, the motion passed 5-0-0.*

113

114 Respectfully submitted,

115 Daniel Hoijer,

116 Recording Secretary

117 Via Exeter TV

1                                   **TOWN OF EXETER**  
2                                   **PLANNING BOARD**  
3                                   **NOWAK ROOM – TOWN OFFICE BUILDING**  
4                                   **10 FRONT STREET**  
5                                   **MARCH 23, 2023**  
6                                   **DRAFT MINUTES**  
7                                   **WORK SESSION**  
8                                   **LAND USE REGULATIONS**  
9                                   **7:00 PM**

10 **I. PRELIMINARIES:**

11  
12 **BOARD MEMBERS PRESENT BY ROLL CALL:** Chair Langdon Plumer, Pete Cameron, Clerk,  
13 Jennifer Martel, Gwen English, and Nancy Belanger Select Board Representative

14  
15 **STAFF PRESENT:** Town Planner Dave Sharples

16  
17 **II. CALL TO ORDER:** Chair Plumer called the meeting to order at 7:00 PM and introduced the  
18 members.

19  
20 **III. OLD BUSINESS**

21  
22 **APPROVAL OF MINUTES**

23  
24 January 26, 2023 and February 9, 2023 - *Tabled*

25  
26 **IV. NEW BUSINESS:**

27 There being no public hearings scheduled, the Board conducted a work session on land use  
28 regulations.

29 Mr. Sharples presented the first segment of the Exeter Planning Series – Envisioning Exeter’s  
30 Future. He noted the first part would be to look at the benefits of undeveloped land.

31 Mr. Sharples noted some benefits include: flood protection, air and water quality, wildlife  
32 habitat, absorption of pollutants, recreation, biodiversity, temperature regulation, low cost to  
33 the tax base, minerals and other provisions and emotions in the social emotional aspect.

34 Mr. Sharples reviewed aspects of flood protection noting how vegetation stores water so that it  
35 reduces flooding and uptakes water from the soil. There are little or no impervious surfaces  
36 other than some bedrock.

37 Mr. Sharples reviewed the benefits to air and water quality. He noted pollutants are absorbed  
38 and nitrogen and phosphorus. Soil absorbs and binds harmful elements. Ammonia is usable by  
39 plants for growth. Carbon is reduced in the atmosphere.

40 Mr. Sharples noted that much wildlife depends on large swatch of unfragmented land. Mr.  
41 Sharples cited on example, the Northern Long Eared Bat and how there is no logging between  
42 May 15<sup>th</sup> and August 15<sup>th</sup>. Mr. Sharples noted biodiversity adds resilience and helps maintain  
43 balance.

44 Mr. Sharples talked about recreation: hiking, biking, bird watching, snowshoeing, and kids  
45 playing which can all improve physical and mental health. Chair Plumer added hunting and  
46 fishing.

47 Mr. Cameron talked about destruction by careless recreation and the importance of not  
48 degrading the undeveloped land. Mr. Sharples agreed that the land must be respected and use  
49 being sustainable.

50 Mr. Sharples discussed how undeveloped land and shade trees can regulate temperature. It  
51 can be 20 to 45 degrees cooler in the shade. Trees along streams and vernal pools will reduce  
52 the water temperature so that cold water species can spawn, such as Trout and Salmon.

53 Mr. Sharples talked about the tax base and how undeveloped land doesn't add much to  
54 municipal costs such as police, fire, school, traffic, plowing, sanding and lawsuits but does  
55 generate regular taxes, excepting current use which is somewhat less.

56 Mr. Sharples noted everyday items and materials all come from the environment. As an  
57 example he showed a pen which would take many years to break down in the land fill but  
58 comes from compounds made from the environment. Mr. Sharples indicated the number of  
59 square miles on the Earth's surface and how many were water compared to the number of  
60 people on the earth and how many acres would be afforded to produce what each of us need.  
61 He noted a parking lot doesn't provide that.

62 Mr. Sharples spoke about the connection people feel to land, and how it relieves stress and  
63 improves wellbeing. People can get upset when that connection is disturbed by development.

64 Mr. Sharples concluded that the next segment will review the benefits of developed land.

65 Mr. Sharples asked if anyone was able to answer the question posed at the last meeting which  
66 was what is the tallest building in Exeter and how tall it is. He noted it was a tie between the  
67 Exeter Hospital and PEA Library which are about 80.'

68 Mr. Sharples asked if anyone knew the densest subdivision in Exeter, not including mobile  
69 home parks, and will provide the answer at the April 27<sup>th</sup> meeting. Ms. English noted the  
70 presentation made her think of the documentary the Biggest Little Farm which took an old  
71 dried up peach farm transformed over seven years with the environment balanced out.

72 **VI. OTHER BUSINESS**

- 73 • Master Plan Discussion
- 74
- 75 • Land Use Regulations Review
- 76
- 77 • Field Modifications
- 78
- 79 • Bond and/or Letter of Credit Reductions and Release
- 80

81 **VII. TOWN PLANNER'S ITEMS**

82 Mr. Sharples reported a letter was received from NH Department of Transportation (DOT) relative to the  
83 Gateway Development approved on 08/20/2020. He noted at the time there was a traffic impact  
84 analysis done by third party peer review – Jason Plourde of VHB. Condition #13 concerned a letter  
85 about the access points from NH DOT prior to signing the final plans. At the preconstruction meeting  
86 the applicant did not have conditions #13 and #14. Mr. Sharples noted he contacted District 6 and was  
87 told they were not sending a letter because the urban compact area is not in their jurisdiction. The final  
88 plans were signed. After two years had passed Mr. Sharples reported receipt of a letter from District 6  
89 stating that they did not support the project. Mr. Sharples met with a couple of representatives on  
90 Tuesday to discuss the TIF District and Mr. Sharples requested they look at Exit 9. They had previously  
91 requested a corridor study, which was done by VHB and provided to DOT with not much traction. Mr.  
92 Sharples impressed upon DOT his safety concerns with the current and future uses. Mr. Sharples noted  
93 the frustration is the right of way (ROW) is DOT's.

94 Chair Plumer asked if Rockingham Planning Commission (RPC) is involved, and Mr. Sharples indicated  
95 they are and that road safety audit funds might open the door for additional funding which were  
96 submitted on those and some others.

97 Mr. Cameron asked if there was any incentive to get DOT to do something and Mr. Sharples indicated  
98 that discussions kicked off at Tuesday's meeting to start.

99 **VIII. CHAIRPERSON'S ITEMS**

100 **IX. PB REPRESENTATIVE'S REPORT ON "OTHER COMMITTEE ACTIVITY"**

101

102 **X. ADJOURN**

103 Mr. Sharples noted the next meeting is April 13<sup>th</sup>.

104 ***Ms. English motioned to adjourn the meeting at 8:37 PM. Ms. Belanger seconded the motion. A vote***  
105 ***was taken all were in favor, the motion passed 5-0-0.***

106 Respectfully submitted,

107 Daniel Hoijer,  
108 Recording Secretary  
109 Via Exeter TV



# TOWN OF EXETER

## *Planning and Building Department*

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 • FAX 772-4709

[www.exeternh.gov](http://www.exeternh.gov)

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**Date:** April 6, 2023  
**To:** Planning Board  
**From:** Dave Sharples, Town Planner  
**Re:** Richard & Debbi Schaefer PB Case #23-3

The Applicant is seeking a minor subdivision of an existing 21-acre parcel located at 24 Powder Mill Road into two (2) residential building lots. The Applicant is proposing to subdivide off a 5-acre parcel with frontage on Powder Mill Road for a new single-family residence. The subject property is located in the R-1, Low Density Residential zoning district and is identified as Tax Map Parcel #102-4.

The Applicant submitted a minor subdivision plan and supporting documents, dated February 23, 2023 which are enclosed for your review.

The Applicant appeared before the Zoning Board of Adjustment, at their November 15<sup>th</sup>, 2022 meeting, and was granted a variance for relief from the requirement to provide the 24 inches to the seasonal high-water table for test pits for an individual sewage disposal system. A copy of the ZBA decision letter and minutes from that meeting are enclosed for your review.

There was no Technical Review Committee meeting, however, the plans were reviewed by staff for compliance with zoning and subdivision regulations. Code Enforcement Officer Doug Eastman has determined that the proposal meets the minimum dimensional requirements. However, the subject property is located within the special flood hazard area (AE Flood zone) and is subject to the recently adopted amendment to Article 9.4 Floodplain Development Ordinance (of the Town's Zoning Ordinance) which prohibits "*new or expansion of existing septic systems, except to correct malfunctions of the septic system.*" The Applicant's subdivision application was received in our office on February 23, 2023; this was after the 'posting' of the proposed amendment on December 28, 2022, but before the Town meeting vote on March 14, 2023. The Applicant has been advised that relief from the Zoning Board of Adjustment will be necessary for the proposed construction of a new individual sewage disposal system on the property. The Applicant has requested to move forward with the public hearing on their application and to discuss any further comments and/or concerns the Board may have.

I also spoke with Henry Boyd, the representative for the application, and he asked if the Planning Board could approve the subdivision with the condition that the applicant secures a variance from the floodplain ordinance. The Planning Board, at least during my time here has not approved any plan subject to subsequent relief from the ZBA. I do not believe this is good practice as it brings the Planning Board into the variance discussion by deciding on an application prior to the ZBA hearing. I have consulted with legal counsel and could provide the board with their opinion either at the public meeting or under the exception in NHRSA 91-A:3. II. (l) but I would suggest the latter.

That said, I do believe the Planning Board can start the process of reviewing the application, hold the public hearing, relay any initial concerns or comments the Board may have, and then table the application to a later date. This will allow the applicant to file an application for the next ZBA meeting and reappear before the Board in the event they are successful in securing relief.

There are no waivers being requested in conjunction with this application.

**Planning Board Motion:**

**Minor Subdivision Motion:** I move that the request of Richard and Debbi Schaefer (PB Case #23-3) for Minor Subdivision approval be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / TABLED / DENIED.

Thank You.

Enclosures





RECEIVED

EB 23 2023

TOWN OF EXETER  
MINOR SUBDIVISION, MINOR  
SITE PLAN, AND/OR LOT LINE  
ADJUSTMENT APPLICATION

EXETER PLANNING OFFICE

PH: date 4/13/23

OFFICE USE ONLY

THIS IS AN APPLICATION FOR:

- MINOR SITE PLAN
- MINOR (3lots or less) SUBDIVISION  LOTS
- LOT LINE ADJUSTMENT

APPLICATION	
DATE RECEIVED	
APPLICATION FEE	175.00
PLAN REVIEW FEE	
ABUTTER FEE	60.00
LEGAL NOTICE FEE	50.00
INSPECTION FEE	
TOTAL FEES	285.00
AMOUNT REFUNDED	

pd. 2/23/23 ✓ #7131

1. NAME OF LEGAL OWNER OF RECORD: RICHARD AND DEBBI SCHAEFER

ADDRESS: 24 POWDER MILL RD.

TELEPHONE: (603) 772-8637

2. NAME OF APPLICANT: SAME

ADDRESS: \_\_\_\_\_

TELEPHONE: ( ) \_\_\_\_\_

3. RELATIONSHIP OF APPLICANT TO PROPERTY IF OTHER THAN OWNER: \_\_\_\_\_

(Written permission from Owner is required, please attach.)

4. DESCRIPTION OF PROPERTY:

ADDRESS: 24 POWDER MILL RD.

TAX MAP: 102 PARCEL #: 4 ZONING DISTRICT: B-1

AREA OF ENTIRE TRACT: 21 ACRES PORTION BEING DEVELOPED: SEEK TO SUBDIVIDE OFF 5 ACRE LOT FOR DAUGHTER



5. EXPLANATION OF PROPOSAL: SEEK TO DIVIDE A 5 ACRE LOT OFF THIS 21 ACRE LOT FOR DAUGHTER TO BUILD A HOME

6. ARE MUNICIPAL SERVICES AVAILABLE? (YES/NO) NO  
IF YES, WATER AND SEWER SUPERINTENDENT MUST GRANT WRITTEN APPROVAL FOR CONNECTION. IF NO, SEPTIC SYSTEM MUST COMPLY WITH W.S.P.C.C. REQUIREMENTS.

7. LIST ALL MAPS, PLANS AND OTHER ACCOMPANYING MATERIAL SUBMITTED WITH THIS APPLICATION:

<u>ITEM:</u>	<u>NUMBER OF COPIES</u>
A. <u>(7) 22x34 PLAN COPIES</u>	
B. <u>(15) 11x17 PLAN COPIES</u>	
C. _____	
D. _____	
E. _____	
F. _____	

8. ANY DEED RESTRICTIONS AND COVENANTS THAT APPLY OR ARE CONTEMPLATED (YES/NO) NO IF YES, ATTACH COPY.

9. NAME AND PROFESSION OF PERSON DESIGNING PLAN:

NAME: HENRY H BOYD JR, US MILLENIUM ENGINEERING, INC  
ADDRESS: P.O. BOX 745 EXETER, NH 03833  
PROFESSION: LAND SURVEYOR TELEPHONE: 603 778-0528

10. LIST ALL IMPROVEMENTS AND UTILITIES TO BE INSTALLED: \_\_\_\_\_  
PROPOSED HOUSE, DRIVEWAY, WELL & SEPTIC  
\_\_\_\_\_



11. HAVE ANY SPECIAL EXCEPTIONS OR VARIANCES BEEN GRANTED BY THE ZONING BOARD OF ADJUSTMENT TO THIS PROPERTY PREVIOUSLY?

(Please check with the Planning Department Office to verify) (YES/NO) NO IF YES, LIST BELOW AND NOTE ON PLAN.

**NOTICE:**

I CERTIFY THAT THIS APPLICATION AND THE ACCOMPANYING PLANS AND SUPPORTING INFORMATION HAVE BEEN PREPARED IN CONFORMANCE WITH ALL APPLICABLE TOWN REGULATIONS, INCLUDING BUT NOT LIMITED TO THE "SITE PLAN REVIEW AND SUBDIVISION REGULATION" AND THE ZONING ORDINANCE. FURTHERMORE, IN ACCORDANCE WITH THE REQUIREMENTS OF THE "SITE PLAN REVIEW AND SUBDIVISION REGULATIONS", I AGREE TO PAY ALL COSTS ASSOCIATED WITH THE REVIEW OF THIS APPLICATION.

DATE 2/23/23

APPLICANT'S SIGNATURE

*Robert Schaefer*  
*Delli Schaefer TTEES*

ACCORDING TO RSA 676.4.I ( c ), THE PLANNING BOARD MUST DETERMINE WHETHER THE APPLICATION IS COMPLETE WITHIN 30 DAYS OF SUBMISSION. THE PLANNING BOARD MUST ACT TO EITHER APPROVE, CONDITIONALLY APPROVE, OR DENY AN APPLICATION WITHIN SIXTY FIVE (65) DAYS OF ITS ACCEPTANCE BY THE BOARD AS A COMPLETE APPLICATION. A SEPARATE FORM ALLOWING AN EXTENSION OR WAIVER TO THIS REQUIREMENT MAY BE SUBMITTED BY THE APPLICANT.



ABUTTERS: PLEASE LIST ALL PERSONS WHOSE PROPERTY IS LOCATED IN NEW HAMPSHIRE AND ADJOINS OR IS DIRECTLY ACROSS THE STREET OR STREAM FROM THE LAND UNDER CONSIDERATION BY THE BOARD. THIS LIST SHALL BE COMPILED FROM THE EXETER TAX ASSESSOR'S RECORDS.

TAX MAP 102-4  
 NAME RICHARD AND DEBBI SCHAEFER  
 ADDRESS 24 POWDER MILL RD.  
EXETER, NH 03833

TAX MAP 73-47  
 NAME BOSTON AND MAINE RAILROAD  
 ADDRESS 1700 IRON HORSE PARK  
NORTH BILLERICA, MA 01862

TAX MAP 102-5  
 NAME TOWN OF EXETER  
 ADDRESS 10 FRONT ST  
EXETER, NH 03833

TAX MAP \_\_\_\_\_  
 NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_

TAX MAP 102-6  
 NAME TOWN OF EXETER  
 ADDRESS 10 FRONT ST.  
EXETER, NH 03833

TAX MAP \_\_\_\_\_  
 NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_

TAX MAP 102-7  
 NAME THOMAS AND RENEE CREGAN  
 ADDRESS 19 POWDER MILL RD  
EXETER, NH 03833

TAX MAP \_\_\_\_\_  
 NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_

TAX MAP 102-3  
 NAME TOWN OF EXETER  
 ADDRESS 10 FRONT ST.  
EXETER, NH 03833

TAX MAP \_\_\_\_\_  
 NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_

TAX MAP 113-1  
 NAME TOWN OF EXETER  
 ADDRESS 10 FRONT ST.  
EXETER, NH 03833

TAX MAP \_\_\_\_\_  
 NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_

TAX MAP 113-4  
 NAME BRUCE AND TIMOTHY WHITE  
 ADDRESS 126 LINDEN ST.  
EXETER, NH 03833

TAX MAP \_\_\_\_\_  
 NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_

TAX MAP 97-23  
 NAME RIVERWOODS CO AT EXETER  
 ADDRESS 7 RIVERWOODS DR.  
EXETER, NH 03833

TAX MAP \_\_\_\_\_  
 NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_

**Please attach additional sheets if needed**



## CHECK LIST FOR MINOR SITE PLAN REVIEW, MINOR SUBDIVISION AND LOT LINE ADJUSTMENT

APPLICANT	TRC	REQUIRED EXHIBITS, SEE REGULATION 6.6.2.4
<input checked="" type="checkbox"/>	<input type="checkbox"/>	a) The name and address of the property owner, authorized agent, the person or firm preparing the plan, and the person or firm preparing any other data to be included in the plan.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	b) Title of the site plan, subdivision or lot line adjustment, including Planning Board Case Number.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	c) Scale, north arrow, and date prepared.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	d) Location of the land/site under consideration together with the names and address of all owners of record of abutting properties and their existing use.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	e) Tax map reference for the land/site under consideration, together with those of abutting properties.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	f) Zoning (including overlay) district references.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	g) A vicinity sketch showing the location of the land/site in relation to the surrounding public street system and other pertinent location features within a distance of 1,000-feet.
<input type="checkbox"/>	<input type="checkbox"/>	h) For minor site plan review only, a description of the existing site and proposed changes thereto, including, but not limited to, buildings and accessory structures, parking and loading areas, signage, lighting, landscaping, and the amount of land to be disturbed.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	i) If deemed necessary by the Town Planner, natural features including watercourses and water bodies, tree lines, and other significant vegetative cover, topographic features and any other environmental features which are significant to the site plan review or subdivision design process.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	j) If deemed necessary by the Town Planner, existing contours at intervals not to exceed 2-feet with spot elevations provided when the grade is less than 5%. All datum provided shall reference the latest applicable US Coast and Geodetic Survey datum and should be noted on the plan.
<input type="checkbox"/>	<input type="checkbox"/>	k) If deemed necessary by the Town Planner for proposed lots not served by municipal water and sewer utilities, a High Intensity Soil Survey (HISS) of the entire site, or portion thereof. Such soil surveys shall be prepared and stamped by a certified soil scientist in accordance with the standards established by the Rockingham County Conservation District. Any cover letters or explanatory data provided by the certified soil scientist shall also be submitted.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	l) State and federal jurisdictional wetlands, including delineation of required setbacks.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	m) A note as follows: "The landowner is responsible for complying with all applicable local, State, and Federal wetlands regulations, including any permitting and setback requirements required under these regulations."
<input checked="" type="checkbox"/>	<input type="checkbox"/>	n) Surveyed exterior property lines including angles and bearings, distances, monument locations, and size of the entire parcel. A professional land surveyor licensed in New Hampshire must attest to said plan.

NA



# Millennium Engineering, Inc.

P.O. Box 745  
(603) 778-0528

Exeter, NH 03833  
FAX (603) 772-0689

February 23, 2023

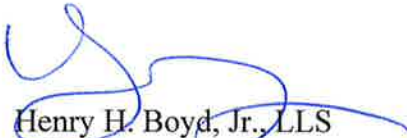
Town of Exeter  
Planning Board  
10 Front Street  
Exeter, NH 03833

Re: Application for Minor Map 102 Lot 4, 24 Powder Mill Road Exeter, NH.

Dear Chairman:

The request is made to divide a 5-acre lot off from this 21-acre parcel so that the applicant's daughter can build a new home. The proposed dwelling will have its own well and individual septic disposal system.

Respectfully,



Henry H. Boyd, Jr., LLS  
Millennium Engineering Inc.



TOWN OF EXETER, NEW HAMPSHIRE

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 • FAX 772-4709

[www.exeternh.gov](http://www.exeternh.gov)

November 16, 2022

Henry H. Boyd, Jr., LLS  
Millennium Engineering, Inc.  
13 Hampton Road  
POB 745  
Exeter, New Hampshire 03833

Re: Zoning Board of Adjustment Case #22-18 - Variance Request  
Richard & Debbi Schaefer, 24 Powder Mill Road, Exeter, N. H.  
Tax Map Parcel #102-4

Dear Mr. Boyd:

This letter will serve as official confirmation that the Zoning Board of Adjustment, at its November 15<sup>th</sup>, 2022, voted to grant the above-captioned application for a variance from Article 5, Section 5.3.3. to permit the use of test pits for an individual sewage disposal system with less than the required 24 inches to seasonal high-water table, as presented, subject to an Enviro-Septic pipe or similar system be installed.

Please be advised that in accordance with Article 12, Section 12.4 of the Town of Exeter Zoning Ordinance entitled "Limits of Approval" that all approvals granted by the Board of Adjustment shall only be valid for a period of three (3) years from the date such approval was granted; therefore, should substantial completion of the improvements, modifications, alterations or changes in the property not occur in this period of time, this approval will expire.

If you should have any questions, please do not hesitate to contact the Building Department office at (603) 773-6112.

Sincerely,

A handwritten signature in cursive script that reads "Kevin M. Baum".

Kevin M. Baum  
Chairman

Exeter Zoning Board of Adjustment

cc: ✓ Richard and Debbi Schaefer, property owners  
Douglas Eastman, Building Inspector/Code Enforcement Officer  
Janet Whitten, Town Assessor

KMB: bsm



Town of Exeter  
Zoning Board of Adjustment  
November 15, 2022, 7 PM  
Town Hall  
Final Minutes

I. **Preliminaries**

**Members Present:** Chair Kevin Baum, Laura Davies, Martha Pennell - Alternate

**Members Absent:** Vice-Chair Robert Prior, Clerk Esther Olson-Murphy, Joanne Petito - Alternate, Dave Mirsky - Alternate

**Call to Order:** Chair Baum called the meeting to order at 7:07 PM. He asked for a moment of silence for Rick Thielbar, who passed away this week.

I. **Continuances**

A. The application of RiverWoods Company of Exeter for a variance from Article 2, Section 2.2.26, Definition of "Elderly Congregate Health Care" to permit skilled nursing care off site on related campus. The subject property is located at 7 RiverWoods Drive in the R-1, Low Density Residential zoning district. Tax Map Parcel #97-23. ZBA Case #22-15

B. The application of RiverWoods Company of Exeter for a variance from Article 2, Section 2.2.26, Definition of "Elderly Congregate Health Care Facilities" to permit skilled nursing care off site on related campus. The subject property is located at 5 Timber Lane, in the R-1, Low Density Residential zoning district. Tax Map Parcel #98-37. Case #22-16.

Ms. Davies made a motion to continue the hearing on cases #22-15 and #22-16 to December 20, 2022 at the applicant's request. Ms. Pennell seconded. The motion passed 3-0.

C. ZBA Case 22-16. The application of 107 Ponemah Road LLC for a special exception per Article 4, Section 4.2, Schedule I: Permitted Uses and Article 5, Section 5.2 to permit the conversion of the existing single-family dwelling and attached barn located at 50 Linden Street to a three-family home. The subject property is situated in a R-2, Single Family Residential zoning district. Tax Map Parcel #82-11. ZBA Case #22-17.

Ms. Davies moved to continue the hearing for case #22-17 to January 17, 2023 at the applicant's request. Ms. Pennell seconded. The motion passed 3-0.

D. The application of Jewett Construction Co., LLC (on behalf of Craig Jewett) for a special exception per Article 4, Section 4.2 Schedule I: Permitted Uses and Article 5, Section 5.2 for a change of use to permit the existing church on the property at 12 Little River Road to be used as a Montessori Early Childhood

44 Education Center. The subject property is located in the R-2, Single Family  
45 Residential zoning district. Tax Map Parcel #62-90. ZBA Case #22-20.

46 Ms. Davies moved to continue the hearing for case #22-20 to December 20, 2022 at the  
47 applicant's request. Ms. Pennell seconded. The motion passed 3-0.

48  
49 **II. New Business**

- 50  
51 A. The application of Richard and Debbi Schaefer for a variance from Article 5,  
52 Section 5.3.3. to permit the use of test pits for an individual sewage disposal  
53 system with less than the required 24 inches to seasonal high-water table. The  
54 subject property is located at 24 Powder Mill Road, in the R-1, Low Density  
55 Residential zoning district. Tax Map Parcel #102-4. ZBA Case #22-18.

56 Henry Boyd of Millennium Engineering spoke on behalf of the Schaefers,  
57 who were also present.

58 Mr. Boyd said the Schaefers are trying to give their daughter a piece of  
59 land to keep the family together. Their parcel is 17 acres. He presented Tax Map  
60 102 and a wetland delineation sketch from the wetland scientist for the Board's  
61 reference.

62 Mr. Boyd said that Exeter has an overreaching requirement for septic.  
63 Normally septic needs 6 inches of existing natural soil above the high water  
64 table, but Exeter requires 24 inches. This parcel has between 10 and 17 inches,  
65 about 7 inches short of what's required. This requirement is not necessarily  
66 scientific. We could add fill above the naturally occurring soil, which we will have  
67 to do anyway to get to the 4 total feet from the seasonal water table required for  
68 the septic system. This variance won't create any problems for the town or river,  
69 but will provide a benefit for the applicant.

70 Mr. Baum said this project will also need a permit from NH DES. From a  
71 quick read of the State regulations, do they require 2-4 feet? Mr. Boyd said when  
72 you design the septic system, the State allows 2 feet from the septic to the water  
73 table when using certain technologies. The standard leach field is four feet, but  
74 newer technologies allow a reduction in the size and the distance from the water  
75 table. The first permit required from DES is a subdivision approval, since there is  
76 no sewer. We have to calculate the lot loading based on the soils. The applicants  
77 would have to prove to NH that there is enough soil to support a house, before  
78 they will grant the permit. Then we go to the Planning Board for approval for the  
79 subdivision, then back to DES for the septic design.

80 Mr. Baum asked what type of system would be 2 feet from the water  
81 table. Mr. Boyd said the applicant would likely use Enviro-Septic. We would not  
82 take a reduction in the distance to the water table, but more in the size. Looking  
83 at test pits, the soils here are slower. The 2 foot separation is for the septic itself.  
84 In Exeter, there must be 2 feet natural soil plus the allowance to the septic, for a  
85 total of 4 feet. If approved, we will design a system that will not harm the  
86 environment.

87 Ms. Davies asked about the proposal for the subdivision. Mr. Boyd said  
88 we haven't spent any survey money at this point, only done test pits and the  
89 delineation on the tax map. There's a tree line and driveway. He pointed out on  
90 the map where the house would likely be, but it depends on how much land the  
91 subdivision could be. We would have to meet setbacks from the structures and  
92 wetlands.

93 Mr. Schaefer presented a sketch of the proposed lot, which the Board  
94 reviewed. Mr. Boyd said he would encourage the applicants to share the  
95 driveway between parcels to minimize impacts, but if the State determined it was  
96 acceptable, there's an area for a separate driveway.

97 Ms. Pennell said she doesn't understand why Exeter's regulations are an  
98 issue. Mr. Eastman said it's been an issue before, in the same area, on Linden  
99 Street. 20 years ago, the Conservation Commission wanted to subdivide a piece  
100 of land to sell as a house lot, and they couldn't meet the 24 inches. They were at  
101 10 inches or so. They were granted a variance. Mr. Eastman said he doesn't  
102 know why it's 24 inches. There should be a relief valve when you make  
103 something more restrictive than the state.

104 Mr. Baum said the technology has improved since the regulations were  
105 made. Rye has similar requests frequently. State regulations have moved faster  
106 than the local. Would the applicants consider the condition of using the Enviro-  
107 Septic system? It will probably will have to happen regardless. Mr. Boyd said we  
108 use that system 98% of the time.

109 Mr. Boyd said that one of the reasons for the difference in regulations is  
110 that Exeter has sewer through most of the community, so it doesn't come up that  
111 frequently. If there's no scientific or public health reason to deny it, the Board  
112 should grant the variance so that the applicants can use their property.

113 Mr. Baum said the application contains the variance criteria.

114 Mr. Baum asked if any members of the public would like to speak, but  
115 there was no comment. He closed public comment and the Board entered into  
116 deliberations.

117 Ms. Pennell said her concern was that when there were hurricanes in  
118 Florida, you heard that people should not have built where they built. The  
119 applicants are asking to build where someone says they don't have enough  
120 depth. Mr. Baum said it's not the State saying that, it's the town, which is more  
121 restrictive. The Planning Board here probably does not revisit septic  
122 requirements often. The applicant's next step is to go to DES for subdivision  
123 approval and design approval, so the experts in this field will review it. The  
124 applicants will also go before the Planning Board for subdivision approval. Ms.  
125 Davies added that they'll look at floodplain issues during the subdivision  
126 approval.

127 Mr. Eastman said regarding the 24", there are smaller lots of record  
128 available in the town, as small as 1 acre. We want to make sure that on a small  
129 lot there's a good drainage area. This lot will be in excess of 5 acres, so there's  
130 plenty of room.

131 Ms. Davies said it sounds like there are other safeguards in place. She  
132 takes environmental issues seriously, but this should be an ok area.

133 Ms. Davies made a motion to approve the application of Richard and Debbi Schaefer for  
134 a variance from Article 5, Section 5.3.3. to permit the use of test pits for an individual  
135 sewage disposal system with less than the required 24 inches to seasonal high-water  
136 table, on the condition that an Enviro-Septic Pipe or similar system is used. Ms. Pennell  
137 seconded. The motion passed 3-0.

- 138  
139 B. The application of John Luke Rogers for a special exception per Article 4,  
140 Section 4.2 Schedule I: Permitted Uses, Schedule I Notes 2. and Article 5,  
141 Section 5.2 to permit an existing "in-law" unit to become an accessory dwelling  
142 unit. The subject property is located at 29 Hampton Road, in the R-2, Single  
143 Family Residential zoning district. Tax Map Parcel #87-23-3. ZBA Case #22-19.  
144

145 Mr. Rogers said he and his wife Stacy live at 29 Hampton Road. In the  
146 backyard is an accessory dwelling unit, which is approved as an in-law or guest  
147 suite. He is applying for a special exception to authorize the space as a rental  
148 property. Rental economics are dynamic right now. NH has high occupancy  
149 rates. This space, which is sitting idle, could be beneficial to the town and to us.  
150 This is a converted pool house, and the pool has been filled in. The proposed  
151 use is to rent it out on an intermediate or long-term basis.

152 Mr. Baum asked about the driveway on the map included with the  
153 application. Mr. Rogers said it's a shared drive; 29 has a driveway in front of the  
154 house which is connected to the driveway for 31. The house in the back is off of  
155 the shared driveway. The deed shows the right of way.

156 Ms. Davies said if they want it to become an accessory dwelling unit, the  
157 owner has to occupy one of the two units. Mr. Rogers agreed. Mr. Eastman said  
158 he went through all of that with the applicants. The driveway is tricky, since it's an  
159 easement for a driveway on Hunter Place.

160 Ms. Pennell asked if the applicants converted this from a pool house. Mr.  
161 Rogers said we only moved in a year ago, but our understanding is that there  
162 was formerly a pool that has been filled in. This in-law suite was converted years  
163 ago. Mr. Eastman said it was all permitted, a previous owner filled in the pool and  
164 renovated the pool house into a guest house. It was part of a four-lot subdivision  
165 around the year 2000.

166 Mr. Baum said it sounds like the property meets the accessory dwelling  
167 unit requirements. Ms. Pennell asked if the applicant will have to file with the  
168 Registry, and Mr. Eastman said the Building Department will do a Certificate of  
169 Occupancy and the applicant will be required to amend his deed.

170 Mr. Baum asked if his plans would include short-term rentals. Mr. Rogers  
171 said no, he spoke with Mr. Eastman and it won't be short-term.

172 Mr. Rogers went through the special exception criteria. A) The use is a  
173 permitted special exception as set forth in Article 4.2, Schedule 1; yes, the R2  
174 special exception includes accessory dwelling units. We plan to rent it out as an

175 ADU. B) That the use is so designed, located and proposed to be operated that  
176 the public health, safety, welfare, and convenience would be protected; yes,  
177 that's at the forefront of our intentions. Our family lives on the property. C) That  
178 the proposed use will be compatible with the zoned district and adjoining post-  
179 1972 development where it is to be located; yes. D) That adequate landscaping  
180 and screening are provided; yes, the property is set back from Hampton Road. E)  
181 That adequate off-street parking is provided; yes, plenty of parking is available.  
182 F) That the use conforms with all applicable regulations governing the district  
183 where located; yes. G) The applicant may be required to obtain Planning Board  
184 or Town Planning approval; yes, we will comply with anything that the ZBA  
185 deems necessary. H) That the use shall not adversely affect abutting or nearby  
186 property values; yes, this will be a good thing overall for the immediate area and  
187 the town. He added that I) and J) are not applicable for the ADU use.

188 Mr. Baum opened the discussion to the public, but there was no  
189 comment. He closed the public session and entered into Board deliberations.

190 Mr. Baum asked Mr. Rogers to send Mr. Eastman a copy of the deed. Mr.  
191 Eastman said we can download it without him sending it.

192 Ms. Davies said this is very straightforward. It's an existing building legally  
193 put into use as a residence, but not as a legal separate unit for rental. It meets all  
194 ADU criteria. There will be no physical change to the property. She has no  
195 concerns.

196 Ms. Pennell said she has no issues.

197 Mr. Baum said the access didn't make sense to him at first, but it sounds  
198 like there's an easement.

199 Ms. Davies made a motion to approve the application of John Luke Rogers for a special  
200 exception per Article 4, Section 4.2 Schedule I: Permitted Uses, Schedule I Notes 2 and  
201 Article 5, Section 5.2 to permit an existing "in-law" unit to become an accessory dwelling  
202 unit at 29 Hampton Road. Mr. Baum seconded. [not voted]

203  
204 Ms. Pennell questioned the use of the term "in-law." Mr. Eastman said it could be  
205 referred to as an "accessory structure" instead.  
206

207 Ms. Davies moved to change her motion to use the term "accessory structure" instead of  
208 "in-law unit" in the previous motion: "to permit an existing accessory structure to become  
209 an accessory dwelling unit at 29 Hampton Road." Mr. Baum seconded the amended  
210 motion. The amended motion passed 3-0.

211

212

213 **III. Other Business**

214 A. Minutes of September 20, 2022

215 Corrections: Ms. Pennell said in the "Members Absent" section, Chris Merrill was  
216 not a ZBA member at that time. Mr. Baum said Dave Mirsky was a member,  
217 although he was not present.

218 Ms. Davies was not present at the 9/20 meeting, so there was not a quorum to  
219 vote. The minutes were tabled until the December meeting.

220

221 **IV. Adjournment**

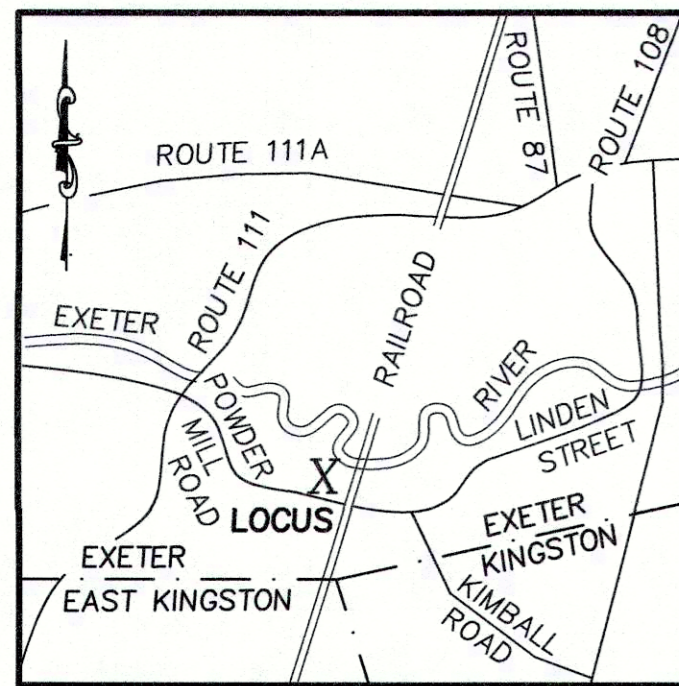
222 Ms. Davies moved to adjourn. Mr. Baum seconded. All were in favor and the meeting was  
223 adjourned at 8:05 PM.

224

225 Respectfully Submitted,

226 Joanna Bartell

227 Recording Secretary



**REMAINING AREA**  
16 ± ACRES

SEE LOMR 18-01-0144P  
EFFECTIVE: 11-05-2018.

**NOTES:**

- 1) THIS PLAN DOES NOT SHOW ANY UNRECORDED OR UNWRITTEN EASEMENTS WHICH MAY EXIST. A REASONABLE AND DILIGENT ATTEMPT HAS BEEN MADE TO OBSERVE ANY APPARENT VISIBLE USES OF THE LAND; HOWEVER, THIS DOES NOT CONSTITUTE A GUARANTEE THAT NO SUCH EASEMENTS EXIST.
- 2) THIS PARCEL LIES PARTIALLY WITHIN AE FLOOD ZONE, 0.2% ANNUAL FLOOD CHANCE ZONE AND THE REGULATORY FLOOD WAY. SEE F.I.R.M. COMMUNITY PANEL 330135C 0403 E EFFECTIVE DATE MAY 17, 2005.  
SEE LOMR 18-01-0144P EFFECTIVE: 11-05-2018.
- 3) "THE LANDOWNER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL WETLANDS REGULATIONS, INCLUDING ANY PERMITTING AND SETBACKS REQUIRED UNDER THESE REGULATIONS."
- 4) ELEVATIONS ARE BASED ON NAVD29.
- 5) PROPOSED HOME MUST BE BUILT TO PLAIN DEVELOPMENT ORDINANCE 9.4 WITHIN THE TOWN ZONING REGULATIONS.

TOWN OF EXETER PLANNING BOARD  
CHAIRMAN \_\_\_\_\_ DATE \_\_\_\_\_

**RECORD OWNERS**

SCHAEFER FAMILY REV. TRUST  
RICHARD C. & DEBBI L. SCHAEFER TRUSTEES  
24 POWDER MILL ROAD  
EXETER, NH 03833  
BK. 4329 PG. 1795  
21± ACRES  
PER DEED

**PLAN NOTE**

THE PURPOSE OF THIS PLAN IS TO SHOW THE DIVISION OF THIS PARCEL INTO 2 LOTS FOR SINGLE FAMILY RESIDENTIAL PURPOSES.

**VARIANCE NOTE**

SEE VARIANCE CASE #22-18 NOVEMBER 15, 2022 TO PERMIT THE USE OF TEST PITS FOR INDIVIDUAL SEPTIC DISPOSAL SYSTEM WITH LESS THAN 24" TO SEASONAL HIGH WATER TABLE. SUBJECT TO ENVIRO-SEPTIC OR SIMILAR SYSTEM TO BE INSTALLED.

**PLAN REFERENCES**

D-32415 C-11567 D-10095  
SEE RAILROAD VAL. PLAN V2NH/47

73  
47

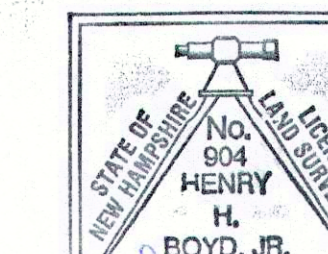
N/F  
BOSTON & MAINE RAILROAD  
1700 IRON HORSE PARK  
NORTH BILLERICA, MA 01862

THE CERTIFICATIONS SHOWN HEREON ARE INTENDED TO MEET REGISTRY OF DEEDS REQUIREMENTS AND ARE NOT A CERTIFICATION TO TITLE OR OWNERSHIP OF PROPERTY SHOWN. OWNERS OF ADJOINING PROPERTIES ARE ACCORDING TO CURRENT TOWN/CITY ASSESSORS' RECORDS.

I CERTIFY:  
THAT THIS ACTUAL SURVEY WAS MADE ON THE GROUND IN JANUARY 2023.

THAT THIS PLAN CONFORMS TO THE RULES AND REGULATIONS OF REGISTER OF DEEDS.

THAT THIS SURVEY CONFORMS TO THE REQUIREMENTS FOR ACCURACY FOR N.H. URBAN SURVEY.



LICENSED LAND SURVEYOR  
DATE 02-23-2023

PLANNING BOARD CASE NUMBER 23-XX

**PLAT OF LAND**  
IN  
EXETER, NH

SHOWING  
A MINOR SUBDIVISION  
AT 24 POWDER MILL ROAD  
(ASSESSORS MAP 102 LOT 4)

RECORD OWNER  
SCHAEFER FAMILY TRUST  
RICHARD C. & DEBBI L. SCHAEFER TRUSTEES  
24 POWDER MILL ROAD EXETER, NH 03833

**MILLENNIUM ENGINEERING INC.**  
ENGINEERS AND LAND SURVEYORS  
P.O. BOX 745 13 HAMPTON ROAD EXETER, NH 03833  
PHONE: (603) 778-0528 FAX: (603) 772-0689

**WETLANDS DELINEATION BY**  
GOVE ENVIRONMENTAL, INC.  
8 CONTINENTAL DRIVE UNIT H  
EXETER, NH 03833

IN ACCORDANCE WITH THE U.S. ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, TECHNICAL REPORT Y-87-1 (JANUARY, 1987); REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTH-CENTRAL AND NORTHEAST REGION (OCTOBER 2012); NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE'S "FIELD INDICATORS OF IDENTIFYING HYDRIC SOILS IN NEW ENGLAND," VERSION 4, 2017; CODE OF ADMINISTRATIVE RULES. NHDES WETLANDS BUREAU (CURRENT).

N/F  
TOWN OF EXETER  
10 FRONT STREET  
EXETER, NH 03833  
BK. 1500 PG. 0347

**ZONING DISTRICT**

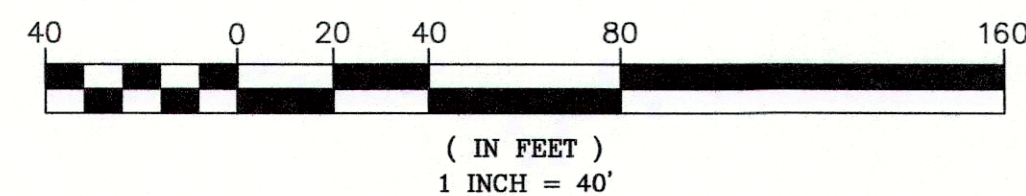
R-1 LOW DENSITY

AREA	2 ACRES
WIDTH	150'
DEPTH	150'
FRONTAGE	150'
BUILDING HEIGHT	35'
BUILDING SETBACKS	
FRONT	25'
SIDE	15'
REAR	25'
BUILDING COVERAGE	
MAXIMUM	15%
OPEN SPACE	
MINIMUM	80%

**LEGEND**

- I.P. IRON PIPE
- I ROD IRON ROD
- FND. FOUND
- ASSESSORS MAP AND PARCEL
- OHW OVER HEAD WIRE
- UTILITY POLE
- WETFLAG
- WETLAND

**GRAPHIC SCALE**



NO.	DATE	DESCRIPTION	BY	SCALE: 1"=40'	CALC. BY: R.S.G.	PROJECT: E222977
				DATE: FEB. 23, 2023	CHKD. BY: H.H.B.	



# TOWN OF EXETER

## *Planning and Building Department*

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 • FAX 772-4709

[www.exeternh.gov](http://www.exeternh.gov)

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**Date:** April 6, 2023  
**To:** Planning Board  
**From:** Dave Sharples, Town Planner  
**Re:** C/A Design, Inc. - Wakefield Thermal PB Case #23-4

The Applicant is seeking site plan approval for the proposed construction of a 40,000 square foot addition to the existing industrial building at 131 Portsmouth Avenue (former OSRAM Sylvania property). The subject property is located in the CT-Corporate Technology and C-2 Highway Commercial zoning districts. Tax Map Parcel #52-112.

The Applicant has submitted a site plan review application, plans and supporting documents, dated February 28, 2023 for review. A Technical Review Committee (TRC) meeting was conducted on March 23, 2023. A copy of the TRC comment letter, dated March 24, 2023 and UEI comment letter, dated March 24, 2023 are also enclosed for your review.

Revised plans and supporting documents (including revised narrative, TRC & UEI response comment letters) were received on March 31<sup>st</sup>, 2023 and are enclosed for your review. A second UEI comment letter, dated April 6, 2023 is also enclosed. Staff is in the process of reviewing this submission to determine if all the TRC and UEI comments have been addressed and I will update the board at the meeting.

The Applicant obtained a variance from the Zoning Board of Adjustment at its September 20<sup>th</sup>, 2022 meeting to permit the proposed expansion of the existing, non-conforming light industry use on the property. A copy of the ZBA decision letter and meeting minutes are enclosed for your review.

The Applicant appeared before the Conservation Commission, at their February 21<sup>st</sup>, 2023 meeting for review of the letter from Certified Wetland Scientist Jay Aube, dated February 14, 2023 (included in the application materials) and their NH DES Expedited Wetlands Permit application. The Commission voted to endorse the filing and also provided additional comments, unrelated to the wetlands impact, that they wanted to convey to the Planning Board for their review. Please see the attached e-mail from Kristen Murphy, dated March 23, 2023 (forwarded message from Andrew Koff to Dave Sharples, 2/23/23). No Conditional Use Permit (CUP) is needed even though wetlands will be impacted. All of these wetlands have been identified by the wetland scientist as man-made as described in the wetland report. Man-made wetlands are not subject to our buffer or CUP requirements.

There are no waivers being requested in conjunction with the application.



In the event the board chooses to hold a site walk, I will ask the applicant to mark out the important features of the site. I will be prepared with suggested conditions of approval at the meeting in the event the board decides to act on the request and forego a site walk.

**Planning Board Motion:**

**Site Plan Motion:** I move that the request of C/A Design, Inc. - Wakefield Thermal (PB Case #23-4) for Site Plan approval be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / TABLED / DENIED.

Thank You.

Enclosures

# TOWN OF EXETER

## *Planning and Building Department*

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 • FAX 772-4709

[www.exeternh.gov](http://www.exeternh.gov)

---

**Date:** March 24, 2023

**To:** Tom Burns, P.E., TF Moran, Inc.  
Matt Van Zile, C/A Design, Inc. (Wakefield Thermal)

**From:** Dave Sharples, Town Planner

**Re:** Site Plan Review TRC Comments - PB Case #23-4  
C/A Design, Inc. (Wakefield Thermal) 131 Portsmouth Avenue  
Tax Map Parcel #52-112

The following comments are provided as a follow-up for technical review of the site plans and supporting documents submitted on February 28, 2023 for the above-captioned project. The TRC meeting was held on Thursday, March 23<sup>rd</sup>, 2023 and materials were reviewed by Town departments.

### **TOWN PLANNER COMMENTS**

1. Are there any known environmental hazards onsite? Have any environmental studies been completed and, if so, please provide copies;
2. Provide location of significant trees per Section 7.4.7. If none are present, please state that on the plan;
3. Monumentation shall be set in accordance with Section 9.25;
4. The Existing Conditions plan shows a 15 foot-wide "Water Works Easement" across the southern part of the site. Please provide a copy of said easement to determine what will happen if this area needs to be excavated in the future;
5. Consult with Exeter Fire Department regarding fire hydrant location and knox box. Revise plans if needed;
6. Section 9.2.3 of the regulations state that the "architectural design guidelines may apply to industrial buildings." This will be discussed by the Planning Board but it does not appear that this building will be visible from any public right-of-way and, even if parts of it are, it will be a considerable distance away;
7. Explain how the stormwater will (or will not) impact surrounding properties or wetland areas;
8. Did a landscape architect choose the landscape species? If so, were they chosen based on soil and environmental conditions to insure the best chance of survival?
9. The Planning Board may conduct a site walk. In preparation for the site walk, at a minimum, the applicant should clearly mark where all the buildings and parking areas will be located. In other words, it should be easy for the board to understand where the buildings will be and where traffic will flow through the site.

10. Show snow storage areas on plans to insure they do not conflict with landscaping/utilities and drainage structures, etc.;
11. Electric Vehicle (EV) charging readiness; and
12. Will the 18' gravel access drive be maintained year-round? Place note on plans.

### **PUBLIC WORKS COMMENTS**

Please see Underwood Engineers, Inc. (UEI) comment letter, dated March 24, 2023.

### **FIRE DEPARTMENT COMMENTS**

Basic requirements of the Exeter Fire Department. This list is not all inclusive and other requests may be made during the review process. Unless specifically required by code, some room for compromise is open.

#### **(Rev 5: 9/7/2017) Architectural Review:**

- Interior utility room access
- Interior sprinkler room access
- Adequate attic access (sized for FF, if applicable))
- Catwalk access in unfinished areas that have sprinklers (handrails preferred)
- If building has truss roof or floors, must display sign according to ordinance 1301. Knox box required for all buildings with fire alarm or sprinkler systems (ordinance 1803)

#### **Civil/Site Review:**

- Hydrant near site access and towards rear of site (if applicable)

#### **Sprinkler Review:**

- NFPA 13(R,D) sprinkler system where required
- FDC: 4-inch storz with at least 18" clearance to ground
- Electric bell (no water motor gong)
- Attic protection in 13R systems

#### **Fire Alarm Review:**

- Single red beacon or strobe indicator on exterior (not horn-strobe)
- NFPA72 Fire Alarm System where required
- Cat 30 keys for pull stations and FACP

#### **Elevators:**

- Heat and smoke top and bottom (heats for the shunt trip)
- Dimensions to accommodate a stretcher (usually a 2500 lbs) 3'6" by 7' at a minimum
- Elevator recall to appropriate floor during an activation

- Sprinkler protection top and bottom if ANY combustible material in shaft. (can omit per NFPA 13 guidelines)
- Phone in car needs to be able to dial 911

#### **NATURAL RESOURCE PLANNER COMMENTS**

Applicant attended the February 21<sup>st</sup>, 2023 Conservation Commission meeting – Expedited wetland application was approved and signed. The following additional comments were offered for Planning Board consideration:

- Invasive species management plan: there are documented invasive plant species onsite and a plan should be developed to prevent further spread of these plants during and after construction activities.
- Stormwater management: we discussed the close proximity of the site to the Town's surface water supply (Dearborn Reservoir) . Due to this, proper management of stormwater during and after construction is paramount. We discussed the existing and proposed stormwater system and want to ensure that the Water Department is aware of this proposal and has an opportunity to comment on the design. We want to ensure that any stormwater leaving the site is treated using best available technology and does not impact the reservoir.

In order to be heard at the April 13<sup>th</sup>, 2023 Planning Board meeting, please submit any revised plans along with a letter responding to these comments (and other review comments, if applicable) **no later than Friday, March 31, 2023**, but sooner if possible, to allow staff adequate time to review the revisions and responses prior to the planning board hearing.

2932.00

March 24, 2023

David Sharples, Town Planner  
Town Planning Office, Town of Exeter  
10 Front Street  
Exeter, NH 03833

**Re: Wakefield Thermal / C/A Design Building Expansion  
Design Review Engineering Services  
Exeter, New Hampshire**

**Site Information:**

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Tax Map/Lot#:	52 / 112A
Address:	131 Portsmouth Avenue
Lot Area:	9 Acres
Proposed Use:	Industrial
Water:	Town
Sewer:	Town
Zoning District:	C-2 and CT
Applicant:	C/A Design
Design Engineer:	TFMoran

Review No. 1
--------------

**Application Materials Received:**

- Site plan set entitled “Building Expansion” dated February 26, 2023 prepared by TFMoran.
- Site plan application materials prepared by TFMoran.
- Miscellaneous materials prepared by TFMoran.
- Stormwater calculations and stormwater maintenance manual prepared by TFMoran.

Dear Mr. Sharples:

Based on our review of the above information, in addition to comments provided by the Town, we offer the following comments in accordance with the Town of Exeter Regulations and standard engineering practice.

General

1. It should be noted that a 10” water main runs through the Town of Exeter Water Works easement as depicted on sheet C2. The easement should be shown on all plans in the set.
2. Floor drains must be registered with the NHDES.
3. Since this project classifies as Industrial, the Applicant should be directed to contact Steve Dalton at the Town of Exeter DPW regarding industrial discharge to the Town’s system.

Site Plan

4. If equipment pads will be required (e.g. HVAC, transformers, additional generator, etc.), show the pads on the plan.
5. Provisions for an electric vehicle charging station is required per the Town of Exeter regulations.
6. We recommend installation of bollards to protect the existing hydrant on the north side of the existing building.

Utility Plan

7. Label sewer pipe slopes, size, and material.
8. Some of the sewer structures are approximately 13'–14' deep. ESHWT should be determined, and as appropriate, buoyancy of the structures should be evaluated.
9. Existing SMH 3494 lists two incoming pipes where only one is shown.
10. The water and sewer service on the northwestern side of the building do not appear to be separated by 10'.
11. Label the size and material of the proposed water lines.
12. An existing water line runs offsite under the southern entrance from GTE Drive. It is unclear where this water line goes or what parcel it services.
13. It is unclear what the orphaned valves located near CBs 11 and 20 service. If they are no longer in use, please label them as abandoned.
14. The 10" CI water main within the Town of Exeter Water Works easement should be located and shown on the plans. What measures are being proposed to protect the water main during construction? Amend plans as appropriate.
15. A proposed (S5) light pole is shown in the middle of the Town of Exeter Water Works easement. This placement appears imprudent.
16. Notes:
  - Note 3: It should be noted that the Town of Exeter is not a member of Dig Safe.
  - Note 10 should be removed.
  - A note should be added to indicate the site contractor must obtain an Exeter utility pipe installer's license and the job supervisor or foreman must be certified by the Town prior to working on any Town-owned water, sewer or drainage pipes or utilities that will connect or may connect to any Town-owned water, sewer, or drainage system. A licensed supervisor or foreman must be present at the job site at all times during construction of these utilities.

Grading and Drainage Plans

17. The underground detention system is in direct conflict with the existing 10" water main within the Town of Exeter's Water Works easement.
18. DMH 23 lists 2 pipe inverts where 3 are shown.
19. The existing inlet pipe into DMH 28 from the outlet structure of the pond is listed as 12" HDPE on the existing conditions plan and as 15" on other plans.



20. Provide information on the age and condition of the existing 36" CMP at the tie-in point with DMH 29. The 4" PVC pipe daylighting at the headwall appears likely to be an underdrain, does the proposed project require similar underdrain?
21. Indicate tie-ins to the drainage system from foundation drains and roof drains.
22. The three existing drain manholes in the southern corner of the site that discharge to the wetland are not labeled. A label should be added to the northernmost structure to indicate the cover may need to be raised or lowered to match the finished grade.

#### Landscape Plan C-7

23. Proposed plantings within the Water Works easement should be carefully evaluated and possibly removed.
24. Subsurface utilities should be shown on the plan to determine conflicts.

#### Stormwater Management Plan

25. A concrete washout pit should be indicated.

#### Detail Sheets

26. The Isolator Row detail on sheet C-17:
  - Sump depth is deferred to the site design engineer. Revise this note to indicate the sump depth proposed.
  - A note on the detail recommends inserts in upstream structures with open grates. It is not clear if these inserts will be installed.
27. Add the following details:
  - Lined concrete washout area.
  - Grease interceptor, if applicable.
  - Equipment pads for exterior HVAC units, transformer, etc. as applicable.

#### Stormwater Design and Modeling

Please note a full review of the stormwater calculations was not performed, as we defer to AoT comments pertaining to the calculations.

28. The rainfall amounts must be increased by 15% per AoT regulations Env-Wq 1503.08(1).
29. ESHWT and depth to ledge information should be provided in the area of the Stormtech system. Please provide test pit logs if available.
30. Provide pollutant removal calculations to show compliance with Town of Exeter removal requirements for nitrogen, phosphorous, and TSS.
31. The Stormtech outlet structure doesn't have any structure notes, i.e., Rim, Inverts?
32. DMH 26 only depicts two pipe inverts when three pipes are present.
33. The total runoff volume from the site increases by approximately 36,000 CF during the 50-year storm. Please address the increase in quantity in the narrative.



Page 4 of 4  
David Sharples  
March 24, 2023

**34. PTAP Database: This project requires registration with the PTAP Database.** The Applicant is requested to enter project related stormwater tracking information contained in the site plan application documents using the Great Bay Pollution Tracking and Accounting Program (PTAP) database ([www.unh.edu/unhsc/ptapp](http://www.unh.edu/unhsc/ptapp)) and submit the information with the resubmitted response to comments.

A written response is required to facilitate future reviews. Please contact us if you have any questions.

Very truly yours,

UNDERWOOD ENGINEERS, INC.

Allison M. Rees, P.E.  
Project Manager



Robert J. Saunders, P.E.  
Senior Project Engineer





## Project Narrative

*Revised 3/31/23*

C/A Design, Inc. (Applicant), a sister company to Wakefield Thermal, Inc., is proposing to renovate and expand the existing vacant manufacturing warehouse at 131 Portsmouth Avenue, being Tax Map 52, Lot 112A. The site is located on GTE Drive in Exeter, adjacent to the existing OSRAM building and Hannaford Super Market. Approximately 9 +/- acres, the property spans two zoning districts: 1) The Corporate/Technology Park (CT) and the Highway Commercial (C-2). The property is abutted by those zoning districts, CT to the Southeast (OSRAM) and C-2 to the Northwest (Hannaford).

As part of the expansion of the existing building, the Applicant is planning to construct a 200' x 200' one-story addition to the existing manufacturing warehouse (one-story with partial mezzanine/second level), for the purpose of providing brazed compact heat exchangers, CNC machined products and engineering services for the Defense Industry. The existing building would be renovated as part of this project.

In addition to the proposed building expansion, the Applicant proposes to replace the existing parking area on the site, providing accommodations for up to 150 employees. A new entrance drive would be located in the approved curb cut along Holland Way, providing access and circulation through the site and to the new loading area to be located along the southwest side of the building addition. This new entrance is intended to help reduce traffic turning movements at GTE Drive and Portsmouth Avenue.

Existing sewer, water, electric and drainage utilities would be relocated to accommodate the new construction, routed around the building and tying into existing downstream structures. A new utility easement is being proposed for relocation of sewer and drain lines discharging flows from the adjacent OSRAM site. A closed drainage system is being proposed for the development, comprised of a Stormtech subsurface detention system, (2) Contech Jellyfish pretreatment units, associated catch basins and conveyance practices to provide pretreatment, treatment, and attenuation of flows related to on-site stormwater management. The project proposes no increase in stormwater flow rates in any of the analyzed storm events as well as no increase in stormwater volume in the 2-year event, as per Town of Exeter and NHDES Alteration of Terrain requirements. Additionally, the use of the proposed Stormtech system and Contech Jellyfish units provides for a minimum of 80% TSS removal and 60% Total Phosphorous and Total Nitrogen removal per Town of Exeter stormwater treatment requirements.

As part of the proposed expansion, four man-made wetland areas on the site are proposed to be filled. These areas are drainage ditches, constructed during prior site development to capture stormwater runoff from the existing building and parking areas. As part of the site plan application submittal, a letter from a Certified Wetland Scientist has been included, identifying these wetlands as man-made in nature. The Exeter Conservation Commission, at their February 21, 2023 meeting, reviewed this letter and

the accompanying NHDES Dredge & Fill application and endorsed the filling of the drainage ditches as proposed.

A variance was previously granted by the Exeter Zoning Board of Adjustment on September 20<sup>th</sup>, 2022 to allow for the proposed expansion of the existing, non-conforming use of this parcel.

In addition to Site Plan approval by the Exeter Planning Board, the project is subject to the following approvals:

- NHDES Alteration of Terrain Permit
- NHDES Sewer Permit
- NHDES Minimum Expedited Dredge & Fill Permit

Should you have any questions, please do not hesitate to contact us at [Tburns@tfmoran.com](mailto:Tburns@tfmoran.com) or (603) 472-4488.



Civil Engineers  
Structural Engineers  
Traffic Engineers  
Land Surveyors  
Landscape Architects  
Scientists

March 31, 2023

Dave Sharples, Town Planner  
Planning and Building Department  
Town of Exeter  
10 Front Street  
Exeter, NH 03833

**RE: Site Plan Review TRC Comments – PB Case #23-4  
C/A Design, Inc. 131 Portsmouth Avenue  
Tax Map Parcel 52-112**

Dave,

On behalf of the Applicant, C/A Design, Inc., TFMoran, Inc. has reviewed the TRC comments, dated March 24, 2023. Based on those comments, we have updated the site plans and offer the following responses:

#### **TOWN PLANNER COMMENTS**

1. Are there any known environmental hazards onsite? Have any environmental studies been completed and, if so, please provide copies;  
**TFM RESPONSE: The Phase 1A environmental study is included as part of this revised submittal.**
2. Provide location of significant trees per Section 7.4.7. If none are present, please state that on the plan;  
**TFM RESPONSE: No trees greater than 20” caliper within limits of proposed work.**
3. Monumentation shall be set in accordance with Section 9.25;  
**TFM RESPONSE: A note has been added to the Site Layout Plan. It should be noted that all property corners were set and located as part of the recent subdivision of the parent parcel.**
4. The Existing Conditions plan shows a 15 foot-wide “Water Works Easement” across the southern part of the site. Please provide a copy of said easement to determine what will happen if this area needs to be excavated in the future;  
**TFM RESPONSE: A copy of the easement document is included as part of this submittal.**

5. Consult with Exeter Fire Department regarding fire hydrant location and knox box. Revise plans if needed;  
**TFM RESPONSE: Existing hydrants adjacent to the building and at the site entrance are indicated on the site drawings.**
6. Section 9.2.3 of the regulations state that the “architectural design guidelines may apply to industrial buildings.” This will be discussed by the Planning Board but it does not appear that this building will be visible from any public right-of-way and, even if parts of it are, it will be a considerable distance away;  
**TFM RESPONSE: Comment noted.**
7. Explain how the stormwater will (or will not) impact surrounding properties or wetland areas;  
**TFM RESPONSE: The stormwater management plan has been designed to intercept and treat runoff generated by the site. Captured runoff is routed to a proposed Stormtech subsurface system where discharge will be attenuated for flow and volume to match existing conditions at current outfall points. No new outfalls are proposed.**
8. Did a landscape architect choose the landscape species? If so, were they chosen based on soil and environmental conditions to insure the best chance of survival?  
**TFM RESPONSE: A licensed landscape architect has prepared the design, based on site conditions and species known for their hardiness in site conditions consistent with those of the subject parcel.**
9. The Planning Board may conduct a site walk. In preparation for the site walk, at a minimum, the applicant should clearly mark where all the buildings and parking areas will be located. In other words, it should be easy for the board to understand where the buildings will be and where traffic will flow through the site.  
**TFM RESPONSE: Should the Planning Board decide that a site walk is required for this project, we will mark the building and pavement locations in advance.**
10. Show snow storage areas on plans to insure they do not conflict with landscaping/utilities and drainage structures, etc.;  
**TFM RESPONSE: Snow storage areas have been added to the plans.**
11. Electric Vehicle (EV) charging readiness;  
**TFM RESPONSE: Four EV charging spaces have been added to the plans.**
12. Will the 18’ gravel access drive be maintained year-round? Place note on plans.  
**TFM RESPONSE: A maintenance note has been added to the Site Layout Plan.**

## **PUBLIC WORKS COMMENTS**

- Please see Underwood Engineers, Inc. (UEI) comment letter, dated March 23, 2023.  
**TFM RESPONSE: Responses to Underwood Engineers review comments are included under separate cover as part of this submittal.**

## **FIRE DEPARTMENT COMMENTS**

Fire Department comments have been submitted to the project architect to address as part of the building design.

Civil/Site Review:

- Hydrant near site access and towards rear of site (if applicable)  
**TFM RESPONSE: The location of existing fire hydrants adjacent to the building and at the rear of site have been indicated on the plans.**

## **NATURAL RESOURCE PLANNER COMMENTS**

- Invasive species management plan: there are documented invasive plant species onsite and a plan should be developed to prevent further spread of these plants during and after construction activities.  
**TFM RESPONSE: Invasive species management notes are included as part of the site plan package.**
- Stormwater management: we discussed the close proximity of the site to the Town's surface water supply (Dearborn Reservoir) . Due to this, proper management of stormwater during and after construction is paramount. We discussed the existing and proposed stormwater system and want to ensure that the Water Department is aware of this proposal and has an opportunity to comment on the design. We want to ensure that any stormwater leaving the site is treated using best available technology and does not impact the reservoir.  
**TFM RESPONSE: Comment noted.**

Enclosed as part of this submittal, please find the revised site plan materials, stormwater management report, and supporting documents. We appreciate your continued assistance with this project.

Sincerely,  
**TFMoran Inc.**



Thomas C. Burns, P.E.  
Senior Project Manager

186. administrators shall and will warrant and defend the same to the said grantee and her successors and assigns, against the lawful claims and demands of any person or persons whomsoever.

And I, Elsa B. Frederick, being unmarried, release all rights of Homestead of the within named premises.

In witness whereof, I, the said Elsa B. Frederick and I the said Minnie L. Wiesner in token of my acceptance of said trust, hereunto set our hands and seals this 26th day of December, in the year nineteen hundred and twenty-nine.

Signed and sealed and delivered in presence of  
Brainard E. Smith to both

Elsa B. Frederick (L.S.)  
Minnie L. Wiesner (L.S.)

COMMONWEALTH OF MASSACHUSETTS, Essex, ss. December 26, 1929.

Personally appeared the above named Elsa B. Frederick and acknowledged the foregoing instrument to be her voluntary act and deed, before me,

Brainard E. Smith-----

Received and recorded Dec. 27, 10:40 A.M., 1929.

*John W. A. Green Registrar*

Easement  
Boody et ux  
to  
E. Water Works  
del. to  
grantee  
by mail

KNOW ALL MEN BY THESE PRESENTS, That we, Frank L. Boody and M. Mary Boody, his wife, of the Town of Exeter in the State of New Hampshire, hereinafter called the "grantors", in consideration of Ten Dollars (\$10.00) and other good and valuable considerations to us paid by Exeter Water Works, a corporation under the laws of New Hampshire, and doing business at Exeter therein, hereinafter called the "grantee", the receipt whereof is hereby acknowledged, do hereby give, grant, bargain, sell and convey unto the grantee and its successors and assigns forever a certain easement and right of way upon, in and over land of the grantors located in said Exeter, which certain easement and right of way is bounded and described as follows:

Said right of way extends in width nine (9) feet Southerly and six (6) feet Northerly measured at right angles throughout its entire length from the following described line, but extends throughout its width to adjoining boundary lines;

Beginning at a stone bound, hereinafter called "Point 1", on the boundary line between land of the grantors and grantee, which point is two hundred eleven and 8/10 (211.8) feet South by twenty-five degrees fifty-minutes East (S. 25° 50' E.) of a point which is four hundred seventy-five (475) feet South by forty-six degrees seventeen minutes East (S. 46° 17' E.) from a stone bound on Portsmouth Avenue in said Exeter, and running from said point 1 South seventy-eight degrees fifty-five minutes East (S. 78° 55' E.) eight hundred (800) feet to a point on land now or formerly of John O'Callahan and being the Towle lot, so-called, which last mentioned point is designated "Point A", and after crossing said O'Callahan's land in the same course for a distance of two hundred ninety-three and 5/10 (293.5) feet, continues in the same course across other land of the grantors ninety-five (95) feet to other land now or formerly owned by said O'Callahan and being the Williams lot, so-called.

Reference being hereby had to another deed of even date herewith from said John O'Callahan to said grantee.

Hereby giving and granting to the grantee and its successors and assigns the right and easement by itself, its agents, servants or licensees, at any time and from time to time, to enter upon and pass and repass along said right of way, with or without vehicles, for the purpose of laying, placing, installing, repairing, replacing and maintaining thereon or therein a pipe or pipes for conveying the water from land now or formerly of Arthur C. Skinner and A. Louise Skinner, or either of them, to the pumping plant of the grantee, and in which to lay, place, install, repair, replace, and maintain any other equipment or apparatus which may be necessary or convenient to furnish light, power, communication, or other services or commodities between said land of the grantee and said Skinner land,

which easement and right of way shall be in all respects fully adequate for the purposes 187. aforesaid.

To have and to hold the foregoing premises, with all the rights, privileges and appurtenances thereunto belonging unto and to the use of the grantee, its successors and assigns forever.

And we, the said grantors, do hereby, for ourselves and for our heirs, executors or administrators, covenant with the said grantee, its successors and assigns, that we are lawfully seized in fee simple of the said granted premises, that the same are free from all encumbrances, that we have good right, full power and lawful authority to sell and convey the same in manner as aforesaid, that the grantee and its successors and assigns shall by these presents, at all times hereafter peaceably and quietly have and enjoy said premises and that said grantors will, and their heirs, executors and administrators shall, warrant and defend the same to the grantee and its successors and assigns forever against the lawful claims and demands of all persons.

And in consideration as aforesaid, said grantors and each of them do hereby release all their respective rights of curtesy or dower or other statutory or homestead rights in and to the said granted premises unto the grantee and its successors and assigns forever.

Reference is made to a certain previous deed from the grantors to the grantee dated the 27th day of August, A.D. 1929, the description wherein was erroneous in certain particulars, and this deed is a corrective deed executed and delivered for the purpose of correcting said deed of August 27th, 1929 and to convey said premises and hereditaments as in this present deed set forth and described.

In witness whereof we have hereunto set our hands and seals this 22nd day of December A.D. 1929.

Executed in presence of

Fred S. Fellowes

Frank L. Boody (L.S.)

M. Mary Boody (L.S.)

STATE OF NEW HAMPSHIRE, County of Rockingham ss.

Personally appeared the above named Frank L. Boody and M. Mary Boody, his wife, and acknowledged the foregoing instrument to be their voluntary act and deed, this 21st, day of December 1929.

Before me,

Fred S. Fellowes, Notary Public (N.P.Seal)

Received and recorded Dec. 27, 11:20 A.M., 1929.

*John W. A. Green Register*

KNOW ALL MEN BY THESE PRESENTS

That I, Chester G. Bisbee, of Derry, County of Rockingham, and State of New Hampshire for and in consideration of the sum of Seven Hundred eighty eight dollars to me in hand, before the delivery hereof, well and truly paid by Frank N. Young, of said Derry, said County, and said State the receipt whereof is hereby acknowledged, have given, granted, bargained and sold, and by these presents do give, grant, bargain, sell, alien, enfeoff, convey and confirm, unto the said Frank N. Young his heirs and assigns forever.

Mortgagee  
Bisbee  
to  
Young  
del. to  
grantee  
by mail

A certain lot of land with the buildings thereon, situated in Derry in the County of Rockingham and State of New Hampshire containing one Hundred and twenty-five (125) acres, more or less, and bounded and described as follows, to-wit; Commencing at the North west corner of the lot of land formerly owned by J.T.G. Dinsmore on the highway leading from Chester to Beaver Pond in Derry, thence southwesterly by said highway about two hundred and sixteen (216) rods to a stake and stones; thence Southerly 72° E. 17 rods 16 links by land of A. McMurphy and thence by said McMurphy land and land of Edmund Adams and land formerly owned by J.T.G. Dinsmore to the bound first mentioned, reserving the highway passing through said lot and reserving all wood and timber sold to Charles A. Adams,



Civil Engineers  
Structural Engineers  
Traffic Engineers  
Land Surveyors  
Landscape Architects  
Scientists

March 31, 2023

Dave Sharples, Town Planner  
Planning and Building Department  
Town of Exeter  
10 Front Street  
Exeter, NH 03833

**RE: Site Plan Review UEI Comments – PB Case #23-4  
C/A Design, Inc. 131 Portsmouth Avenue  
Tax Map Parcel 52-112**

Dave,

On behalf of the Applicant, C/A Design, Inc., TFMoran, Inc. has reviewed the design comments, dated March 24, 2023 and prepared by Underwood Engineers. Based on those comments, we have updated the site plans and offer the following responses:

#### **GENERAL**

1. It should be noted that a 10" water main runs through the Town of Exeter Water Works easement as depicted on sheet C2. The easement should be shown on all plans in the set.  
**TFM RESPONSE: The easement has been added to each of the plans in the set.**
2. Floor drains must be registered with the NHDES.  
**TFM RESPONSE: The owner/developer will coordinate registration of any floor drains to be installed, if applicable.**
3. Since this project classifies as Industrial, the Applicant should be directed to contact Steve Dalton at the Town of Exeter DPW regarding industrial discharge to the Town's system.  
**TFM RESPONSE: We will coordinate with Steve Dalton at Exeter DPW regarding proposed sewer discharge.**

#### **SITE PLAN**

4. If equipment pads will be required (e.g. HVAC, transformers, additional generator, etc.) show the pads on the plan.  
**TFM RESPONSE: Existing/proposed concrete pads are shown on the site plan.**

48 Constitution Drive  
Bedford, NH 03110  
Phone (603) 472-4488  
Fax (603) 472-9747  
[www.tfmoran.com](http://www.tfmoran.com)



5. Provisions for an electric vehicle charging station is required per the Town of Exeter regulations.

**TFM RESPONSE: (4) EV charging stations have been indicated on the site plan.**

6. We recommend installation of bollards to protect the existing hydrant on the north side of the existing building.

**TFM RESPONSE: Bollards have been added to provide protection for the two existing hydrants along the northwest side of the building.**

## UTILITY PLAN

7. Label sewer pipe slopes, size, and material.

**TFM RESPONSE: Labels indicating pipe slopes, diameters and materials are provided on the plan.**

8. Some of the sewer structures are approximately 13'-14' deep. ESHWT should be determined, and as appropriate, buoyancy of the structures should be evaluated.

**TFM RESPONSE: Depth to seasonal high water and potential for buoyancy has been reviewed for the proposed utility structures.**

9. Existing SMH 3494 lists two incoming pipes where only one is shown.

**TFM RESPONSE: The structure has been updated.**

10. The water and sewer service on the northwestern side of the building do not appear to be separated by 10'.

**TFM RESPONSE: There is a minimum 10' separation provided between the sewer and water lines in this location.**

11. Label the size and material of the proposed water lines.

**TFM RESPONSE: Labels indicating the pipe diameters and material are provided on the plan.**

12. An existing water line runs offsite under the southern entrance from GTE Drive. It is unclear where this water line goes or what parcel it services.

**TFM RESPONSE: The water line extends north to the existing building.**

13. It is unclear what the orphaned valves located near CBs 11 and 20 service. If they are no longer in use, please label them as abandoned.

**TFM RESPONSE: The discontinued valves have been labeled.**

14. The 10" CI water main within the Town of Exeter Water Works easement should be located and shown on the plans. What measures are being proposed to protect the water main during construction? Amend plans as appropriate.

**TFM RESPONSE: The water main has been added to the plans. The proposed site design has been revised to remove subsurface components within the easement.**

15. A proposed (SS) light pole is shown in the middle of the Town of Exeter Water Works easement. This placement appears imprudent.

**TFM RESPONSE: The light pole has been relocated out of the easement.**

16. Notes:

- Note 3: It should be noted that the Town of Exeter is not a member of Dig Safe.

**TFM RESPONSE: The note has been revised.**

- Note 10 should be removed.

**TFM RESPONSE: The note has been removed.**

- A note should be added to indicate the site contractor must obtain an Exeter utility pipe installer's license and the job supervisor or foreman must be certified by the Town prior to working on any Town-owned water, sewer or drainage pipes or utilities that will connect or may connect to any Town-owned water, sewer, or drainage system. A licensed supervisor or foreman must be present at the job site at all times during construction of these utilities.

**TFM RESPONSE: The requested note has been added to the plan.**

## GRADING AND DRAINAGE PLANS

17. The underground detention system is in direct conflict with the existing 10" water main within the Town of Exeter's Water Works easement.

**TFM RESPONSE: The stormwater detention system has been relocated out of the easement.**

18. DMH23 lists 2 pipe inverts where 3 are shown.

**TFM RESPONSE: The drainage structure/label have been updated.**

19. The existing inlet pipe into DMH28 from the outlet structure of the pond is listed as 12" HDPE on the existing conditions plan and as 15" on other plans. T

**TFM RESPONSE: The label has been revised to indicate the 12" diameter of the pipe.**

20. Provide information on the age and condition of the existing 36" CMP at the tie-in point with DMH29. The 4" PVC pipe daylighting at the headwall appears likely to be an underdrain. Does the proposed project require similar underdrain?

**TFM RESPONSE: The 36" CMP has been inspected where visible and appears in good condition. The 4" pvc pipe is a weep hole in the headwall.**

21. Indicate tie-ins to the drainage system from foundation drains and roof drains.

**TFM RESPONSE: The roof drain tie-in has been indicated on the plan.**

22. The three existing drain manholes in the southern corner of the site that discharge to the wetland are not labeled. A label should be added to the northernmost structure to indicate the cover may need to be raised or lowered to match the finished grade.

**TFM RESPONSE: The requested label has been added to the structure.**

## LANDSCAPE PLAN

23. Proposed plantings within the Water Works easement should be carefully evaluated and possibly removed.

**TFM RESPONSE: The landscape design has been revised to remove proposed plantings from the easement.**

24. Subsurface utilities should be shown on the plan to determine conflicts.

**TFM RESPONSE: The utilities have been added to the landscape plan.**

## STORMWATER MANAGEMENT PLAN

25. A concrete washout pit should be indicated.

**TFM RESPONSE: A washout pit has been added to the plan.**

## DETAIL SHEETS

26. The Isolator Row detail on sheet C-17:

- Sump depth is deferred to the site design engineer. Revise this note to indicate the sump depth proposed.

**TFM RESPONSE: The sump depth and elevation have been added.**

- A note on the detail recommends inserts in upstream structures with open grates. It is not clear if these inserts will be installed.

**TFM RESPONSE: The inserts have been removed from the detail.**

27. Add the following details:

- Lined concrete washout area.

**TFM RESPONSE: The detail has been added.**

- Grease interceptor, if applicable.

**TFM RESPONSE: Not anticipated at this time.**

- Equipment pads for exterior HVAC, transformers, etc., as applicable.

**TFM RESPONSE: A concrete pad detail has been added to the plans.**

## STORMWATER DESIGN AND MODELING

28. The rainfall amounts must be increased by 15% per AoT regulation Env-Wq 1503.08(1).

**TFM RESPONSE: The rainfall intensities have been updated.**

29. ESHWT and depth to ledge information should be provided in the area of the Stormtech system. Please provide test pit logs if available.

**TFM RESPONSE: The test pit logs are included as part of the revised submittal.**

30. Provide pollutant removal calculations to show compliance with Town of Exeter removal requirements for nitrogen, phosphorus and TSS.

**TFM RESPONSE: Per the NHDES Stormwater Manual, the proposed Stormtech underground stormwater management system (with underdrain) is accepted as**

**providing up to 85% removal of Total Suspended Solids through the pretreatment Isolator Row, 10% removal of Total Nitrogen and 45% removal of Total Phosphorus through the filter media. This was confirmed with Advanced Drainage Systems, Inc., the manufacturer of the ADS Stormtech systems. Additionally, two Contech Jellyfish water treatment units are proposed to provide an initial 51% removal of Total Nitrogen and 59% removal of Total Phosphorus for the first flush.**

**In combination, the use of the Contech Jellyfish water treatment units and the Stormtech stormwater management system meet the Town of Exeter's requirements for nitrogen, phosphorus and TSS removal. More information on the products, including design specifications, can be found on the construction detail sheets.**

31. The Stormtech outlet structure doesn't have any structure notes, ie rim, inverts.

**TFM RESPONSE: The structure note has been added to the plans.**

32. DMH26 only depicts two pipe inverts when three pipes are present.

**TFM RESPONSE: The structure label have been updated.**

33. The total runoff volume from the site increases by approximately 36,000 CF during the 50-year storm. Please address this quantity in the narrative.

**TFM RESPONSE: The proposed stormwater design meets both the Town of Exeter and NHDES requirements for attenuation of stormwater flow and volume for all analyzed storm events. This includes proposing no increase in generated flows and volumes in the 2-year storm as required by NHDES and no increases in generated rate of runoff in the 10-year and 50-year storm events.**

34. PTAP Database: This project requires registration with the PTAP Database. The Applicant is requested to enter project related stormwater tracking information contained in the site plan application documents using the Great Bay Pollution Tracking and Accounting Program (PTAP) database ([www.unh.edu/unhsc/ptapp](http://www.unh.edu/unhsc/ptapp)) and submit the information with the resubmitted response to comments.

**TFM RESPONSE: The project has been registered with the PTAP Database. A copy of the confirmation email is included with the submittal materials.**

Enclosed as part of this submittal, please find the revised site plan materials, stormwater management report, and supporting documents. We appreciate your continued assistance with this project.

Sincerely,  
**TFMoran Inc.**



Thomas C. Burns, P.E.  
Senior Project Manager

## Thomas Burns

---

**From:** noreply@ptapp.unh.edu on behalf of PTAPP <noreply@ptapp.unh.edu>  
**Sent:** Friday, March 31, 2023 10:20 AM  
**To:** Thomas Burns  
**Subject:** Account details for Wakefield-Thermal-Exeter at PTAPP (pending admin approval) [Filed 31 Mar 2023 10:30]

**Categories:** Filed by Mail Manager

Wakefield-Thermal-Exeter,

Thank you for registering at PTAPP. Your application for an account is currently pending approval. Once it has been approved, you will receive another email containing information about how to log in, set your password, and other details.

-- PTAPP team

2932.00

April 6, 2023

Mr. David Sharples, Town Planner  
Town Planning Office, Town of Exeter  
10 Front Street  
Exeter, NH 03833

**Re: Wakefield Thermal / C/A Design Building Expansion  
Design Review Engineering Services  
Exeter, New Hampshire**

**Site Information:**

---

Tax Map/Lot#:	52 / 112A
Address:	131 Portsmouth Avenue
Lot Area:	9 Acres
Proposed Use:	Industrial
Water:	Town
Sewer:	Town
Zoning District:	C-2 and CT
Applicant:	C/A Design
Design Engineer:	TFMoran

Review No. 2

**Application Materials Received:**

- Site plan set entitled "Building Expansion" revised March 31, 2023 prepared by TFMoran.
- Response letters prepared by TFMoran dated March 31, 2023.
- Miscellaneous materials prepared by TFMoran.
- Stormwater calculations and stormwater maintenance manual prepared by TFMoran revised March 31, 2023.

Dear Mr. Sharples:

Based on our review of the above information, in addition to comments provided by the Town, we offer the following comments in accordance with the Town of Exeter Regulations and standard engineering practice. Please note prior comments no longer listed below have been addressed satisfactorily with no exception taken.

Utility Plan

7. The slope of the sewer pipes are less than the required minimum. It appears to UE that alternatives exist that could address or at least improve upon the proposed “flat” sewer pipe slopes, including the elimination of SMH 1 and/or the reconfiguration of the proposed connection to the existing pipe at or downstream of SMH3394. If compliance cannot be achieved, UE would prefer a reduction in the drop across the SMH’s as opposed to pipe slopes below 0.004. UE defers further comment to the NHDES.
8. Applicant states that manhole buoyancy has been reviewed, however information was not provided in the response. UE defers further response to DES.
9. UE notes the SMH invert response, however the drawings do not appear to be updated accordingly.
12. UE notes the water line response; however the drawings do not appear to be updated accordingly.

Grading and Drainage Plans

18. DMH 23 still lists two (2) pipe inverts where three (3) are shown. UE notes the DMH invert response, however the drawings do not appear to be updated accordingly.

Landscape Plan C-7

- 23./24. Subsurface utilities lines are still not shown on the plan. A number of conflicts between proposed plantings and utilities appear likely, for example:
- a. A red oak tree is shown just outside the Exeter Water Works easement. This tree should be positioned so the roots of the tree will not interfere with the existing water main in general or during future replacement.
  - b. A London Planetree planted atop a drain line at the southern corner of the building addition.
  - c. Conflicts between proposed trees and the waterlines running between GTE Drive and the new parking (opposite the loading docks).
  - d. Conflicts between existing drain lines at the southeast corner of the site and proposed trees.

Detail Sheets

26. The Isolator Row detail on sheet C-17:
  - UE acknowledges that the insert and note has been removed from the detail. We understand that the intent is to remove the inserts once construction is complete, but we concur with ADS’ recommendation that the inserts should be used during construction to protect the system from construction debris.



Page 3 of 3  
Mr. David Sharples  
April 6, 2023

Stormwater Design and Modeling

Please note a full review of the stormwater calculations was not performed, as we defer to AoT comments pertaining to the calculations.

A written response is required to facilitate future reviews. Please contact us if you have any questions.

Very truly yours,

UNDERWOOD ENGINEERS, INC.

Allison M. Rees, P.E.  
Project Manager



Robert J. Saunders, P.E.  
Senior Project Engineer







TOWN OF EXETER, NEW HAMPSHIRE

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 • FAX 772-4709

[www.exeternh.gov](http://www.exeternh.gov)

September 21, 2022

Justin L. Pasay, Esquire  
Donahue, Tucker & Ciandella PLLC  
16 Acadia Lane  
POB 630  
Exeter, New Hampshire 03833

Re: Zoning Board of Adjustment Case #22-12 - Variance Request – 131 Portsmouth Avenue, LLC  
131 Portsmouth Avenue, Exeter, N. H.  
Tax Map Parcel #52-112

Dear Attorney Pasay:

This letter will serve as official confirmation that the Zoning Board of Adjustment, at its September 20<sup>th</sup>, 2022 meeting, voted to grant the above-captioned application for a variance from Article 5, Section 5.1.2 to permit the expansion of a non-conforming light industry use on the property located at 131 Portsmouth Avenue, as presented.

Please be advised that in accordance with Article 12, Section 12.4 of the Town of Exeter Zoning Ordinance entitled “Limits of Approval” that all approvals granted by the Board of Adjustment shall only be valid for a period of three (3) years from the date such approval was granted; therefore, should substantial completion of the improvements, modifications, alterations or changes in the property not occur in this period of time, this approval will expire.

If you should have any questions, please do not hesitate to contact the Building Department office at (603) 773-6112.

Sincerely,

Kevin M. Baum  
Chairman  
Exeter Zoning Board of Adjustment

cc: 131 Portsmouth Avenue, LLC, property owner  
Douglas Eastman, Building Inspector/Code Enforcement Officer  
Janet Whitten, Town Assessor

KMB: bsm

Town of Exeter  
Zoning Board of Adjustment  
September 20, 7 PM  
Town Offices Nowak Room  
Final Minutes

I. **Preliminaries**

**Members Present:** Chair Kevin Baum, Vice-Chair Robert Prior, Clerk Esther Olson-Murphy, Rick Thielbar, Martha Pennell - Alternate

**Members Absent:** Laura Davies, David Mirsky - Alternate, Joanne Petito – Alternate. Chris Merrill is no longer a member.

**Call to Order:** Chair Baum called the meeting to order at 7 PM.

I. **New Business**

- A. The application of 131 Portsmouth Avenue LLC for a variance from Article 5, Section 5.1.2 to permit the expansion of a non-conforming light industry use on the property located at 131 Portsmouth Avenue. The subject parcel is located in the C-2, Highway Commercial and CT-Corporate/Technology Park zoning districts. Tax Map Parcel #52-112. ZBA Case #22-12.

Attorney Justin Pasay of DTC Lawyers was present to discuss the application. This proposal would clean up the zoning demarcation between C2 and CT. Holland Way is in the CT district, and a portion of Portsmouth Ave is in the C2 District. Osram Sylvania was a large 32 acre site with a zoning line that split the property down the middle. Since it was split, there have been subdivisions which make the zoning line arbitrary. There are two buildings on the property: a larger building of 135,000 square feet, and a smaller building of 74,000 square feet. At the 2019 Town Meeting, voters decided to change the PP District along Holland Way to the Corporate/Technology Park (CT) District, in order to attract light industrial applications. In 2020, the first subdivision of the Osram site occurred. This created two lots, one of 16.5 acres and the big building, and a second lot of 15 acres with the smaller building. Subsequently, 131 Portsmouth Ave LLC bought the 15-acre site with the smaller building. Last month a further subdivision was approved: the applicants intend to sell a 9 acre lot to CA Design, a company which produces products for the fence industry, a light industrial use. CA would put an addition to the 74,000 square foot building to create a 114,000 square foot building. This building is split by the zoning district; most of it in CT, but the proposed addition is in C2, where light industrial use is not allowed. That's why they need a variance.

Mr. Prior asked about access from Holland Way rather than access from Portsmouth Ave for the new subdivision. Mr. Pasay said it will be up to CA Design to go before the Planning Board and discuss those types of issues. A DOT permit has been obtained for access onto Holland Way.

45 Mr. Prior asked if any further requests would come forward, such as parking or  
46 access. Attorney Pasay said this plan doesn't require any additional relief.

47 Attorney Pasay went through the variance criteria. 1) The variance will not be  
48 contrary to the public interest and 2) The spirit of the ordinance will be observed; yes,  
49 there is no conflict with the purpose of the zoning ordinance. The proposal advances the  
50 purpose of the governing body and of the Master Plan. Town meeting in 2019 rezoned  
51 the CT District to attract more light industrial development. This use is compatible with  
52 the existing surrounding uses, such as Osram. More jobs, more prosperity, and more tax  
53 revenue are in the public interest. There's no threat that this proposal will alter the  
54 essential character of the neighborhood. The proposal is consistent with intent of the  
55 zoning ordinance. 3) Substantial justice is done; yes, there's no identifiable public gain  
56 from the denial. If the variance is denied, the intent of the 2019 zoning ordinance change  
57 and the Master Plan will be frustrated. 4) The value of surrounding properties will not be  
58 diminished; yes, we don't foresee any detriment. If anything, this expansion will increase  
59 the value of this property, which will increase the value of surrounding properties. 5)  
60 Literal enforcement of zoning ordinance will result in an undue hardship; yes, the special  
61 circumstances are that the property and the building itself are bifurcated by the zoning  
62 line. The purpose of the zoning ordinance, which is to advance the public interest,  
63 facilitate reasonable development, and limit incompatible development, would not be  
64 observed by applying it to this property. Granting the variance actually advances the  
65 public interest and accomplishes reasonable and compatible development. The  
66 proposed use is reasonable by virtue of the uses on the property for years and town  
67 meeting's intent to facilitate this type of use on this property.

68 Mr. Thielbar said he's not clear on what the variance should say. Is the applicant  
69 asking for all of the green area on the map to be zoned CT, or just to make sure they  
70 can build a building? Attorney Pasay said the variance is to permit the expansion of a  
71 non-conforming use with the 40,000 square foot addition to the existing building. It's not  
72 requested to re-zone the property. Mr. Baum said it's to permit the expansion as  
73 proposed, nothing additional. Attorney Pasay said the proposal was designed to  
74 encompass what CA Design plans to do with the building.

75 Mr. Prior asked if 131 Portsmouth Avenue is the address only for the green  
76 portion of the map. Attorney Pasay said that was the address for the pre-subdivision  
77 parcel, and he doesn't know of any reassigning of address. Doug Eastman said that lot  
78 has not been numbered yet. Both parcels are currently considered 131 Portsmouth. Mr.  
79 Prior said we can refer to it as 131 Portsmouth Ave lot A.

80 Mr. Baum read a memo from the Economic Development Director in support of  
81 the application, which he said could bring up to 200 jobs to the town.

82 Mr. Baum opened the discussion to the public, but there was no comment. Mr.  
83 Baum brought the discussion back to the Board.

84 Mr. Prior said he believed that the general consensus of the Board was that the  
85 proposal meets the variance criteria. Ms. Pennell said her only possible concern would  
86 be a potential future exit to Holland Way, but that doesn't have anything to do with this  
87 application.

88

89 Mr. Prior made a motion to approve the application of 131 Portsmouth Avenue LLC for a  
90 variance from Article 5, Section 5.1.2 to permit the expansion of a non-conforming light  
91 industrial use on the property located at 131 Portsmouth Avenue, aka Map 51 Lot 112A, as  
92 proposed. Mr. Thielbar seconded. Mr. Baum, Mr. Thielbar, Ms. Olson-Murphy, Ms. Pennell, and  
93 Mr. Prior voted aye. The motion passed 5-0.

94  
95 B. A request for rehearing the August 16 Zoning Board decision for 81 High Street,  
96 the Phillips Exeter application, to permit the property be used for multi-family  
97 without the over-55 restriction.

98 Mr. Baum said the rehearing would only take place if there were an error  
99 made or if there were facts not known at the time of the decision. This is purely  
100 deliberative and not open for public discussion. He was not present for the  
101 meeting but reviewed the minutes and is prepared to vote.

102 Mr. Thielbar said when the original variance was issued, there was a  
103 historic building that was falling down. Through a lot of discussion, we decided  
104 that by having an age-restricted use, we would have very little impact on the  
105 surrounding territory and would permit the upgrade of the structure. That facility  
106 has been run successfully for a number of years. The hardship no longer exists.  
107 The essence of the applicant's argument was that since the variance allowed  
108 multi-family housing, any condition on that use is not enforceable, but he [Mr.  
109 Thielbar] doesn't think that's true. The current owner having to raise the prices in  
110 order to run the facility may be a hardship for the residents, but not a hardship for  
111 the property.

112 Ms. Olson-Murphy said they didn't give us anything new to work with,  
113 they're just restating the argument. Mr. Baum said it says that the Board found  
114 that hardship existed in 2011, so it still exists, but he doesn't agree. When the  
115 Board made its decision in 2011, the over-55 restriction was part of it.

116 Ms. Pennell said she read the minutes and got the impression that the  
117 house back then couldn't sell, because there was no market for such a large  
118 single-family house. This seemed like the only way to go. Ms. Olson-Murphy said  
119 a 12,000 square foot building is never going to be a family home. Ms. Pennell  
120 said she's not sure that still true. If you put it on the market now, it may sell.

121 Mr. Prior said he was not present, but he's read the minutes and is ready  
122 to make a vote.

123 Ms. Pennell asked if part of the applicant's argument was that we should  
124 not be considering the variance, but consider the property without the variance?  
125 Ms. Olson-Murphy said even if we did, we would come to the same decision,  
126 because it's not a dilapidated building that needs work. It's a nice building now  
127 that could be sold as a 14 unit building. Ms. Pennell said he could probably sell it  
128 as a single-family. Mr. Prior said that's immaterial.

129  
130 Mr. Thielbar made a motion to deny the request to reconsider. Mr. Prior seconded. Mr. Baum,  
131 Mr. Thielbar, Ms. Olson-Murphy, Ms. Pennell, and Mr. Prior voted aye. The motion passed 5-0.

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**II. Other Business**

A. Minutes of August 16, 2022

Corrections: Mr. Baum said there were some references to “Attorney Wilson,” but was that Attorney Roy Tilsley or Steve Wilson, the property owner? The Board reviewed the minutes and decided that each reference should read “Attorney Tilsley.”

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Ms. Olson-Murphy made a motion to accept the minutes with updating the mentions of “Attorney Wilson” in lines 177, 185, and 191 to be “Attorney Tilsley.” Mr. Thielbar seconded. Mr. Thielbar, Ms. Olson-Murphy, and Ms. Pennell voted aye. Mr. Baum and Mr. Prior abstained because they were not present at the August 16 meeting. The motion passed 3-0-2.

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B. Mr. Prior and Ms. Pennell said they must recuse themselves from the Riverwoods application to be considered at the next meeting.

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**III. Adjournment**

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Mr. Prior moved to adjourn. Mr. Baum seconded. Mr. Baum, Mr. Thielbar, Ms. Olson-Murphy, Ms. Pennell, and Mr. Prior voted aye. The motion passed 5-0 and the meeting was adjourned at 7:50 PM.

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Respectfully Submitted,  
Joanna Bartell  
Recording Secretary



Barbara Mcevoy &lt;bmcevoy@exeternh.gov&gt;

**Fwd: Wakefield Thermal Site Improvements**

1 message

Kristen Murphy &lt;kmurphy@exeternh.gov&gt;

Thu, Mar 23, 2023 at 6:43 AM

To: Barbara Mcevoy &lt;bmcevoy@exeternh.gov&gt;, David Sharples &lt;dsharples@exeternh.gov&gt;

No comments from me. I will be at CAW til 12 and will miss the TRC.

The applicant attended the Feb CC meeting and the CC signed their expedited wetland application and offered additional comments for PB consideration.

See email to Dave below.

----- Forwarded message -----

From: **Andrew Koff** <drewkoff@gmail.com>

Date: Thu, Feb 23, 2023 at 10:52 AM

Subject: Wakefield Thermal Site Improvements

To: David Sharples <dsharples@exeternh.gov>

CC: Kristen Murphy <kmurphy@exeternh.gov>

Hello Dave-

I'm following up on behalf of the Conservation Commission with comments based on our 2/21/23 meeting on the expedited wetlands application and site improvements for Wakefield Thermal off Holland Way. We had a good discussion with Tom Burns with TF Moran about the site plans and we agreed to sign their expedited state wetlands application. We had a few separate comments, not related to the wetlands impact, that we wanted to convey to the planning board for their review:

- Invasive species management plan: there are documented invasive plant species onsite and a plan should be developed to prevent further spread of these plants during and after construction activities.
- Stormwater management: we discussed the close proximity of the site to the Town's surface water supply (Dearborn Reservoir). Due to this, proper management of stormwater during and after construction is paramount. We discussed the existing and proposed stormwater system and want to ensure that the Water Department is aware of this proposal and has an opportunity to comment on the design. We want to ensure that any stormwater leaving the site is treated using best available technology and does not impact the reservoir.

Let me know if you have any questions on this and please pass this on to the Planning Board during your review.

Regards,  
Andrew Koff  
Chair of the Conservation Commission

--  
Kristen Murphy  
Conservation and Sustainability Planner  
Town of Exeter  
10 Front Street, Exeter, NH 03833  
(603) 418-6452

Exeter Conservation Commission  
February 21, 2023  
Exeter Town Offices  
10 Front Street  
7:00 PM  
Draft Minutes

**Call to Order**

1. Introduction of Members Present (by Roll Call)

Present at tonight's meeting were by roll call, Chair Andrew Koff, Vice-Chair Trevor Mattera, Nick Campion, Kyle Welch, and Nancy Belanger, Select Board Representative

Staff Present:

Mr. Koff called the meeting to order at 7:00 PM.

2. Public Comment

Mr. Koff asked if there was any public comment and there was none.

**Action Items**

1. Minimum impact expedited application from Wakefield Thermal for the fill of 2,652 SF of man-made wetlands associated with former drainage structures for the expansion of an existing industrial building, construction of new/replacement parking circulation, loading docks and other associated site improvements as part of its scope (*Tom Burns, TF Moran*)  
Tax Map 52 Lot 112-A

Tom Burns, Senior Project Engineer from TF Moran, Bedford, NH, presented the minimum impact expedited application for Wakefield Thermal. He indicated they purchased 131 Portsmouth Ave which is near Osram Sylvania. He noted the plan is to have up to 150 employees on site, beginning with about half of that amount and to expand parking. Mr. Burns showed the plan and indicated they have their curb cut and driveway permit from DOT. Access will be via Holland Way. Fire access will be around the perimeter of the building.

Mr. Burns indicated that the wetland scientist (not present) is Jay Aube and his opinion was that the wetlands were manmade. He showed three small areas on the plan. He noted drainage areas took pavement runoff toward the old loading dock and culverts were tied in. The permit is for 2,500 SF of impact. He noted that he met with Ms. Murphy and Mr. Sharples about a month ago. The application deadline for site plan with the Planning Board is next week.

44 Mr. Koff asked if there were any buffers – no. Mr. Burns noted the wetlands were mostly scrubby  
45 areas.

46  
47 Ms. Eberhardt noted that while a lot of applications claim low value wetlands with low functions she  
48 feels these actually area. She noted some invasives, purple loose strife and cattails. She asked if  
49 there were a plan to deal with invasives during construction. Mr. Burns stated that he would talk to  
50 Mr. Aube and find out. He indicated that as part of the AoT with the State, they advise the  
51 contractors of NHB hits and how to deal with invasives.

52  
53 Mr. Mattera asked about the stormwater plan and Mr. Burns descried the capture of runoff and  
54 closed drainage system with treatment under the loading area. There is no infiltration because of  
55 the nature of the soils which is mostly clay. He noted the outfall is to an existing 36” culvert picked  
56 up by adjacent sites including Hannaford.

57  
58 Ms. Eberhardt asked about climate change modeling and Mr. Burns indicated they design for 2-10-  
59 50 but recognize the occasional 100-year in their design plans.

60  
61 Mr. Koff asked about GTE Drive and Mr. Burns showed access from Portsmouth Ave and indicated  
62 to reduce traffic they prefer to come off Holland Way.

63  
64 Ms. Eberhardt asked what sort of manufacturing was being done and Mr. Burns indicated he  
65 believed they were military contracts.

66  
67 Mr. Koff asked about other facilities and Mr. Burns noted he believed they had other facilities in  
68 Nashua.

69  
70 MOTION: Mr. Koff motioned that after reviewing the application the Commission agrees to waive  
71 its right to intervene in the application as proposed and authorize the Chair to sign on their behalf.  
72 Mr. Mattera seconded the motion. A vote was taken, all were in favor, the motion passed 5-0-0.

73  
74 Mr. Koff signed the application.

75  
76 Mr. Koff asked whether the Commission wished to make any comments to the Planning Board:  
77 concerning invasive management and stormwater management (protection of the reservoir).

78  
79 MOTION: Mr. Koff motioned to send a message to the Planning Board concerning invasives and  
80 stormwater management (protection of reservoir). Ms. Eberhardt seconded the motion. A vote  
81 was taken, all were in favor, the motion passed unanimously.

82  
83 Mr. Burns indicated the size of the underground chambers.

84  
85 Mr. Koff will contact the Planning Board.

86  
87





# TOWN OF EXETER, NH APPLICATION FOR SITE PLAN REVIEW

### OFFICE USE ONLY

**THIS IS AN APPLICATION FOR:**

- COMMERCIAL SITE PLAN REVIEW
- INDUSTRIAL SITE PLAN REVIEW
- MULTI-FAMILY SITE PLAN REVIEW
- MINOR SITE PLAN REVIEW
- INSTITUTIONAL/NON-PROFIT SPR

_____	APPLICATION #
_____	DATE RECEIVED
_____	APPLICATION FEE
_____	PLAN REVIEW FEE
_____	ABUTTERS FEE
_____	LEGAL NOTICE FEE
_____	TOTAL FEES

_____	INSPECTION FEE
_____	INSPECTION COST
_____	REFUND (IF ANY)

1. **NAME OF LEGAL OWNER OF RECORD:** NH Exeter Properties, LLC (c/o Matt Van Zile)  
 \_\_\_\_\_ **TELEPHONE:** ( ) \_\_\_\_\_

**ADDRESS:** 70 W. Madison St., Suite 5600 Chicago, IL 60602

2. **NAME OF APPLICANT:** C/A Design, Inc. (c/o Matt Van Zile @ Wakefield Thermal)

**ADDRESS:** 120 Northwest Blvd. Nashua, NH 03063  
 \_\_\_\_\_ **TELEPHONE:** ( ) \_\_\_\_\_

3. **RELATIONSHIP OF APPLICANT TO PROPERTY IF OTHER THAN OWNER:** \_\_\_\_\_

The Applicant and Owner are affiliated entities, sharing the same stakeholders.  
 (Written permission from Owner is required, please attach.)

4. **DESCRIPTION OF PROPERTY:** Existing/Proposed Industrial Manufacturing Facility

**ADDRESS:** 131 Portsmouth Avenue

**TAX MAP:** 52 **PARCEL #:** 112A **ZONING DISTRICT:** CT/C-2

**AREA OF ENTIRE TRACT:** 9.026 AC. **PORTION BEING DEVELOPED:** 5.80 AC.



5. **ESTIMATED TOTAL SITE DEVELOPMENT COST \$** \_\_\_\_\_

6. **EXPLANATION OF PROPOSAL:** The applicant proposes to construct a 40,000 s.f. addition to the existing manufacturing/warehouse facility, with expanded parking and loading areas and related site improvements.

7. **ARE MUNICIPAL SERVICES AVAILABLE? (YES/NO)** YES - Existing Municipal Services (sewer, water, drain)

If yes, Water and Sewer Superintendent must grant written approval for connection.

If no, septic system must comply with W.S.P.C.C. requirements.

8. **LIST ALL MAPS, PLANS AND OTHER ACCOMPANYING MATERIAL SUBMITTED WITH THIS APPLICATION:**

<u>ITEM:</u>	<u>NUMBER OF COPIES</u>
A. <u>Site Plan Package</u>	_____
B. <u>Stormwater Management Report</u>	_____
C. <u>Traffic Memo</u>	_____
D. <u>Letter from CWS re: existing wetlands</u>	_____
E. _____	_____
F. _____	_____

9. **ANY DEED RESTRICTIONS AND COVENANTS THAT APPLY OR ARE CONTEMPLATED (YES/NO)** No IF YES, ATTACH COPY.

10. **NAME AND PROFESSION OF PERSON DESIGNING PLAN:**

**NAME:** Thomas C. Burns, P.E. / TFMoran, Inc.

**ADDRESS:** 48 Constitution Drive Bedford, NH 03110

**PROFESSION:** Civil Engineer **TELEPHONE:** ( 603 ) 472-4488

11. **LIST ALL IMPROVEMENTS AND UTILITIES TO BE INSTALLED:**

Proposed 40,000 S.F. building addition, site access drive from Holland Way, expanded onsite parking, and loading area. Utility improvements include relocated sewer and drainage with onsite stormwater management system (subsurface).



**12. HAVE ANY SPECIAL EXCEPTIONS OR VARIANCES BEEN GRANTED BY THE ZONING BOARD OF ADJUSTMENT TO THIS PROPERTY PREVIOUSLY?**

IF YES, DESCRIBE BELOW. (Please check with the Planning Department Office to verify)

- Feb 10, 1994-ZBA Case 1023 SE and Variance granted for proposed expansion of n/c use and for a portion of the expansion to exceed maximum height regulation.
- Jan 16, 1996-ZBA Case 1062 SE granted for expansion of n/c use (16'x60' addition)
- Oct 21, 2003-ZBA Case 1251 Variance granted to permit 10 acres to be developed with C-2 zoning regs.
- Oct 17, 2006-ZBA Case 1322 SE granted for expansion of n/c use to permit proposed 41,173 SF expansion of existing manufacturing facility.
- Sep 20, 2022-ZBA Case 22-12 Variance granted to permit expansion of a n/c light industry use.

**13. WILL THE PROPOSED PROJECT INVOLVE DEMOLITION OF ANY EXISTING BUILDINGS OR APPURTENANCES? IF YES, DESCRIBE BELOW.**

(Please note that any proposed demolition may require review by the Exeter Heritage Commission in accordance with Article 5, Section 5.3.5 of the Exeter Zoning Ordinance).

No-existing building to remain.

**14. WILL THE PROPOSED PROJECT REQUIRE A “NOTICE OF INTENT TO EXCAVATE” (State of NH Form PA-38)? IF YES, DESCRIBE BELOW.**

No.

**NOTICE:** I CERTIFY THAT THIS APPLICATION AND THE ACCOMPANYING PLANS AND SUPPORTING INFORMATION HAVE BEEN PREPARED IN CONFORMANCE WITH ALL APPLICABLE REGULATIONS; INCLUDING BUT NOT LIMITED TO THE “SITE PLAN REVIEW AND SUBDIVISION REGULATIONS” AND THE ZONING ORDINANCE. FURTHERMORE, IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 15.2 OF THE “SITE PLAN REVIEW AND SUBDIVISION REGULATIONS”, I AGREE TO PAY ALL COSTS ASSOCIATED WITH THE REVIEW OF THIS APPLICATION.

DATE 2/23/2023

OWNER’S SIGNATURE

Digitally signed by Matt Van Zile  
DN: cn=Matt Van Zile gn=Matt Van Zile c=US United States l=US United States ou=Wakefield Thermal Solutions e=mvanzile@wakefieldthermal.com Date: 2023-02-23 13:26:05:00

ACCORDING TO RSA 676.4.I ( c ), THE PLANNING BOARD MUST DETERMINE WHETHER THE APPLICATION IS COMPLETE WITHIN 30 DAYS OF SUBMISSION. THE PLANNING BOARD MUST ACT TO APPROVE, CONDITIONALLY APPROVE, OR DENY AN APPLICATION WITHIN SIXTY FIVE (65) DAYS OF ITS ACCEPTANCE BY THE BOARD AS A COMPLETE APPLICATION. A SEPARATE FORM ALLOWING AN EXTENSION OR WAIVER TO THIS REQUIREMENT MAY BE SUBMITTED BY THE APPLICANT.



**ABUTTERS:** PLEASE LIST ALL PERSONS WHOSE PROPERTY IS LOCATED IN NEW HAMPSHIRE AND ADJOINS OR IS DIRECTLY ACROSS THE STREET OR STREAM FROM THE LAND UNDER CONSIDERATION BY THE BOARD. THIS LIST SHALL BE COMPILED FROM THE EXETER TAX ASSESSOR'S RECORDS.

TAX MAP 51 Lot 14 Unit 1  
NAME McFarland Realty Trust  
ADDRESS 151 Portsmouth Avenue  
Exeter, NH 03833

TAXMAP 51 Lot 15  
NAME Kevin King Enterprises  
ADDRESS P.O. Box 6500  
Clarise, PA 17013

TAX MAP 51 Lot 17  
NAME One Four Six Post Road LLC  
ADDRESS 151 Portsmouth Avenue  
Exeter, NH 03833

TAX MAP 52 Lot 51  
NAME SAF Realty, LLC  
ADDRESS 100 Portsmouth Avenue  
Exeter, NH 03833

TAX MAP 52 Lot 52  
NAME 108 Heights LLC  
ADDRESS 65 Post Road  
Hooksett, NH 03106

TAXMAP 52 Lot 53  
NAME Exeter Lumber  
ADDRESS 120 Portsmouth Avenue  
Exeter, NH 03833

TAX MAP 52 Lot 111  
NAME Laurence D Foss  
ADDRESS 30 Bunker Hill Avenue  
Stratham, NH 03885

TAX MAP 52 Lot 112-A  
NAME NH Exeter Properties LLC (Owner)  
ADDRESS 70 W Madison St, Suite 5600  
Chicago, IL 60602

TAX MAP 65 Lot 123  
NAME Town of Exeter  
ADDRESS 10 Front Street  
Exeter, NH 03833

TAX MAP 65 Lot 123 Unit 1  
NAME Exeter Sportsman's Club  
ADDRESS P.O. Box 1936  
Exeter, NH 03833

TAX MAP Applicant  
NAME C/A Design, Inc. attn: Matt Van Zile  
ADDRESS 120 Northwest Blvd  
Nashua, NH 03063

TAX MAP Consulting Engineer  
NAME TFMoran, Inc. attn: Thomas C. Burns, P.E.  
ADDRESS 48 Constitution Drive  
Bedford, NH 03110

TAX MAP Surveyor  
NAME TFMoran, Inc. attn: Michael Dahlberg, LLS  
ADDRESS 48 Constitution Drive  
Bedford, NH 03110

TAX MAP Wetland Scientist  
NAME TFMoran, Inc. attn: Jason Aube, CWS  
ADDRESS 170 Commerce Way Suite 102  
Portsmouth, NH 03801

TAX MAP Soil Scientist  
NAME TES Env. Consultants, LLC attn: Tom Sokoloski, CSS  
ADDRESS 1494 Route 3A, Unit 1  
Bow, NH 03304

TAX MAP \_\_\_\_\_  
NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_

TAX MAP \_\_\_\_\_  
NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_

TAX MAP \_\_\_\_\_  
NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_

**Please attach additional sheets, if needed**



## SITE PLAN REQUIREMENTS

### 7.4 Existing Site Conditions Plan

Submission of this plan will not be applicable in all cases. The applicability of such a plan will be considered by the TRC during its review process as outlined in Section 6.5 Technical Review Committee (TRC) of these regulations. The purpose of this plan is to provide general information on the site, its existing conditions, and to provide the base data from which the site plan or subdivision will be designed. The plan shall show the following:

APPLICANT	TRC	REQUIRED EXHIBITS
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.1 Names, addresses, and telephone numbers of the owner, applicant, and person(s) or firm(s) preparing the plan.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.2 Location of the site under consideration, together with the current names and addresses of owners of record, of abutting properties and their existing land use.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.3 Title, date, north arrow, scale, and Planning Board Case Number.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.4 Tax map reference for the site under consideration, together with those of abutting properties.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.5 Zoning (including overlay) district references.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.6 A vicinity sketch or aerial photo showing the location of the land/site in relation to the surrounding public street system and other pertinent location features within a distance of 2,000-feet, or larger area if deemed necessary by the Town Planner.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.7 Natural features including watercourses and water bodies, tree lines, significant trees (20-inches or greater in diameter at breast height) and other significant vegetative cover, topographic features, and any other environmental features that are important to the site design process.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.8 Man-made features such as, but not limited to, existing roads, structures, and stone walls. The plan shall also indicate which features are to be retained and which are to be removed or altered.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.9 Existing contours at intervals not to exceed 2-feet with spot elevations provided when the grade is less than 5%. All datum provided shall reference the latest applicable US Coast and Geodetic Survey datum and should be noted on the plan.
<input type="checkbox"/>	<input type="checkbox"/>	7.4.10 A High Intensity Soil Survey (HISS) of the entire site, or appropriate portion thereof. Such soil surveys shall be prepared by a certified soil scientist in accordance with the standards established by the Rockingham County Conservation District. Any cover letters or explanatory data provided by the certified soil scientist shall also be submitted.

\*Site Specific Soils Mapping in lieu of HISS mapping



<input type="checkbox"/>	<input type="checkbox"/>	7.4.11 State and Federally designated wetlands, setback information, total wetlands proposed to be filled, other pertinent information and the following wetlands note: "The landowner is responsible for complying with all applicable local, state, and federal wetlands regulations, including any permitting and setback requirements required under these regulations."
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.12 Surveyed property lines including angles and bearings, distances, monument locations, and size of the entire parcel. A professional land surveyor licensed in New Hampshire must attest to said plan.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.13 The lines of existing abutting streets and driveway locations within 200-feet of the site.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.14 The location, elevation, and layout of existing catch basins and other surface drainage features.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.15 The shape, size, height, location, and use of all existing structures on the site and approximate location of structures within 200-feet of the site.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.16 The size and location of all existing public and private utilities, including off-site utilities to which connection is planned.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.17 The location of all existing easements, rights-of-way, and other encumbrances.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.18 All floodplain information, including the contours of the 100-year flood elevation, based upon the Flood Insurance Rate Map for Exeter, as prepared by the Federal Emergency Management Agency, dated May 17, 1982.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.19 All other features which would fully explain the existing conditions of the site.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.4.20 Name of the site plan or subdivision.



### 7.5 Proposed Site Conditions Plan (Pertains to Site Plans Only)

The purpose of this plan is to illustrate and fully explain the proposed changes taking place within the site. The proposed site conditions plan shall depict the following:

APPLICANT	TRC	REQUIRED EXHIBITS
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.5.1 Proposed grades and topographic contours at intervals not to exceed 2-feet with spot elevations where grade is less than 5%. All datum provided shall reference the latest applicable US Coast and Geodetic Survey datum and should be noted on the plan.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.5.2 The location and layout of proposed drainage systems and structures including elevations for catch basins.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.5.3 The shape, size, height, and location of all proposed structures, including expansion of existing structures on the site and first floor elevation(s). Building elevation(s) and a rendering of the proposed structure(s).
<input type="checkbox"/>	<input type="checkbox"/>	7.5.4 High Intensity Soil Survey (HISS) information for the site, including the total area of wetlands proposed to be filled.
<input type="checkbox"/>	<input type="checkbox"/>	7.5.5 State and Federally designated wetlands, setback information, total wetlands proposed to be filled, other pertinent information and the following wetlands note: "The landowner is responsible for complying with all applicable local, state, and federal wetlands regulations, including any permitting and setback requirements required under these regulations."
<input type="checkbox"/>	<input type="checkbox"/>	7.5.6 Location and timing patterns of proposed traffic control devices.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.5.7 The location, width, curbing and paving of all existing and proposed streets, street rights-of-way, easements, alleys, driveways, sidewalks and other public ways. The plan shall indicate the direction of travel for one-way streets. See Section 9.14 – Roadways, Access Points, and Fire Lanes for further guidance.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.5.8 The location, size and layout of off-street parking, including loading zones. The plan shall indicate the calculations used to determine the number of parking spaces required and provided. See Section 9.13 – Parking Areas for further guidance.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.5.9 The size and location of all proposed public and private utilities, including but not limited to: water lines, sewage disposal facilities, gas lines, power lines, telephone lines, cable lines, fire alarm connection, and other utilities.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.5.10 The location, type, and size of all proposed landscaping, screening, green space, and open space areas.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.5.11 The location and type of all site lighting, including the cone(s) of illumination to a measurement of 0.5-foot-candle.
<input type="checkbox"/>	<input type="checkbox"/>	7.5.12 The location, size, and exterior design of all proposed signs to be located on the site.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.5.13 The type and location of all solid waste disposal facilities and accompanying screening.

\*Site Specific Soils mapping in lieu of HISS mapping



<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.5.14 Location of proposed on-site snow storage.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.5.15 Location and description of all existing and proposed easement(s) and/or right-of-way.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.5.16 A note indicating that: "All water, sewer, road (including parking lot), and drainage work shall be constructed in accordance with Section 9.5 Grading, Drainage, and Erosion & Sediment Control and the Standard Specifications for Construction of Public Utilities in Exeter, New Hampshire". See Section 9.14 Roadways, Access Points, and Fire Lanes and Section 9.13 Parking Areas for exceptions.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.5.17 Signature block for Board approval

**OTHER PLAN REQUIREMENTS (See Section indicated)**

- 7.7 Construction plan
- 7.8 Utilities plan
- 7.9 Grading, drainage and erosion & sediment control plan
- 7.10 Landscape plan
- 7.11 Drainage Improvements and Storm Water Management Plan
- 7.12 Natural Resources Plan
- 7.13 Yield Plan





## SITE PLAN REVIEW APPLICATION CHECKLIST

A COMPLETED APPLICATION FOR SITE PLAN REVIEW MUST CONTAIN THE FOLLOWING

1. Application for Hearing ( x )
2. Abutter's List Keyed to Tax Map ( x )  
(including the name and business address of every engineer, architect, land surveyor, or soils scientist whose professional seal appears on any plan submitted to the Board)
3. Completed- " Checklist for Site Plan Review" ( x )
4. Letter of Explanation ( x )
5. Written Request for Waiver (s) from " Site Plan Review and Subdivision Regulations" (if applicable) ( x )
6. Completed "Preliminary Application to Connect and /or Discharge to Town of Exeter- Sewer, Water or Storm Water Drainage System(s)"( if applicable) ( x )
7. Planning Board Fees ( x )
8. Seven (7) full-sized copies of Site Plan ( x )
9. Fifteen (15) 11"x17" copies of the final plan to be submitted **TEN DAYS PRIOR** to the public hearing date. ( )
10. Three (3) pre-printed 1"x 2 5/8" labels for each abutter, the applicant and all consultants. ( x )

**NOTES:** All required submittals must be presented to the Planning Department office for distribution to other Town departments. Any material submitted directly to other departments will not be considered.

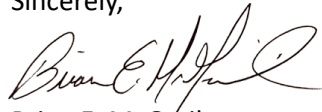
Brian E. McGrail  
70 W. Madison St., Suite 5600  
Chicago, IL 60602

2/23/2023

I/we, NH Exeter Properties, LLC, hereby certify that I/we are the owner(s) of the property at 131 Portsmouth Ave in Exeter, NH, and that I/we authorize CA Design, Wakefield Thermal, TFMoran, Inc., and their representatives to apply for all Local, State and Federal Permits required to develop the land as outlined in the attached application(s).

We further authorize CA Design, Wakefield Thermal, TFMoran, Inc., and their representatives to present the materials to the pertinent boards and agencies and further agree to allow them to access the property as necessary to perform their duties.

Sincerely,



Brian E. McGrail

Vice President, Secretary & Treasurer  
NH Exeter Properties, LLC



# TOWN OF EXETER, NEW HAMPSHIRE

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 • FAX 772-4709

[www.exeternh.gov](http://www.exeternh.gov)

DATE: February 13, 2018  
TO: Applicants  
FROM: Planning & Building Department  
RE: Preliminary Application to Connect and/or Discharge to Town of Exeter Sewer, Water and/or Storm Drainage System(s)

Attached is the "Preliminary Application to Connect and/or Discharge to Town of Exeter Sewer, Water or Storm Water Drainage System(s)". This Application form must be completed by the applicant or the applicant's authorized agent for projects that are subject to Planning Board approval or for a change of use. It is a prerequisite for submission of the "Applications for Sewer Service, Water Service and Storm Drainage Work." All of the application forms referenced above must be completed and approved prior to the issuance of a building permit. This application is intended to address a number of different scenarios and therefore, all sections may not be applicable to your particular situation. Please read the application carefully and fill out as completely as possible. If there are any questions, please feel free to contact the Planning and Building Department Offices. All forms must be submitted to the Planning and Building Department Office for review and distribution.

**Please Note: Any approval(s) granted in conjunction with this application will be valid for a period of one (1) year from the date of such approvals(s).**



**TOWN OF EXETER - DEPARTMENT OF PUBLIC WORKS**

**PRELIMINARY APPLICATION TO CONNECT AND/OR DISCHARGE TO TOWN OF EXETER  
SEWER, WATER, AND/OR STORMWATER DRAINAGE SYSTEM(S)**

Project Name C/A Design

Project Location 131 Portsmouth Avenue

Applicant/Owner Name NH Exeter Properties, LLC

Mailing Address 70 West Madison Street Suite 5600 Chicago, IL 60602

Phone Number \_\_\_\_\_ email mvanzile@wakefield-vette.com

Project Engineer TFMoran, Inc.

Mailing Address 48 Constitution Drive Bedford, NH 03110

Phone Number 603-472-4488 email tburns@tfmoran.com

Type of Discharge/Connection     Sewer     Water     Stormwater

Application completed by

Name    Thomas C. Burns, P.E./TFMoran, Inc.

Signature \_\_\_\_\_ Date \_\_\_\_\_

Reviewed and verified by Planning & Building Department \_\_\_\_\_

**DESIGN FLOWS**

The water and sewer design flow shall be based upon the New Hampshire Code of Administrative Rules, Env-Wq 1000 Subdivisions; Individual Sewage Disposal Systems, Table 1008-1 Unit Design Flow Figures (current version) or other methodology which may be deemed acceptable by the Town of Exeter. The minimum fee for a single-family residential unit is based on the design flow for two (2) bedrooms. Existing water and sewer flows may be based on meter readings for the current use.

If the proposed discharge is non-residential or is residential but exceeds 5,000 gallons per day (gpd), Section C must be completed. Certain water and sewer discharges must be approved by the State of New Hampshire Department of Environmental Services by way of permit and plan submittals. It is the responsibility of the applicant to ensure submittals are made to the state through the town is necessary. Final town approval cannot be made without the state’s approval if required.

Stormwater design flows are based on the drainage analysis prepared by the applicant using the most current published precipitation data available.

**APPROVALS ARE VALID FOR PERIOD OF ONE (1) YEAR FROM DATE OF APPROVAL**

**SECTION A: PROPOSED NEW CONNECTIONS OR MODIFICATION OF EXISTING CONNECTIONS**

**SANITARY SEWER**

---

Description of work Proposed 40,000 s.f. expansion of existing light industrial building.

Title of plan C/A Design Inc.

Total design flow (gpd) 2,500 gpd

*\*For any non-residential discharge or residential discharge exceeding 5,000 GPS, or for a change of use, complete Section C of this form.*

Approved \_\_\_\_\_ Date \_\_\_\_\_  
Water & Sewer Managing Engineer

**WATER**

---

Description of work Proposed 40,000 s.f. expansion of existing light industrial building.

Title of plan C/A Design Inc.

Total design flow (gpd) 2,500 gpd

Approved \_\_\_\_\_ Date \_\_\_\_\_  
Water & Sewer Managing Engineer

**STORMWATER**

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Description of work Proposed 40,000 s.f. expansion of existing light industrial building.

Title of plan C/A Design Inc.

Total design flow  
(10-year storm, CFS) .

Approved \_\_\_\_\_ Date \_\_\_\_\_  
Highway Superintendent

**APPROVALS ARE VALID FOR PERIOD OF ONE (1) YEAR FROM DATE OF APPROVAL**

**SECTION B: IMPACT FEES**

Provide the following information to determine if a water and/or sewer impact fee will be required for a new development or a change or increase in use.

**Current/prior Use(s)**

Describe current use(s) \_\_\_\_\_

<u>Use</u>	<u>Unit Flow (gpd)</u>	<u>Total Existing Flow</u>
Light Industrial (manufacturing & warehouse)	.	.
Total existing flow		.

**Proposed Use(s)**

Describe proposed use(s) \_\_\_\_\_

<u>Use</u>	<u>Unit Design Flow (gpd)</u>	<u>Total Design Flow</u>
Light Industrial (manufacturing & warehouse)	150 emp @ 10 gpd/emp.	1500 gpd
	1,000 gpd processed wastewater	1000 gpd
Total proposed flow		2500 gpd

**Impact Fees** (80% of the design flow)

Change in flow rate (gpd) 2500 gpd x 0.8 = Impact Fee flow rate (gpd) 2000

*If there is a decrease in flow rates, no water or sewer impact fee will be charged. If there is an increase in flow rates, a water and/or sewer impact fee will be charged using the following formula:*

Sewer Impact Fee: Flow increase (gpd) 2000 x \$4.85 = \$9700

Water Impact Fee: Flow increase (gpd) 2000 X \$2.00 = \$4000

**Approved by Town of Exeter**

Town Planner \_\_\_\_\_ Date \_\_\_\_\_  
 Water & Sewer Managing Engineer \_\_\_\_\_ Date \_\_\_\_\_

**APPROVALS ARE VALID FOR PERIOD OF ONE (1) YEAR FROM DATE OF APPROVAL**

**SECTION C: SANITARY SEWER CLASSIFICATION AND BASELINE MONITORING**

(NON-RESIDENTIAL DISCHARGES OR RESIDENTIAL DISCHARGE OVER 5,000 GPD)

In accordance with Title 40 of the Code of Federal Regulations, Part 403 Section 403.14, information provided herein shall be available to the public without restriction except as specified in 40 CFR Part 2. A discharge permit will be issued on the basis of the information provided in this section.

In accordance with all terms and conditions of the Town of Exeter, New Hampshire Ordinances Chapter 15, all persons discharging wastewater into the town's facilities shall comply with all applicable federal, state, and local Industrial Pre-treatment rules.

**PART I - USER INFORMATION**

Property Owner Name NH Exeter Properties, LLC  
Owner's Representative Matt Van Zile  
Address 70 West Madison Street Suite 5600 Chicago, Illinois 60602  
Phone (603) 635 5139 email mvanzile@wakefieldthermal.co  
Tenant Name C/A Design Inc.  
Address 180 Crosby Rd, Dover, NH 03820  
Phone . email mvanzile@wakefieldthermal.co

**PART II - PRODUCT OR SERVICE INFORMATION**

Products Manufactured Custom engineered cooling solutions, compact heat exchangers, and electronics enclosures for aerospace applications  
Services Provided .  
SIC Code(s) . Building Area (SF) 101,604 s.f.  
Number of Employees 150 Days/week of operation 7 Shifts per day 3

**PART III - CATEGORY OF SEWER DISCHARGE**

Type of Discharge  Septic  Proposed  Existing  Change of Use

Water Use (gpd) 2,500 gpd (from Section A)

Check all that apply:

Domestic waste only (toilets & sinks)

- Domestic waste plus some process wastewater
- Federal pre-treatment standards (40 CFR) applies

**PART IV - CLASSIFICATION DETERMINATION**

*(to be completed by Town staff)*

CLASS 1 - SIGNIFICANT OR CATEGORICAL INDUSTRIAL USER \_\_\_\_\_

CLASS 2 - MINOR INDUSTRIAL OR COMMERCIAL USER \_\_\_\_\_

CLASS 3 - INSIGNIFICANT INDUSTRIAL OR COMMERCIAL USER \_\_\_\_\_

CLASS 4 - NON-SYSTEM USER, OR DISCONTINUED SERVICE \_\_\_\_\_

*See attached sheet for the basis of the determination.*

Determined by \_\_\_\_\_ Title \_\_\_\_\_ Date \_\_\_\_\_

Approved \_\_\_\_\_ Date \_\_\_\_\_

Water & Sewer Managing Engineer

**PART V - CERTIFICATION**

I have personally examined and am familiar with the information submitted in this section for the above name use. The information provided is true, accurate and complete. I am aware that there are significant penalties from federal, state and/or town regulatory agencies for submitting false information, including the possibility of fine and/or imprisonment.

I acknowledge and agree to pay all charges incurred for monitoring, testing and subsequent analysis performed on the Town of Exeter sewer, water and/or stormwater drainage system(s), in the course of determining the town's ability to serve the project. Further, I acknowledge and agree that failure to accurately declare said flow requirements shall be sufficient cause to deny access to the Town of Exeter sewer, water and/or stormwater drainage system(s).

Signature of Applicant \_\_\_\_\_ Date 2/27/2023

Name of Property Owner NH Exeter Properties, LLC



## USER CLASSIFICATION SYSTEM FOR INDUSTRIAL DISCHARGE

### CLASS 1: SIGNIFICANT INDUSTRIAL USER

Any industry and/or commercial establishment that:

- Is subject to National Pre-treatment standards as outlined in 40 CFR (Code of Federal Regulations) 403.5 (a) (b).
- Discharges a non-domestic waste stream of 5,000 GPD, or more.
- Contributes a non-domestic waste stream totaling 5% or more of the average dry weather hydraulic or organic (BOD<TSS< etc.) capacity of the Town of Exeter Sewer Treatment Facility.
- Has the reasonable potential, in the opinion of the POT Supervisor, to adversely affect the treatment plant, its workers, or the collection system by reason of inhibition, pass- through pollutants, or sludge contamination.

### CLASS 2: MINOR INDUSTRIAL USERS

Small industries and commercial establishments (e.g. restaurants, auto repair shops, cleaners, etc.) whose individual discharges do not significantly impact the Town of Exeter Sewer Treatment Facility or systems, degrade receiving water quality or contaminate the sludge. Industries that have the potential to discharge a non-domestic or process waste stream, but at the present time discharge only sanitary waste, may also be included in this class. However, this class shall not include any categorical industries. Industries and commercial establishments in this classification will require a permit and be subject to all inspection, compliance monitoring, enforcement, and reporting requirements of the pretreatment program.

### CLASS 3: INSIGNIFICANT INDUSTRIAL USERS

Users which will be eliminated from participation in Exeter's Pretreatment Program. These include industries and/or commercial establishments that discharge only domestic waste (toilets and sinks only) into the municipal sewer system or do not have any reasonable chance of discharging a non-domestic waste stream to the POTW. Class 3 users will be required to notify the Exeter Sewer Division of any change in discharge quantity or character.

### CLASS 4: NON-SYSTEM USER

Any industry, business or commercial establishment identified in the Master List of Industrial Users that are not connected to the Exeter Sewer system or which has ceased to discharge to the system.

Industries and/or commercial establishments classified as Class 1 or Class 2 users will be regulated individually and have specific effluent limitations (including conventional pollutants, where necessary) in the discharge permit. All Class 1 and Class 2 users will require a State Discharge Permit, and be subject to all inspection, compliance monitoring, and enforcement and reporting requirements of the pretreatment program.



Civil Engineers  
Structural Engineers  
Traffic Engineers  
Land Surveyors  
Landscape Architects  
Scientists

## TRAFFIC MEMORANDUM

Date: 27 February 2023

To: Town of Exeter  
Planning Department  
10 Front Street  
Exeter, NH 03833

From: Robert Duval, P.E.

Re: **Proposed Manufacturing Expansion Project**  
**131 Portsmouth Avenue (Lot 52/112) Exeter NH**  
TFM Project No. 45659.51

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### **INTRODUCTION**

TFMoran has prepared this traffic memo to evaluate trip generation and describe the existing roadway network associated with expansion of an existing manufacturing facility at 131 Portsmouth Avenue in Exeter, New Hampshire.

C/A Design, Inc. is proposing to renovate and expand the existing manufacturing building at the location described above in Exeter, NH. The project includes a 40,000 sf addition to the existing 74,000 sf manufacturing building and constructing new parking to provide a total of 153 parking spaces. The ultimate employee count will be 150 onsite employees at peak production after the expansion.

The project includes construction of a new driveway access to Holland Way (NH88) and retaining the existing private access way (GTE Drive) onto Portsmouth Avenue. The new driveway onto Holland Way will be the primary access point for staff and truck traffic to the facility.

### **DESCRIPTION OF SITE**

The existing 9-acre site is zoned Corporate Technology Park (CT) and Highway Commercial (C-2), and is occupied by an existing 74,000 sf manufacturing facility. Currently the only driveway access is via GTE Road to Portsmouth Ave, shared with the remaining Osram Sylvania building to the southeast, and undeveloped land owned by The Kane Company to the west.

## **DESCRIPTION OF ROADWAYS AND INTERSECTIONS**

### *Portsmouth Avenue*

- **Classification.** Portsmouth Avenue (NH108) is a State-maintained roadway that runs from High Street (NH27) at the south to the Spaulding Turnpike at the north.
- **AADT volume** collected by NHDOT on NH108 at Wheelwright Creek just south of GTE Rod shows 17,644 vehicles per day (2021).
- **Lane widths and usage.** In the project vicinity, the roadway generally provides one 12' travel lane in each direction with two turning lanes down the center of the roadway, with 10' shoulders.
- **Pedestrian facilities.** There are sidewalks along both sides of the roadway.
- **Signage.** The speed limit is posted at 30 mph. There is minimal traffic signage along the roadway. Pavement markings consist of a double-yellow centerline, a single yellow/skip line on both sides and solid white shoulder lines, in fair to good condition.
- **Lighting.** Cobra-head LED roadway lighting is provided along the roadway.
- **Road conditions.** The roadway is generally level with flat curves, closed drainage and normal crown. The pavement is in fair to good condition with minor cracking and little or no structural defects evident.
- **Adjacent uses** include primarily retail and commercial activities.

### *Holland Way (NH88)*

- **Classification.** Holland Way (NH Route 88) is a State-maintained local roadway that parallels GTE Road. The roadway connects from Portsmouth Ave at the north to Hampton Road (NH27) at the south.
- **AADT volume** collected by NHDOT on Hollard Way (NH88) just south of the site shows 5,248 vehicles per day (2021).
- **Lane widths and usage.** In the project vicinity, the roadway generally provides one 12' travel lane in each direction, with 10' shoulders. There are several turn lanes provided at developed intersections at the northern end of the roadway.
- **Pedestrian facilities.** There are sidewalks along the north side of the roadway.
- **Signage.** The speed limit is posted at 35 mph. There are lane use signs and highway directional signs along the roadway, a signal ahead sign and Stop signs and street signs at intersections. Pavement markings consist of a double-yellow centerline and solid white shoulder markings, in fair to good condition.
- **Lighting.** No roadway lighting is provided in the study area.
- **Road conditions.** The roadway is generally level with gentle curves and a combination of closed and open drainage with normal crown. The pavement is in good condition with minor cracking with no significant structural defects evident.
- **Adjacent uses** include include : retail and commercial.

### *GTE Road*

- **Classification.** GTE Road is a Private roadway that provides access from Portsmouth Avenue to two existing manufacturing buildings.

- Lane widths and usage. The roadway provides one 12' travel lane into the manufacturing site and two lanes exiting the site, with no shoulders.
- Pedestrian facilities. There are no sidewalks along Gte Road.
- Signage. A reduce speed sign and a no trespassing sign are placed prior to the buildings. There is no other traffic signage except Stop sign at the Portsmouth Ave intersection. Pavement markings consist of a double-yellow centerline and a white skipped line between the two exiting lanes, in fair to good condition.
- Lighting. Roadway lighting is provided.
- Road conditions. The roadway is generally level with flat curves, open drainage and normal crown. The pavement is in fair condition with minor cracking, with minor rutting and potholes, but no significant structural defects.
- Adjacent uses include: Manufacturing, a car dealership, a shopping center to the northeast, and vacant land to the north and Exeter Reservoir to the south.

### **TRIP GENERATION AND DISTRIBUTION**

Trip generation rates published by the ITE (11<sup>th</sup> Edition) for Land Use Code (LUC) 140, Manufacturing, was used to calculate the vehicle trips for the existing and proposed manufacturing building plus addition. The table below shows the existing and total proposed trip generation.

**Table 1: Proposed Trip Generation - GFA**

	In	Out	Total
<b>Total Manufacturing Building: 110,000 sf</b>			
Weekday AM Peak Hour of Adjacent Street	59	18	77
Weekday PM Peak Hour of Adjacent Street	26	59	85
Weekend SAT Peak Hour of the Generator	11	10	21
<b>Existing Manufacturing Building: 74,000 sf</b>			
Weekday AM Peak Hour of Adjacent Street	38	12	50
Weekday PM Peak Hour of Adjacent Street	17	38	55
Weekend SAT Peak Hour of the Generator	7	6	13
<b>Proposed New Trips</b>			
<b>Manufacturing Building Addition: Proposed 40,000 sf</b>			
Weekday AM Peak Hour of Adjacent Street	21	6	27
Weekday PM Peak Hour of Adjacent Street	9	21	30
Weekend SAT Peak Hour of the Generator	4	3	7

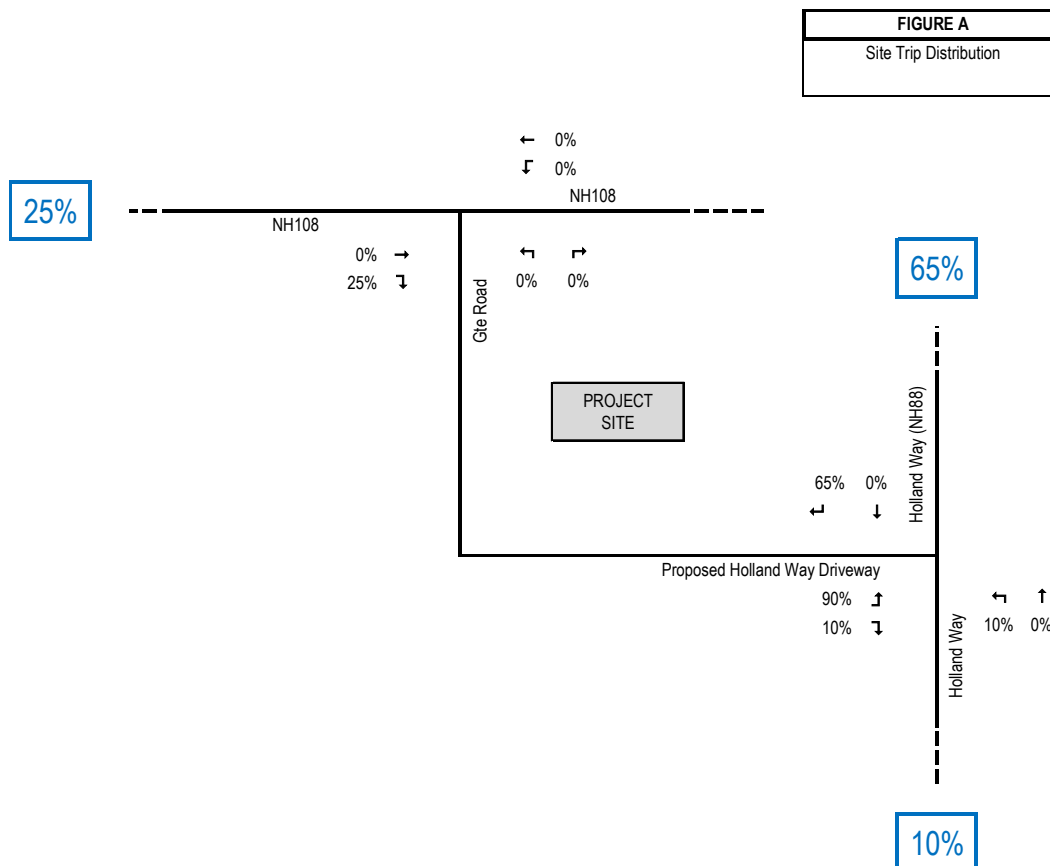
**Table 2: Proposed Trip Generation – Employees**

	In	Out	Total
<b>Total Manufacturing Building – 150 Employees</b>			
Weekday AM Peak Hour of Adjacent Street	48	18	66
Weekday PM Peak Hour of Adjacent Street	24	41	65
Weekend SAT Peak Hour of the Generator	8	7	15

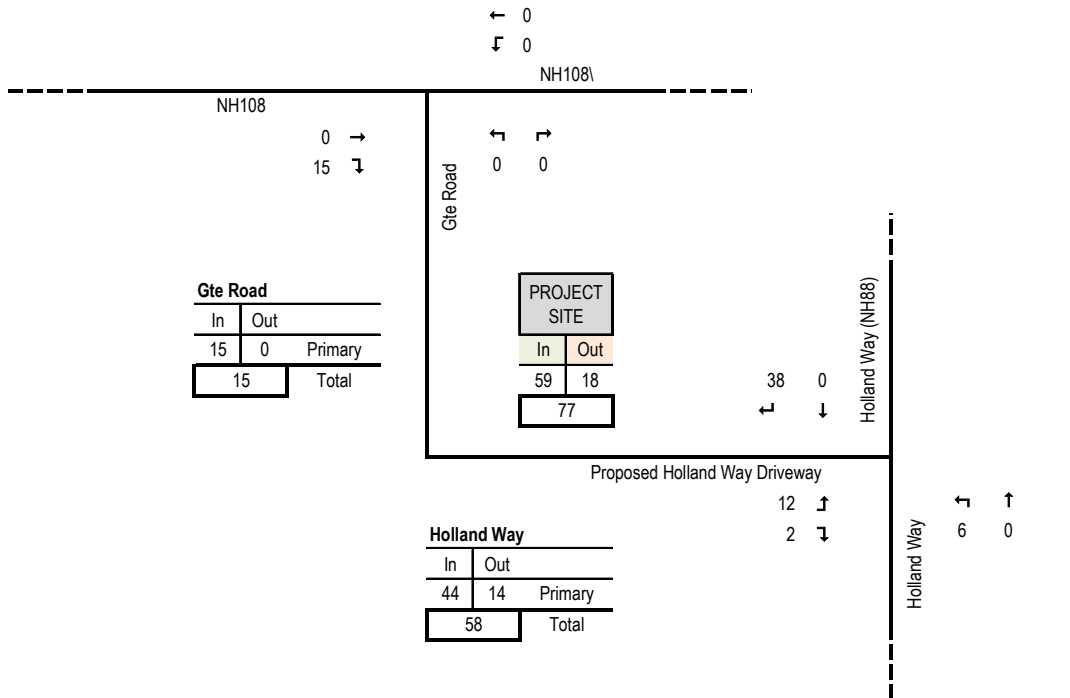
### Trip Distribution

Using NHDOT MS2 data as reference, it is estimated that the following distribution would result from the development on NH108 and Holland Way in the project area.

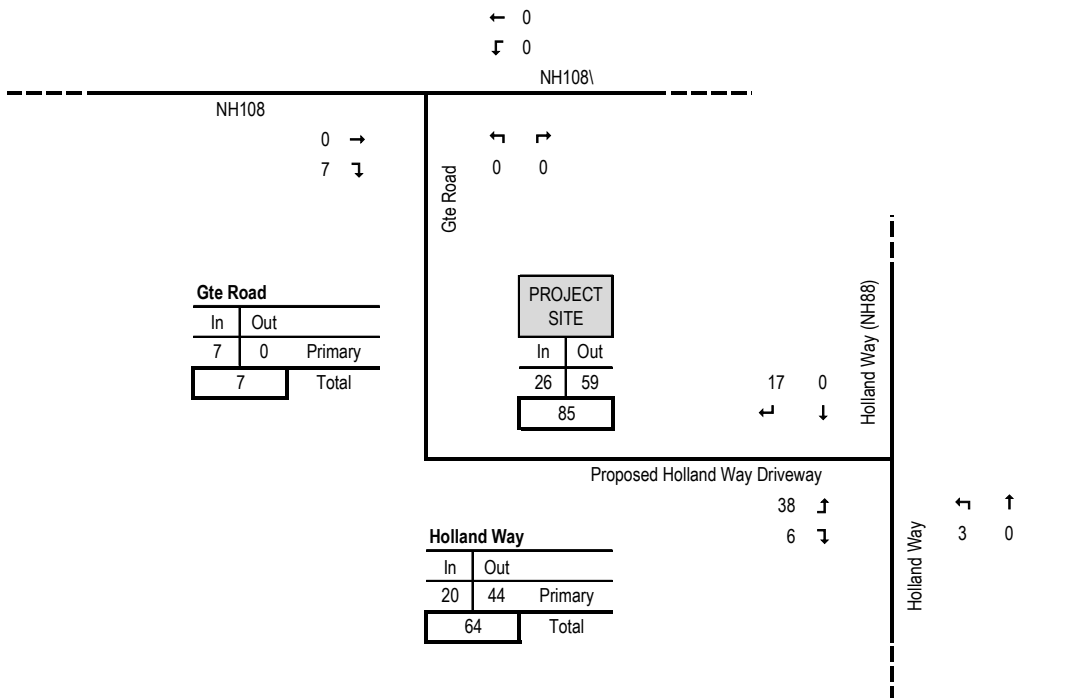
- 65% to/from the east (NH108 & NH101)
- 25% to/from the west (NH108)  
These trips are likely to enter via GTE Road as right turn off of NH108. However, left turns out of GTE Road are difficult as a very busy corridor, so these trips are expected to exit via Holland Way and take a left turn onto NH108 westbound at the traffic signal.
- 10% to/from the south (Holland Way/NH88)



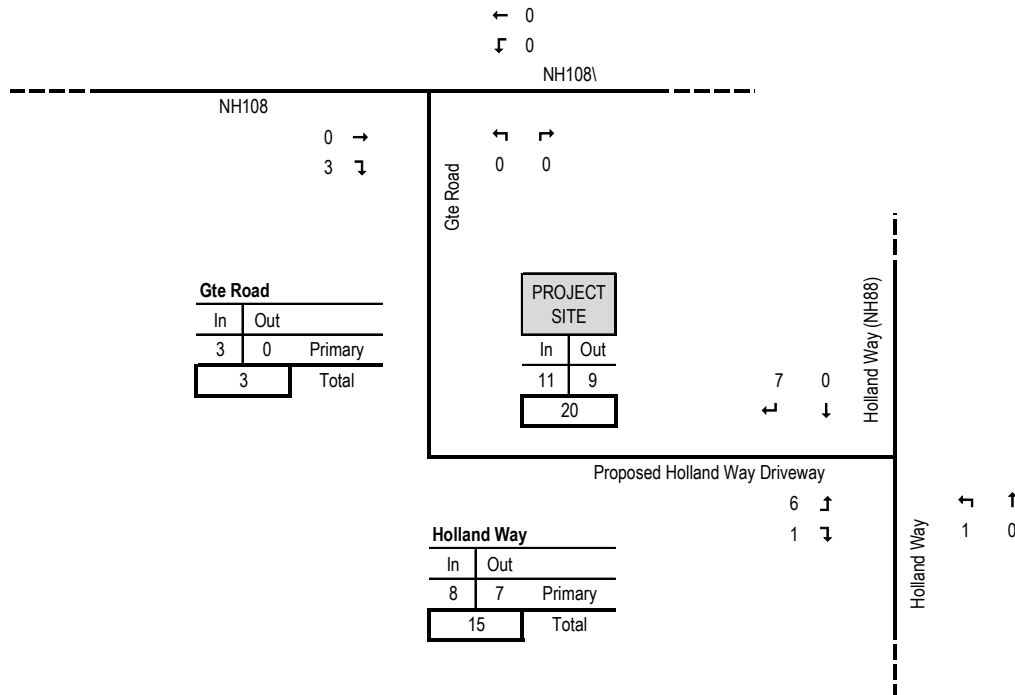
**FIGURE 1**  
 Site Trips  
 AM Peak Hour



**FIGURE 2**  
 Site Trips  
 PM Peak Hour



**FIGURE 3**  
 Site Trips  
 SAT Peak Hour



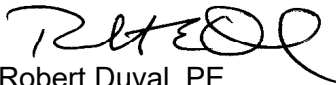
**CONCLUSION**

Based on the foregoing, we anticipate the impacts associated with traffic from this project to be minimal. The traffic generated by this expanded facility includes 77 trips during the AM peak hour, and 85 trips in PM peak hour, that is, about 1.5 trips per minute. The majority of those trips would be generated by re-occupation of the existing facility itself, with the expansion accounting for only 27 AM peak hour trips and 30 PM trips. Saturday generation is negligible (15 total peak hour trips).

The increase in peak hour volume along NH108 south of Holland Way is also negligible at 15 AM and 7 PM trips, representing less than 1% of existing traffic volume, and well within the typical daily variation in traffic on the roadway (approximately 100 trips per day). On Holland Way itself, the new traffic will be approximately 50 to 60 trips (about a 10% increase) in the AM/PM peak hours, and comparable to the typical existing daily variation of approximately 50 trips. All area intersections are sized appropriately to accommodate these expected volumes with minimal impact to delays and queue lengths.

In summary, we find that the adjacent roadway network can be expected to safely accommodate the traffic associated with this proposal without need for offsite mitigation.

Respectfully submitted,  
**TFMORAN, INC.**

  
 Robert Duval, PE  
 Chief Engineer

**Existing Trip Generation**  
*Based on ITE Trip Generation 11th Edition*

**ITE LUC 140 - Manufacturing: 74,000 sf**

Time Period	Variable: SF		Rate /Eq Used	Trip Ends	Directional Split*		Directional Distribution		Total
	X	Rate			In	Out	In	Out	
Weekday AM Peak Hour Adjacent Street	74	0.68	Rate	50	76%	24%	38	12	50
Weekday PM Peak Hour Adjacent Street	74	0.74	Rate	55	31%	69%	17	38	55
Weekend SAT Peak Hour of Generator	74	0.18	Rate	13	52%	48%	7	6	13
Weekday Daily	74	4.7	Rate	348	50%	50%	174	174	348
Weekend (SAT) Daily	74	1.49	Rate	110	50%	50%	55	55	110

**Proposed Trip Generation**  
*Based on ITE Trip Generation 11th Edition*

*Proposed Addition*

**ITE LUC 140 - Manufacturing: 40,000 sf**

Time Period	Variable: SF		Rate/ Eq Used	Trip Ends	Directional Split		Directional Distribution		Total
	X	Rate			In	Out	In	Out	
Weekday AM Peak Hour Adjacent Street	40	0.68	Rate	27	76%	24%	21	6	27
Weekday PM Peak Hour Adjacent Street	40	0.74	Rate	30	31%	69%	9	21	30
Weekend SAT Peak Hour of Generator	40	0.18	Rate	7	52%	48%	4	3	7
Weekday Daily	40	4.7	Rate	188	50%	50%	94	94	188
Weekend (SAT) Daily	40	1.49	Rate	60	50%	50%	30	30	60

**Project Total Trips (SF)**

<b>AM</b>	In	Out	Total
Existing + Proposed = Total Trips	59	18	77
Existing Manufacturing	21	6	27
<b>Proposed Manufacturing (New Trips)</b>	<b>38</b>	<b>12</b>	<b>50</b>

<b>PM</b>	In	Out	Total
Existing + Proposed = Total Trips	26	59	85
Existing Manufacturing	9	21	30
<b>Proposed Manufacturing (New Trips)</b>	<b>17</b>	<b>38</b>	<b>55</b>

<b>SAT</b>	In	Out	Total
Existing + Proposed = Total Trips	11	9	20
Existing Manufacturing	4	3	7
<b>Proposed Manufacturing (New Trips)</b>	<b>7</b>	<b>6</b>	<b>13</b>



<b>Total Trip Generation</b>
<i>Based on ITE Trip Generation 11th Edition</i>

Total Building

**ITE LUC 140 - Manufacturing: 150 Employees**

Time Period	Variable: Employees		Rate/ Eq Used	Trip Ends	Directional Split		Directional Distribution		Total
	X	Rate			In	Out	In	Out	
Weekday AM Peak Hour Adjacent Street	150	***	Rate	66	73%	27%	48	18	<b>66</b>
Weekday PM Peak Hour Adjacent Street	150	****	Rate	65	37%	63%	24	41	<b>65</b>
Weekend SAT Peak Hour of Generator	150	0.1	Rate	15	52%	48%	8	7	<b>15</b>
Weekday Daily	150	.	EQ	464	50%	50%	232	232	<b>464</b>
Weekend (SAT) Daily	150	**	Rate	413	50%	50%	207	206	<b>413</b>

Equation \*  $\ln(T) = 0.89 \ln(X) + 1.68$

Equation \*\*  $T = 0.30(X) + 368.17$

Equation \*\*\*  $T = 0.24(X) + 29.47$

Equation \*\*\*\*  $T = 0.21(X) + 33.45$



Civil Engineers  
 Structural Engineers  
 Traffic Engineers  
 Land Surveyors  
 Landscape Architects  
 Scientists



45659.51

February 14, 2023

**Re: Areas Not Jurisdictional Under the Wetlands Conservation Overlay District – 131  
 Portsmouth Ave – Wakefield Thermal**

Town of Exeter  
 Planning Board and Conservation Commission  
 10 Front Street  
 Exeter, NH 03833

To Whom It May Concern:

This letter is in reference to the aforementioned property, more specifically referenced on the Town of Exeter Assessor Map as Tax Map: 52, Lot: 112A. On July 27, 2022, we assessed the property for the presence of wetlands as defined within the Town of Exeter Zoning Ordinance, more specifically defined within Article 2.2.86 and as defined within NH Wetlands Law, RSA 482-A:2 and the associated Administrative Rules, specifically, Env-Wt 406. On December 5, 2022, we returned to the site and delineated the wetlands.

As a result of our field inspection and subsequent formal delineations, we determined that while the wet areas on the property are jurisdictional under NH Wetlands Law, they are not areas jurisdictional under the Article 9 of the Town of Exeter Wetland Conservation District. Specifically, under Article 9.1.3.D, man made drainage structures, detention ponds and drainage swales are not part of the Wetlands Protection Overlay District.

We have included a photo exhibit and photo orientation key for your review that depict these man-made systems. Should you have any questions, you're welcome to contact me anytime.

Respectfully,  
**TFMoran, Inc.**

*Jason Aube*

Jay Aube  
 Certified Wetland Scientist #313





Civil Engineers  
 Structural Engineers  
 Traffic Engineers  
 Land Surveyors  
 Landscape Architects  
 Scientists

**NEW HAMPSHIRE**  
**200**

45659.50

## Photo Exhibit

**Date of Inspection:** July 27, 2022

**Property Location:** 131 Portsmouth Ave, Exeter, NH – Tax Map: 52, Lot: 112A



**Photo: 1** – Low functioning, low value resource below utility lines.



**Photo: 2** – Low functioning, low value resource below utility lines.

TFMoran, Inc.  
 48 Constitution Drive, Bedford, NH 03110  
 T(603) 472-4488      www.tfmoran.com



TFMoran, Inc. Seacoast Division  
 170 Commerce Way–Suite 102, Portsmouth, NH 03801  
 T(603) 431-2222



**Photo: 3** – Low functioning, low value ditched area at toe of slope with invasive species.



**Photo: 4** – Low functioning, low value ditched area at toe of slope with invasive species.



**Photo: 5 – Detention-pond and outflow structure**



**Photo: 6 – Detention-pond with invasive species.**



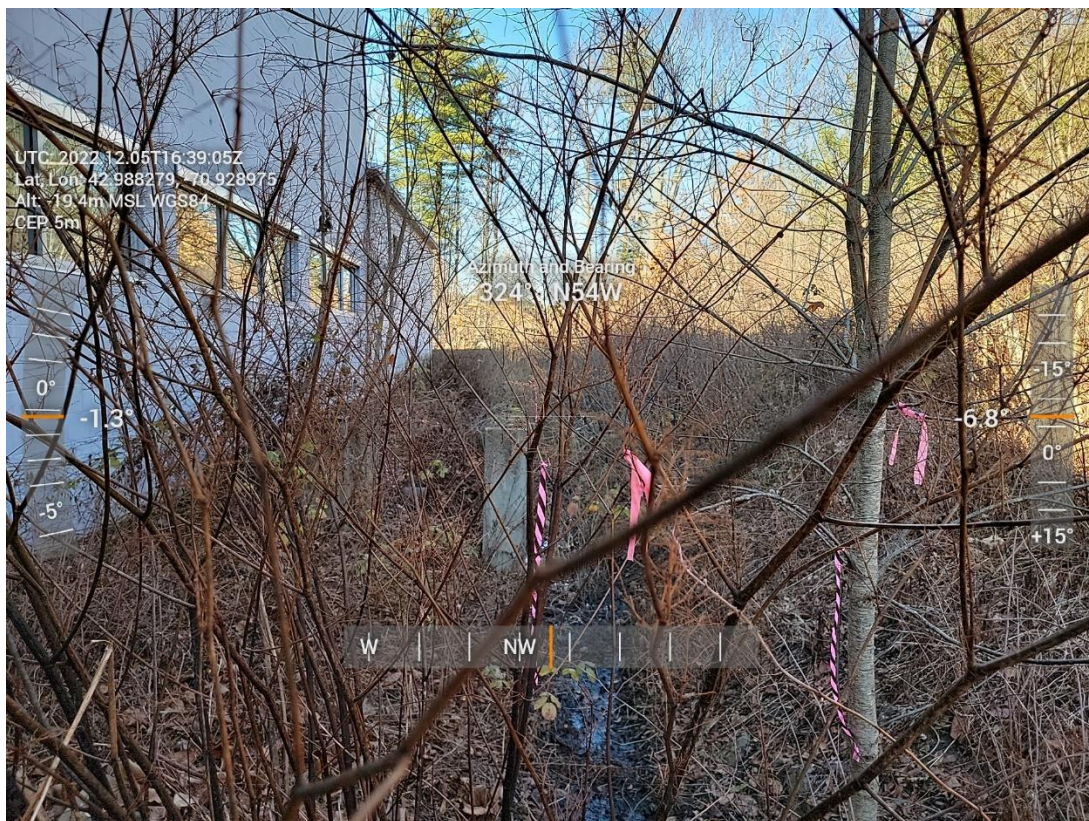
Photo: 7 – Detention-pond with invasive species.



Photo: 8 – Roadside ditch diverting sheet flow to the detention-pond.

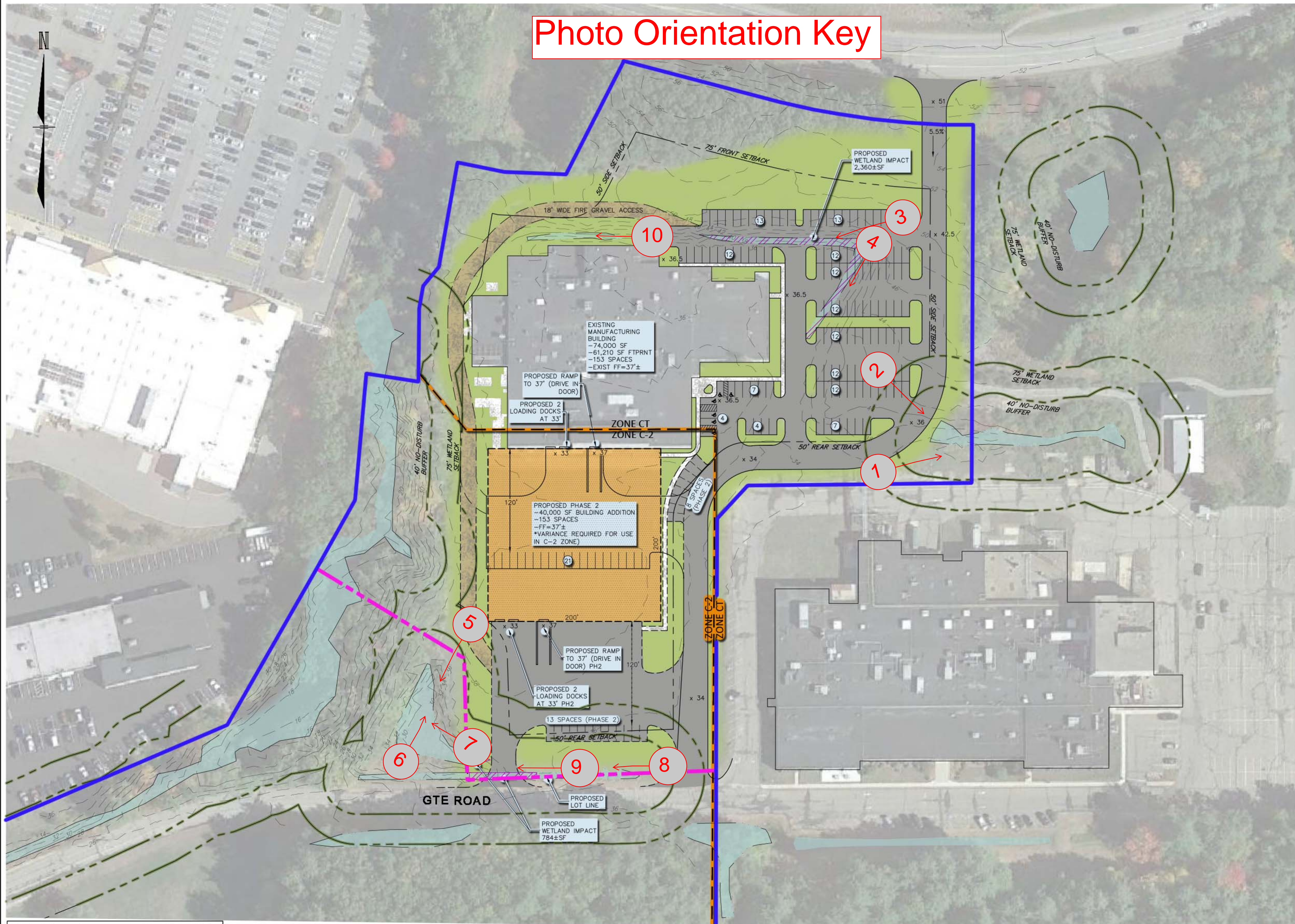


**Photo: 9** – Roadside ditch diverting sheet flow to the detention-pond. Invasive species present.



**Photo: 10** – Ditch adjacent to existing structure.

# Photo Orientation Key



## REFERENCE PLANS

1. ALJA/NSP/SALMAN/SPEL/SURVEY/PLANS FOR THE F&B BOBBER. QSMAN 0510/SARAM INSL/VOL/IN/COB/PORTSMOUTH NH/05/15/2019. BOARDING W/01 EXETER, NH. DATED OCTOBER 2019, BY DOUCET SURVEY LLC. JOB NUMBER 6088.

## NOTES

- CURRENT ZONING IS CORPORATE TECHNOLOGY PARK (CT) & HIGHWAY COMMERCIAL (C-2) ZONING DISTRICTS.
 

	REQUIRED CT/C-2	PROVIDED CT (MORE RESTRICTIVE ZONE)
MIN. LOT SIZE:	4 AC./20,000 SF	9.0± AC.
MIN. LOT FRONTAGE:	400'/150'	413±'
MIN. BUILDING SETBACKS:		
FRONT	75'/50'	195.4'
SIDE	50'/20'	51'
REAR	50'/50'	175'
MAX. BUILDING HEIGHT:	50'/35'	TDB
MAX. BUILDING COVERAGE:	20%/30%	25.6% *VARIANCE REQUIRED (PH. 2)
MIN. OPEN SPACE:	35%/15%	41%
WETLAND SETBACK:	75'	<75' *VARIANCE REQUIRED
- PARKING CALCULATIONS:  
REQUIRED: MANUFACTURING: 1 SP. EMPLOYEE ON LARGEST SHIFT (150 EML) = 150 SPACES (ASSUMED)  
PROPOSED: 153 SPACES
- THE PROPERTY WILL BE SERVICED BY THE FOLLOWING SERVICES:  
DRAINAGE: PRIVATE  
SEWER: MUNICIPAL  
WATER: MUNICIPAL  
GAS: LIBERTY UTILITIES  
ELECTRIC: EVERSOURCE  
TELEPHONE: CONSOLIDATED  
CABLE: COMCAST
- EXAMINATION OF THE FLOOD INSURANCE RATE MAP FOR THE TOWN OF EXETER, NEW HAMPSHIRE, COMMUNITY PANEL NUMBER 330150046, EFFECTIVE DATE: 5-17-2005, INDICATES THAT THE SUBJECT PARCEL IS NOT LOCATED WITHIN A FLOOD HAZARD AREA.
- WETLAND IMPACTS WILL REQUIRE AN APPLICATION TO NHDES WETLANDS BUREAU AND A VARIANCE FROM THE TOWN ZONING BOARD OF ADJUSTMENTS. OBTAINING THESE PERMITS WILL DEPEND ON THE WETLAND FUNCTION AND VALUES, AND SENSITIVITY OF THE PROJECT.
- TESTING FOR SUITABLE AREAS FOR SEPTIC SYSTEMS AND WELLS WILL BE REQUIRED TO CONFIRM THAT SERVICES CAN BE PROVIDED ON SITE, AND/OR AVAILABLE MUNICIPAL SEWER AND WATER CAPACITY WILL NEED TO BE VERIFIED DURING THE DESIGN PROCESS.
- SITE DEVELOPMENT MAY REQUIRE RETAINING WALLS FOR GRADE CHANGES.
- EASEMENTS, RIGHTS, AND RESTRICTIONS SHOWN ARE THOSE WHICH IDENTIFIED BASED ON DATA USED IN CONCEPTUAL DESIGN. OTHER RIGHTS, EASEMENTS, OR RESTRICTIONS MAY EXIST WHICH DEED RESEARCH AND A TITLE EXAMINATION OF SUBJECT PARCEL(S) WOULD DETERMINE.
- THE LOCATION OF ANY UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. TFMORAN INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE AT 1-888-344-7233.
- A COMPLETE EXISTING CONDITIONS SURVEY AND SITE DESIGN CONSIDERATIONS MAY IMPACT SQUARE FOOTAGE, BUILDING ENVELOPE AND SITE LAYOUT.
- INFORMATION DEPICTED ON THIS PLAN IS NOT A RESULT OF A SURVEY CONDUCTED BY TFMORAN INC. THIS PLAN IS SOLELY FOR CONCEPTUAL PURPOSES.

This plan is for conceptual purposes only. It is not necessarily the result of a complete on-site survey, nor is it intended for construction uses. Locations of boundaries and wetlands are approximate, and not necessarily correct or accurate. Compliance with current regulations must be verified.

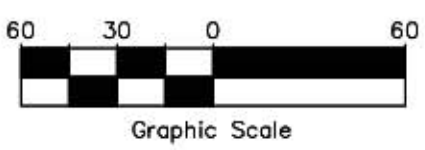
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TAX MAP 52 LOT 112  
**CONCEPTUAL SITE PLAN 'A'**  
 131 PORTSMOUTH AVE.  
 EXETER, NH  
 OWNED BY  
 131 PORTSMOUTH AVE LLC  
 PREPARED FOR  
**WAKEFIELD THERMAL**

SCALE: 1"=60' JULY 15, 2022



REV.	DATE	DESCRIPTION	DR	CK

**TFM** Civil Engineers  
 Structural Engineers  
 Traffic Engineers  
 Land Surveyors  
 Landscape Architects  
 Scientists

48 Constitution Drive  
 Bedford, NH 03110  
 Phone (603) 472-4488  
 Fax (603) 472-9747  
 www.tfmoran.com

DR MSK FB  
 CK RED CADFILE  
 BUS. DEVEL.

CONCEPT A



# GENERAL INFORMATION

**OWNER**  
 MAP 52 LOT 112A  
 NH EXETER PROPERTIES, LLC  
 C/O MATT VAN ZILE  
 70 W. MADISON ST, SUITE 5600  
 CHICAGO, IL 60602

**APPLICANT**  
 C/A DESIGN, INC.  
 C/O MATT VAN ZILE  
 (WAKEFIELD THERMAL)  
 120 NORTHWEST BLVD  
 NASHUA, NH 03063

**PREPARED FOR**  
 WAKEFIELD THERMAL, INC.  
 C/O MATT VAN ZILE  
 120 NORTHWEST BLVD  
 NASHUA, NH 03063

**RESOURCE LIST**

**PLANNING DEPARTMENT**  
 10 FRONT ST  
 EXETER, NH 03822  
 603-772-4709  
 DAVE SHARPLES, TOWN PLANNER

**CONSERVATION COMMISSION**  
 10 FRONT ST  
 EXETER, NH 03822  
 603-772-4709  
 KRISTIN MURPHY, CONSERVATION AND SUSTAINABILITY PLANNER

**BUILDING DEPARTMENT**  
 10 FRONT ST  
 EXETER, NH 03822  
 603-772-4709  
 DOUG EASTMAN, BUILDING INSPECTOR, CODE ENFORCEMENT OFFICER

**PUBLIC WORKS**  
 13 NEWFIELDS ROAD  
 EXETER, NH 03822  
 603-773-6157  
 PAUL VLASICH, P.E., TOWN ENGINEER, INTERIM PUBLIC WORKS DIRECTOR

**POLICE DEPARTMENT**  
 20 COURT STREET  
 EXETER, NH 03822  
 603-778-7061  
 STEPHAN POULIN, CHIEF

**FIRE DEPARTMENT**  
 20 COURT STREET  
 EXETER, NH 03822  
 603-773-6128  
 ERIC WILKING, CHIEF

**ASSOCIATED PROFESSIONALS**

**CIVIL ENGINEER**  
 TFMORAN, INC.  
 48 CONSTITUTION DRIVE  
 BEDFORD, NH 03110  
 THOMAS C. BURNS, P.E., SR. PROJECT MANAGER

**ARCHITECT**  
 AHP ARCHITECTS  
 116 JOHN STREET, SUITE 115  
 LOWELL, MA 01852  
 978-244-1100  
 ALICIA MARKEY, PROJECT ARCHITECT

**WETLAND SCIENTIST**  
 TFMORAN, INC.  
 170 COMMERCE WAY, SUITE 102  
 PORTSMOUTH, NH 03801  
 603-431-2222  
 JASON AUBE, CWS

**SOILS SCIENTIST**  
 TES ENVIRONMENTAL CONSULTANTS, LLC  
 1494 ROUTE 3A, UNIT 1  
 BOW, NH 03304  
 603-856-8925  
 THOMAS E. SOKOLOSKI, CSS

**LIGHTING DESIGN**  
 EXPOSURE LIGHTING  
 6 SCOTT ROAD, UNIT A  
 HAMPTON, NH 03842  
 603-601-8080  
 KEN SWEENEY

**ABUTTERS**

TAX MAP 51 LOT 14 UNIT 1  
 MCFARLAND REALTY TRUST  
 151 PORTSMOUTH AVE.  
 EXETER, NH 03833

TAX MAP 51 LOT 15  
 KEVIN KING ENTERPRISES  
 PO BOX 6500  
 CLARISE, PA 17013

TAX MAP 51 LOT 17  
 ONE FOUR SIX POST ROAD LLC  
 151 PORTSMOUTH AVE  
 EXETER NH 03833

TAX MAP 52 LOT 51  
 S A F REALTY LLC  
 100 PORTSMOUTH AVE  
 EXETER, NH 03833

TAX MAP 52 LOT 52  
 108 HEIGHTS LLC  
 65 POST ROAD  
 HOOKSETT, NH 03106

TAX MAP 52 LOT 53  
 EXETER LUMBER  
 120 PORTSMOUTH AVE  
 EXETER, NH 03833

TAX MAP 52 LOT 111  
 FOSS LAURENCE D  
 30 BUNKER HILL AVE.  
 STRATHAM, NH 03885

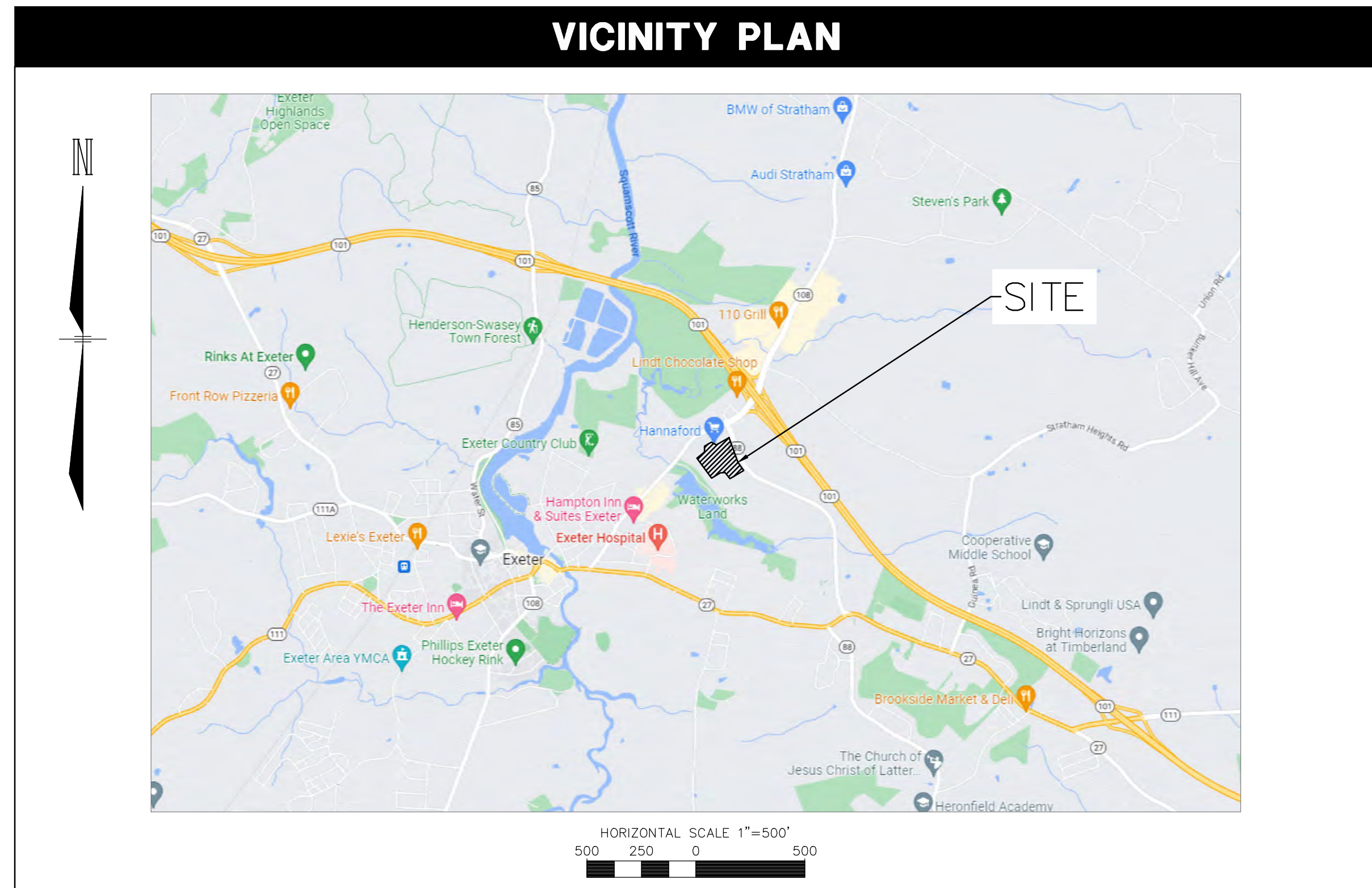
TAX MAP 52 LOT 112 - 1  
 NH EXETER PROPERTIES LLC  
 70 W MADISON ST, SUITE 5600,  
 CHICAGO, IL 60602

TAX MAP 65 LOT 123  
 TOWN OF EXETER  
 10 FRONT STREET,  
 EXETER, NH 03833

TAX MAP 65 LOT 123 UNIT 1  
 EXETER SPORTSMAN'S CLUB  
 PO BOX 1936,  
 EXETER, NH 03833

# C/A DESIGN, INC. BUILDING EXPANSION

**131 PORTSMOUTH AVENUE  
 EXETER, NEW HAMPSHIRE**



### INDEX OF SHEETS

SHEET	SHEET TITLE
C-1	COVER
C-2	EXISTING CONDITIONS PLAN
C-3	SITE PREPARATION PLAN
C-4	SITE LAYOUT PLAN
C-5	GRADING & DRAINAGE PLAN
C-5A	GRADING & DRAINAGE NETWORK PLAN
C-6	UTILITY PLAN
C-7	LIGHTING PLAN
C-8	LANDSCAPE PLAN
C-9	STORMWATER MANAGEMENT PLAN
C-10 - C18	DETAILS

**REFERENCE PLANS BY ASSOCIATED PROFESSIONALS**

A.101-A.201 ARCHITECTURAL PLANS & ELEVATIONS (BY AHP)

### PERMITS/APPROVALS

	NUMBER	APPROVED	EXPIRES
EXETER PLANNING BOARD SITE PLAN REVIEW APPROVAL	-	-	-
ZONING BOARD OF ADJUSTMENT VARIANCE (ARTICLE 5 SECTION 5.1.2); EXPANSION OF A NON-CONFORMING LIGHT INDUSTRY USE	22-12	9/20/2022	9/20/2025
NHDES AOT PERMIT	-	-	-
NHDES SEWER CONNECTION PERMIT	-	-	-
NHDES WETLAND PERMIT	-	-	-

**OWNER'S SIGNATURE**

THE PROPERTY WILL BE DEVELOPED IN ACCORDANCE WITH THIS PLAN AND THE ORDINANCES OF THE TOWN OF EXETER, NEW HAMPSHIRE, INCLUDING THE INTENT TO DEDICATE FUTURE RIGHT-OF-WAY AND EASEMENTS FOR PUBLIC USE WITH THE PROVISIONS OF THE EXETER SITE PLAN AND SUBDIVISION REGULATIONS.

OWNER OR AUTHORIZED AGENT \_\_\_\_\_ DATE \_\_\_\_\_

**APPROVED BY THE TOWN OF EXETER, NH PLANNING BOARD**

ON \_\_\_\_\_

BOARD MEMBER \_\_\_\_\_ AND \_\_\_\_\_

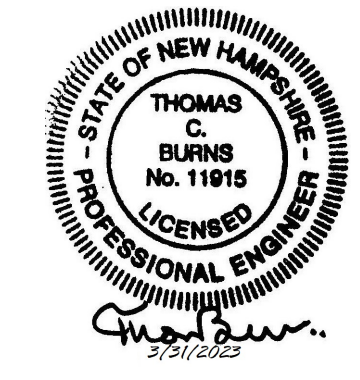
BOARD MEMBER \_\_\_\_\_

### SITE DEVELOPMENT PLANS

TAX MAP 52 LOT 112A  
**COVER**  
**C/A DESIGN, INC.**  
 131 PORTSMOUTH AVE. EXETER NH

OWNED BY  
**NH EXETER PROPERTIES, LLC**  
 PREPARED FOR  
**C/A DESIGN, INC.**

SCALE: NTS FEBRUARY 28, 2023



### LEGEND

EXISTING	PROPOSED	EXISTING	PROPOSED
CBF CONCRETE BOUND	SBTBS	GAS GATE	Light Pole
SBF STONE BOUND	IRTBBS	LIGHT POLE	Building Mounted Light
IPF IRON PIPE	DHS	BUILDING MOUNTED LIGHT	Hydrant
IPinF or IRF IRON PIN		HYDRANT	Sewer Manhole
DHF DRILL HOLE		SEWER MANHOLE	Drain Manhole
GUARD RAIL		DRAIN MANHOLE	Catch Basin
BCC BITUMINOUS CONCRETE CURB		CATCH BASIN	Dandy BAD (SEE DETAIL)
SGC SLOPED GRANITE CURB		DANDY BAD (SEE DETAIL)	Transformer Pad
VGC VERTICAL GRANITE CURB		TRANSFORMER PAD	Water Gate
ICC INTEGRAL CONCRETE CURB		WATER GATE	Utility Pole
EDGE OF PAVEMENT		UTILITY POLE	Well
EDGE OF GRAVEL		WELL	Spot Grade
WOOD FENCE		SPOT GRADE	Index Contour
SILT FENCE		INDEX CONTOUR	Intermediate Contour
SIGN		INTERMEDIATE CONTOUR	Edge of Wetland
TRAFFIC FLOW		EDGE OF WETLAND	Sewer Line
STONEWALL		SEWER LINE	Water Line
ZONING BOUNDARY		WATER LINE	Drain Line
TREELINE		DRAIN LINE	Gas Line
		GAS LINE	Underground Utilities
		UNDERGROUND UTILITIES	

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REV	DATE	DESCRIPTION	JD	TCB
1	3/31/2023	REVISED PER EXETER TRC REVIEW	JD	TCB

**TFM** Civil Engineers, Structural Engineers, Traffic Engineers, Land Surveyors, Landscape Architects, Scientists

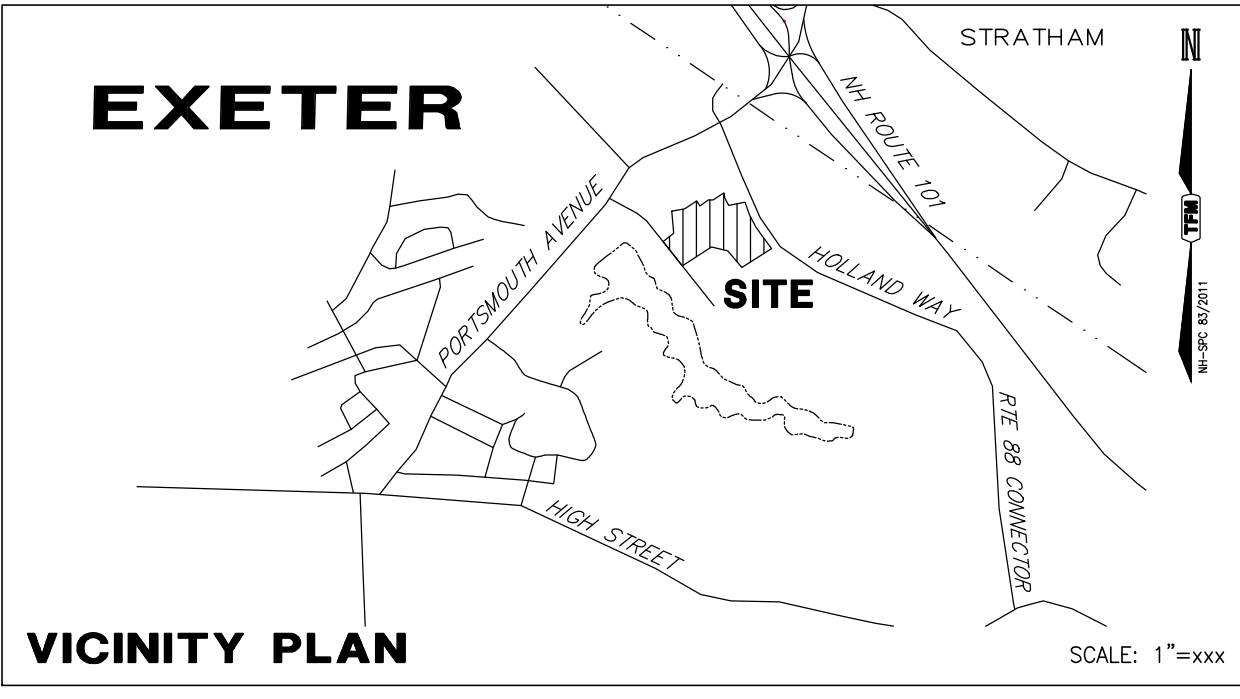
48 Constitution Drive  
 Bedford, NH 03110  
 Phone (603) 472-4488  
 Fax (603) 472-9747  
 www.tfmoran.com

FILE 45659-51 DR JED FB  
 CK TCB CADFILE 45659-51 COVER AND DETAILS C-1

Mar 31, 2023 - 11:48am F:\TFM\Projects\45659-Wakefield Thermal-Exeter\NH\45659-51-Wakefield Thermal-Site Plan\45659-51-C3D\PRODUCTION\45659-51-Cover and Details.dwg

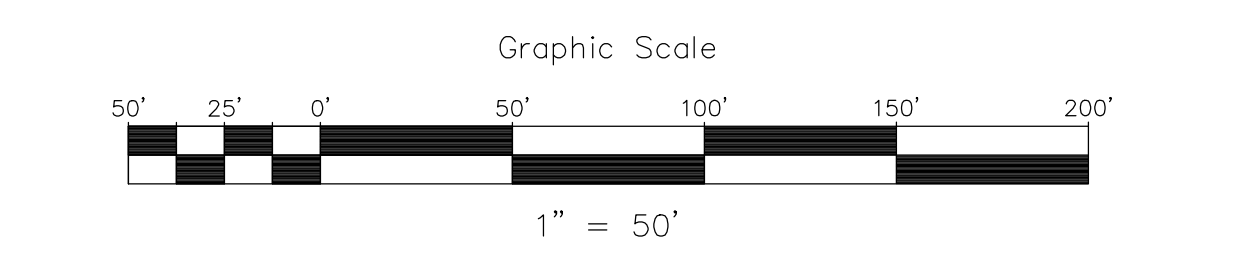
**LEGEND**

- |                         |      |                          |     |
|-------------------------|------|--------------------------|-----|
| VERTICAL GRANITE CURB   | VGC  | WATER GATE               | W   |
| VERTICAL CONCRETE CURB  | VCC  | UTILITY POLE             | U   |
| EDGE OF PAVEMENT        | EOP  | GAS VALVE                | G   |
| SIGN                    | S    | LIGHT POLE               | L   |
| GUY ANCHOR              | GA   | HYDRANT                  | H   |
| SEWER LINE              | S    | ELECTRIC PULLBOX         | EP  |
| SEWER FORCE MAIN        | FM   | CONCRETE SURFACE         | C   |
| WATER LINE              | W    | DECIDUOUS TREE           | D   |
| DRAIN LINE              | D    | CONIFEROUS TREE          | C   |
| GAS LINE                | G    | BOUND                    | B   |
| OVERHEAD UTILITIES      | OHW  | DRILL HOLE               | DR  |
| U.G. ELEC. TEL. & CABLE | UGTC | IRON PIN                 | IP  |
| SEWER MANHOLE           | SMH  | DRAIN MANHOLE            | DMH |
| CATCH BASIN             | CB   | IRRIGATION CONTROL VALVE | ICV |



- NOTES**
- OWNER OF RECORD: MAP 52 LOT 112A  
NH EXETER PROPERTIES, LLC  
70 W. MADISON ST., SUITE 5600  
CHICAGO, IL 60602  
DEED REFERENCE TO PARCEL IS BK 6448 PG. 421  
AREA OF PARCEL = 393,194 S.F. OR 9.026 ACRES.
  - 52-112A INDICATES TAX MAP AND LOT NUMBER.
  - THE PURPOSE OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS PRESENT AS OF THE DATE OF THIS PLAN FOR ASSESSORS MAP 52 LOT 112A, 131 PORTSMOUTH AVENUE, IN EXETER, NEW HAMPSHIRE AS SHOWN HEREON AND NO OTHER PURPOSE.
  - CURRENT ZONING IS C-2 & CT  
C-2  
MINIMUM LOT SIZE: 20,000 S.F.  
MINIMUM LOT FRONTAGE: 150 FT.  
MINIMUM WIDTH: 150 FT. MINIMUM LOT DEPTH: 100 FT.  
MINIMUM BUILDING SETBACKS: FRONT=50 FT., SIDE=20 FT., REAR=50 FT.  
CT  
MINIMUM LOT SIZE: 4 ACRES  
MINIMUM LOT FRONTAGE: 400 FT.  
MINIMUM WIDTH: 400 FT. MINIMUM LOT DEPTH: 400 FT.  
MINIMUM BUILDING SETBACKS: FRONT=75 FT., SIDE=50 FT., REAR=50 FT.
  - EXAMINATION OF THE FLOOD INSURANCE RATE MAP FOR ROCKINGHAM COUNTY, NEW HAMPSHIRE (ALL JURISDICTIONS), MAP NUMBER: 330150406E, EFFECTIVE DATE: 05-17-2005, INDICATES THAT THE SUBJECT PARCEL IS NOT LOCATED WITHIN A FLOOD HAZARD AREA.
  - HORIZONTAL DATUM IS NH-SPC 83.  
VERTICAL DATUM IS NAVD83.  
BENCHMARKS SET: AS NOTED
  - EASEMENTS, RIGHTS, AND RESTRICTIONS SHOWN OR IDENTIFIED ARE THOSE WHICH WERE FOUND DURING RESEARCH PERFORMED AT THE XX COUNTY REGISTRY OF DEEDS. OTHER RIGHTS, EASEMENTS, OR RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF SUBJECT PARCEL(S) MAY DETERMINE.
  - THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. TF MORAN INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UNDERGROUND UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE AT 811.
  - BOUNDARY INFORMATION IS TAKEN FROM REFERENCE PLAN 1.
  - EXISTING CONDITIONS SHOWN ARE BASED ON AN ACTUAL FIELD SURVEY MADE BY THIS OFFICE AND IS AUGMENTED BY DATA OBTAINED FROM DOUCET SURVEY, INC. OF NEWMARKET, NEW HAMPSHIRE.

- REFERENCE PLANS**
- SUBDIVISION PLAN OF LAND FOR 131 PORTSMOUTH AVE, LLC OF TAX MAP 52 LOT 112, DATED OCTOBER 4, 2022, PREPARED BY DOUCET SURVEY LLC. (RCRD PLAN NO. 43579)
  - EASEMENT PLAN OF TAX MAP 52 LOT 112A & TAX MAP 52 LOT 112B FOR 131 PORTSMOUTH AVE LLC, DATED SEPTEMBER 14, 2022, PREPARED BY DOUCET SURVEY LLC. (RCRD PLAN NO. 43581)



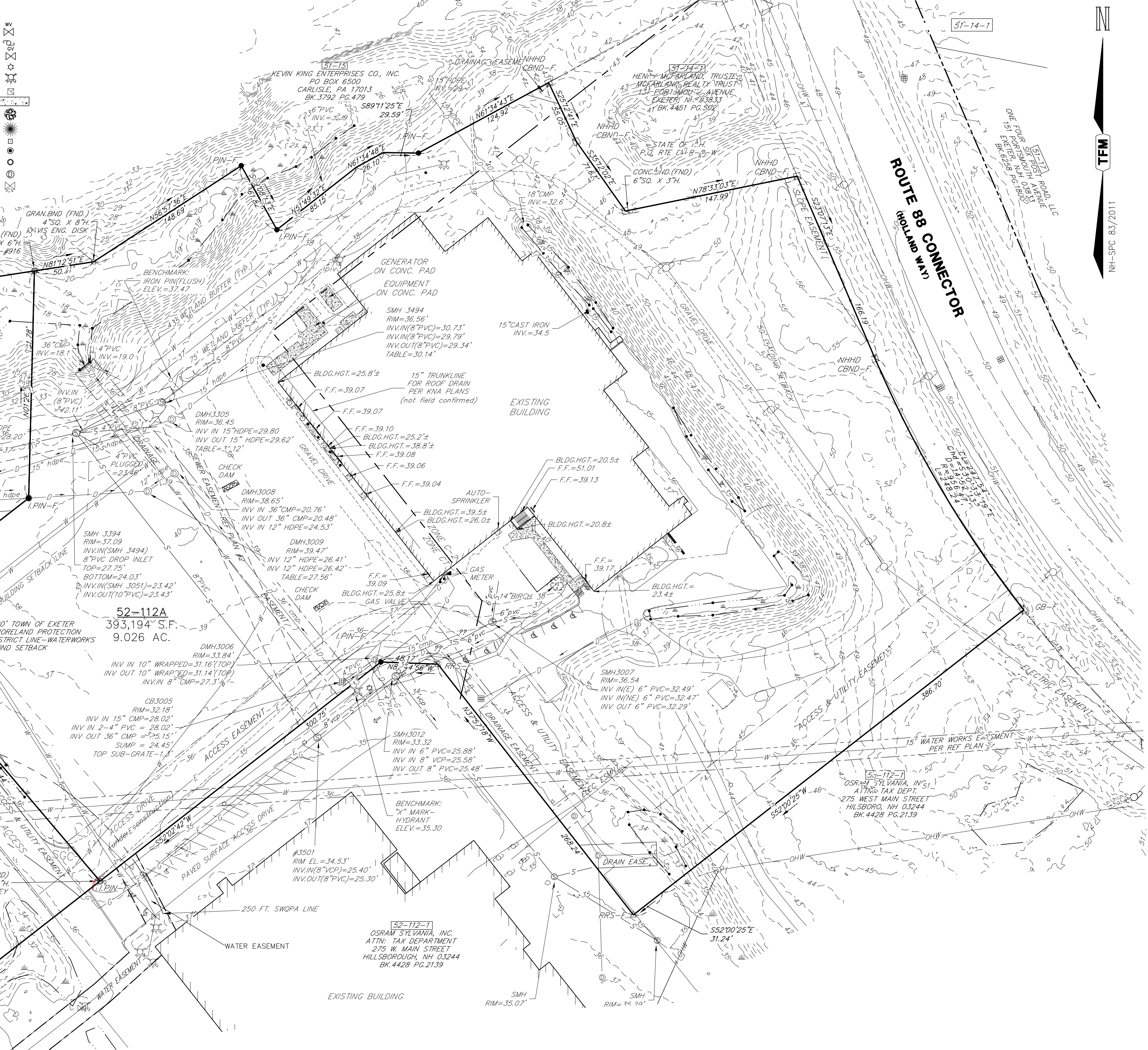
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REV.	DATE	DESCRIPTION	DR	CK



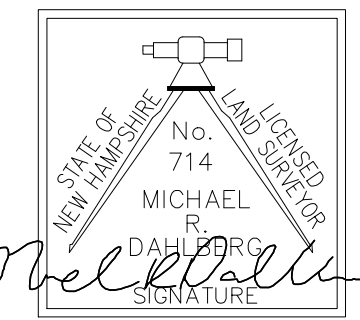
**SURVEYOR'S CERTIFICATION**

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION. FURTHER, THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY MADE BY THIS OFFICE IN DECEMBER OF 2022 AND FEBRUARY OF 2023.

I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN. (RSA 676:18)



*Michael J. Aube*  
MARCH 30, 2023  
DATE



TAX MAP 52 LOT 112-A  
**EXISTING CONDITIONS PLAN**  
**WAKEFIELD THERMAL**  
**GTE DRIVE, EXETER, NEW HAMPSHIRE**  
OWNED BY:  
**OSRAM SYLVANIA, INC.**  
PREPARED FOR:  
**WAKEFIELD THERMAL**  
**SCALE: 1" = 50'** **FEBRUARY 22, 2023**

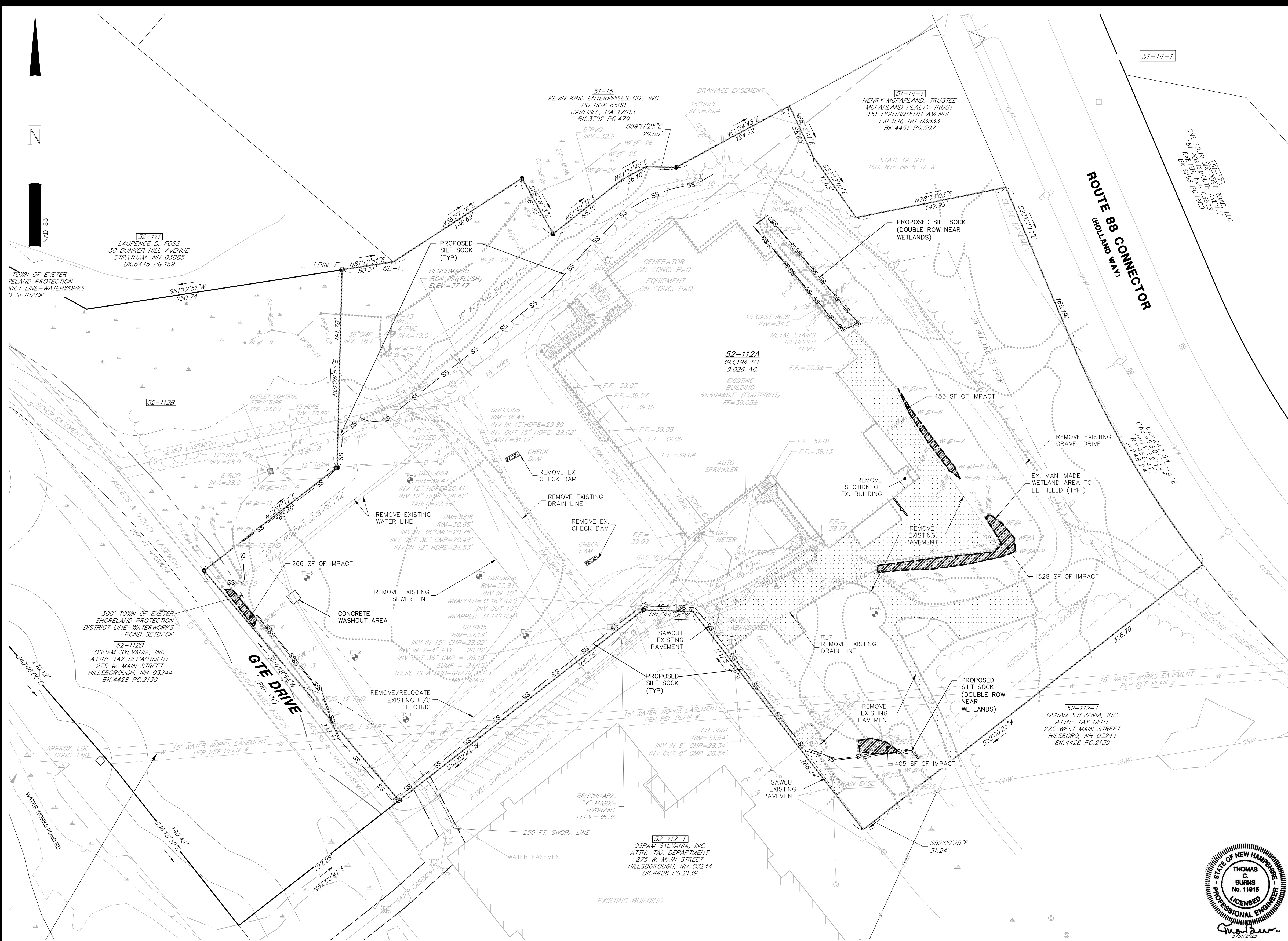
	Civil Engineers	48 Constitution Drive
	Structural Engineers	Bedford, NH 03110
	Traffic Engineers	Phone (603) 472-4488
	Land Surveyors	Fax (603) 472-9747
	Landscape Architects	www.tfmoran.com
	Scientists	

45659.51	DR MRD	FB	-
	CK MRD	CADFILE	45659.51 Survey

C-2

**NOTES**

1. THE CONTRACTOR SHALL MAINTAIN EMERGENCY ACCESS TO ALL AREAS AFFECTED BY HIS WORK AT ALL TIMES.
2. THE CONTRACTOR SHALL VERIFY ALL SURVEY INFORMATION IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE ENGINEER.
3. EXISTING UTILITY SERVICES TO BE RELOCATED OR DISCONTINUED ARE TO BE CAPPED AS REQUIRED BY THEIR RESPECTIVE UTILITY COMPANIES.
4. CONSTRUCTION DEBRIS SHALL BE REMOVED FROM SITE AND DISPOSED OF IN A LEGAL MANNER.

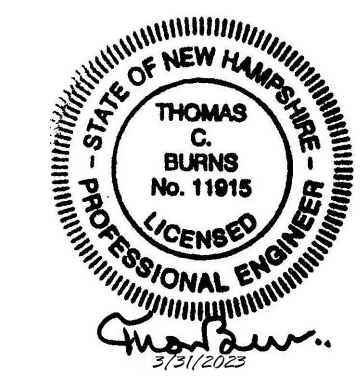


**SITE DEVELOPMENT PLANS**

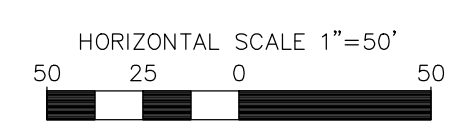
TAX MAP 52 LOT 112A  
**SITE PREPARATION PLAN**  
 C/A DESIGN, INC.  
 131 PORTSMOUTH AVE. EXETER NH  
 OWNED BY  
**NH EXETER PROPERTIES, LLC**  
 PREPARED FOR  
**C/A DESIGN, INC.**

SCALE: 1"=50'

FEBRUARY 28, 2023



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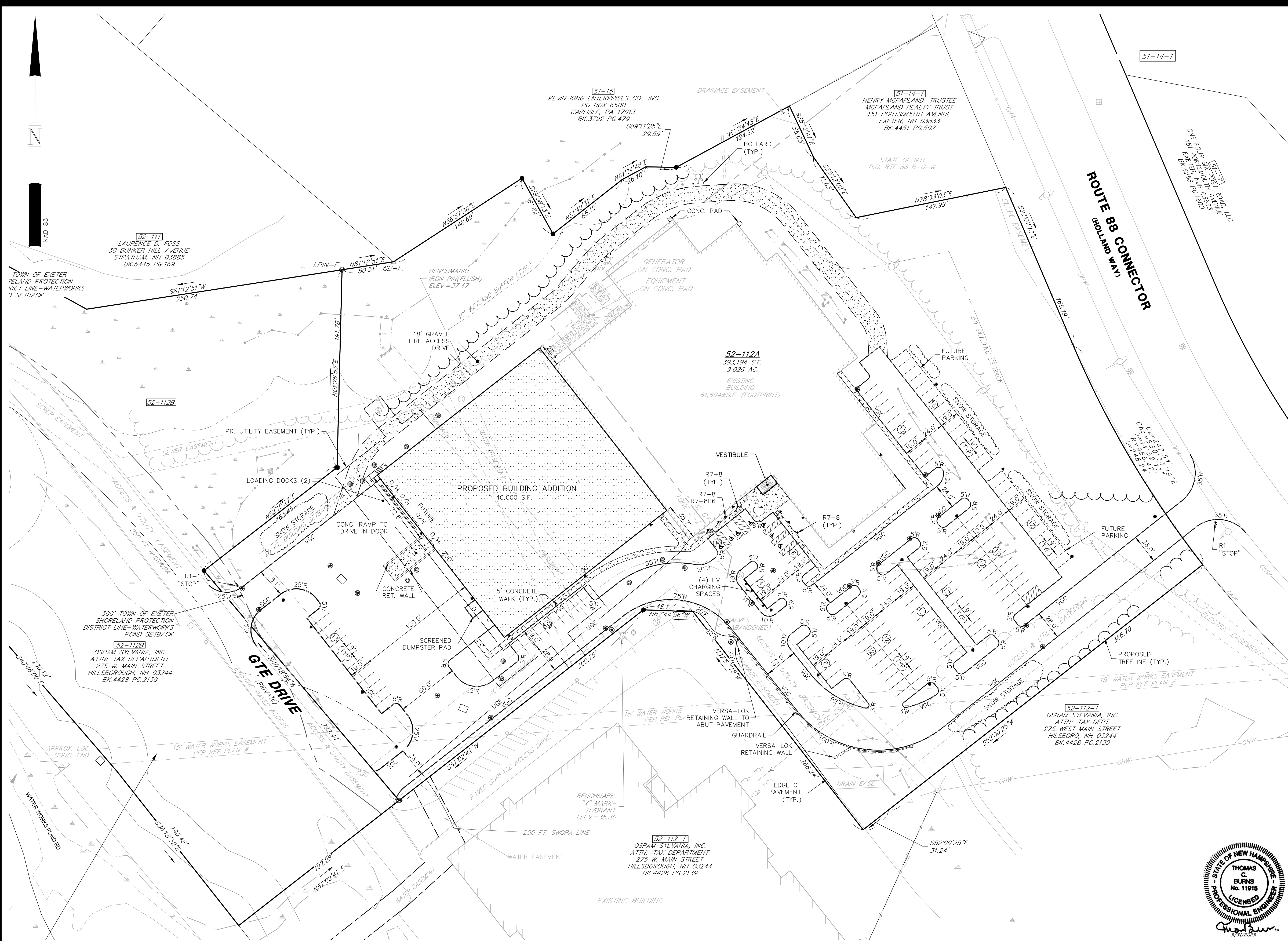


REV	DATE	DESCRIPTION	DR	CK
1	3/31/2023	REVISED PER EXETER TRC REVIEW	JD	TCB

	Civil Engineers Structural Engineers Traffic Engineers Land Surveyors Landscape Architects Scientists	48 Constitution Drive Bedford, NH 03110 Phone (603) 472-4488 Fax (603) 472-9747 www.tfmoran.com
	F I L E 45659-51	DR JED FB CK TCB CADFILE 45659-51 CIVIL SITE PRODUCTION

Mar 31, 2023 - 9:40am  
 W:\TFM-BEDFORD\Projects\Civil-Survey\TFM-Projects\45659-51 Wakefield Thermal - Exeter NH\45659-51 C3\DI\PRODUCTION\45659-51 Civil Site Production.dwg

Mar 31, 2023 - 9:41am W:\TFM-BEDFORD\Projects\Civil-Survey\TFM Projects\45659-51 Wakefield Thermal - Exeter NH\45659-51 Civil Site Production Drawing.dwg



- ### NOTES
- OWNER OF RECORD OF MAP 52 LOT 112A: NH EXETER PROPERTIES, LLC, 70 W. MADISON ST., SUITE 5600, CHICAGO, ILLINOIS 60602. DEED REFERENCE TO PARCEL IS BK 6448 PG 421 AREA OF PARCEL = 9.026± ACRES
  - ZONED: CORPORATE TECHNOLOGY PARK (CT) & HIGHWAY COMMERCIAL (C-2)
  - EXISTING/PROPOSED USE: WAREHOUSE/MANUFACTURING
  - THE PURPOSE OF THIS PLAN IS TO CONSTRUCT A 40,000 SF (1-STORY) ADDITION TO THE EXISTING WAREHOUSE/MANUFACTURING BUILDING, EXPANDED PARKING AND LOADING AREAS AND ASSOCIATED SITE IMPROVEMENTS.
  - TYPICAL HOURS OF OPERATION: MON-SUN, 3-SHIFTS
  - DIMENSIONAL REQUIREMENTS (CURRENT ZONING)
 

	REQUIRED	PROVIDED
LOT SIZE:	C-2 4 AC./20,000 SF	9.026 AC.
LOT FRONTAGE:	400'/150'	413±'
BUILDING SETBACKS:		
FRONT:	75'/50'	197'
SIDE:	50'/20'	39'
REAR:	50'/50'	180'
BUILDING HEIGHT:	50'/35'	>35'
BUILDING COVERAGE:	20%/30%	25.6%
OPEN SPACE:	35%/15%	41%
  - PARKING REQUIREMENTS
    - REQUIRED: MANUFACTURING: 1 SP. EMPLOYEE ON LARGEST SHIFT (150 EMPL.) = 150 SPACES
    - PROPOSED: 153 SPACES, INC. 7 ACCESSIBLE (27 FUTURE)
  - EXAMINATION OF THE FLOOD INSURANCE RATE MAP FOR THE TOWN OF EXETER, NEW HAMPSHIRE, COMMUNITY PANEL NUMBER 330150046E, EFFECTIVE DATE: 5-17-2005, INDICATES THAT THE SUBJECT PARCEL IS NOT LOCATED WITHIN A FLOOD HAZARD AREA.
  - THE CONTRACTOR SHALL BID AND PERFORM THE WORK IN ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES, SPECIFICATIONS, REGULATIONS AND STANDARDS.
  - ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS NOTED OTHERWISE.
  - WRITTEN DIMENSIONS HAVE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REDUCED PLANS. IN CASE OF CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWING AND/OR SPECIFICATION, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY FOR CLARIFICATIONS.
  - THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR CONDITIONS AT THE SITE. THESE PLANS, PREPARED BY TFMORAN, INC., DO NOT EXTEND TO OR INCLUDE SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR THEIR EMPLOYEES, AGENTS, OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF THE SURVEYOR OR ENGINEER HEREON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED INTO THESE PLANS. THE CONSTRUCTION CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS WHICH MAY BE REQUIRED BY THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND/OR LOCAL REGULATIONS.
  - IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE HIMSELF WITH THE SITE AND ALL EXISTING CONDITIONS SURROUNDING IT AND THEREON. THE CONTRACTOR SHALL ADVISE THE APPROPRIATE AUTHORITY OF HIS INTENTIONS AT LEAST 48 HOURS IN ADVANCE.
  - THE CONTRACTOR SHALL MAINTAIN EMERGENCY ACCESS TO ALL AREAS AFFECTED BY HIS WORK AT ALL TIMES.
  - LIGHTING, SIGNAGE, LANDSCAPING, AND SCREENING SHALL MEET THE REQUIREMENTS OF THE EXETER ZONING ORDINANCE AND SITE PLAN REGULATIONS.
  - SITE WORK SHALL BE CONSTRUCTED FROM A COMPLETE SET OF PLANS. NOT ALL FEATURES ARE DETAILED ON EVERY PLAN. THE ENGINEER IS TO BE NOTIFIED OF ANY CONFLICT WITHIN THIS PLAN SET.
  - ALL WORK IS TO CONFORM TO CITY OF MANCHESTER DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS.
  - IN THE EVENT OF A CONFLICT BETWEEN PLANS, SPECIFICATIONS, AND DETAILS, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY FOR CLARIFICATION.
  - IF CONDITIONS AT THE SITE ARE DIFFERENT THAN SHOWN ON THE PLANS, THE ENGINEER SHALL BE NOTIFIED PRIOR TO PROCEEDING WITH THE AFFECTED WORK.
  - THESE PLANS WERE PREPARED UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER. TFMORAN, INC. ASSUMES NO LIABILITY AS A RESULT OF ANY CHANGES OR NON-COMFORMANCE WITH THESE PLANS EXCEPT UPON THE WRITTEN APPROVAL OF THE ENGINEER OF RECORD.
  - TFMORAN, INC. ASSUMES NO LIABILITY FOR WORK PERFORMED WITHOUT AN ACCEPTABLE PROGRAM OF TESTING AND INSPECTION AS APPROVED BY THE ENGINEER OF RECORD.
  - THE LANDOWNER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS, INCLUDING ANY PERMITTING AND SETBACK REQUIREMENTS REQUIRED UNDER THESE REGULATIONS.
  - ALL WATER, SEWER, ROAD (INCLUDING PARKING LOT) AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 9.5 GRADING, DRAINAGE AND EROSION & SEDIMENT CONTROL AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC UTILITIES IN EXETER, NEW HAMPSHIRE.
  - ALL MONUMENTATION SHALL BE SET IN ACCORDANCE WITH SECTION 9.25 OF THE TOWN OF EXETER SITE PLAN REVIEW AND SUBDIVISION REGULATIONS.
  - FIRE GRAVEL ACCESS DRIVE TO BE MAINTAINED FOR YEAR-ROUND EMERGENCY ACCESS.
  - NO SIGNIFICANT TREES (CALIPER GREATER THAN 20") PROPOSED TO BE REMOVED WITHIN LIMITS OF WORK.

## SITE DEVELOPMENT PLANS

TAX MAP 52 LOT 112A

**SITE LAYOUT PLAN**

**C/A DESIGN, INC.**

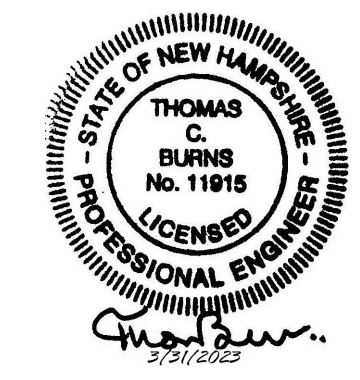
**131 PORTSMOUTH AVE. EXETER NH**

OWNED BY

**NH EXETER PROPERTIES, LLC**

PREPARED FOR

**C/A DESIGN, INC.**



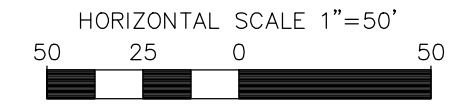
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FEBRUARY 28, 2023

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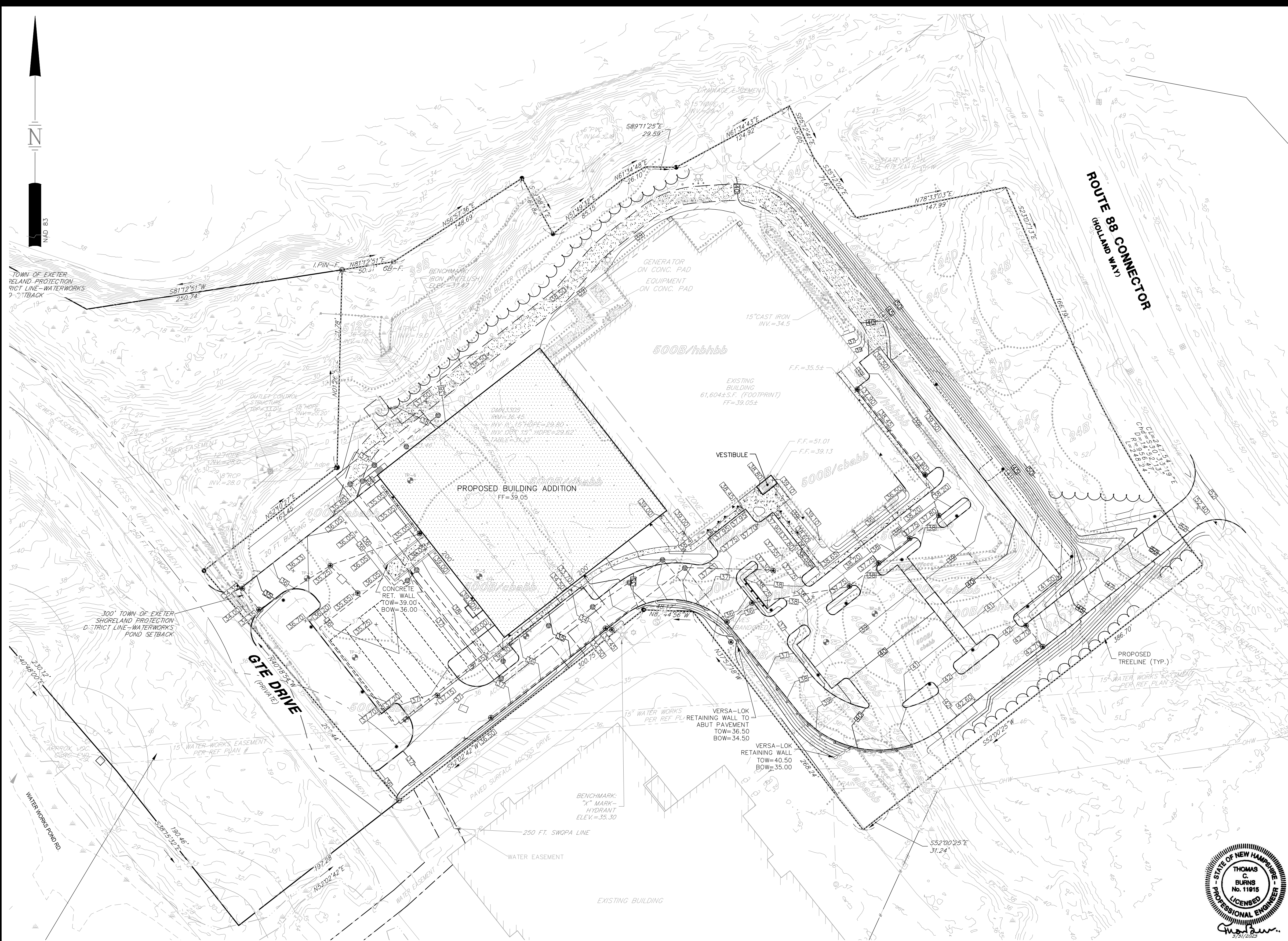
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REV	DATE	DESCRIPTION	DR	CK	T	CB
1	3/31/2023	REVISED PER EXETER TRC REVIEW	JD	TCB		

	Civil Engineers Structural Engineers Traffic Engineers Land Surveyors Landscape Architects Scientists	48 Constitution Drive Bedford, NH 03110 Phone (603) 472-4488 Fax (603) 472-9747 www.tfmoran.com
	F I L E 45659-51	DR JED FB CK TCB CADFILE 45659-51 CIVIL SITE PRODUCTION

Mar 31, 2023 - 11:35am  
TFM-BEDFORD\Projects\Civil-Survey\TFM Projects\45659-51 Wakefield Thermal - Exeter NH\45659-51 Civil Site Production Drawing.dwg

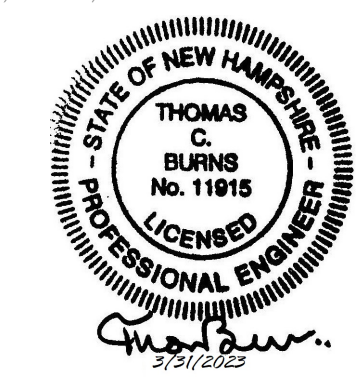


- ### NOTES
- ALL WORK SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE TOWN OF EPPING AND SHALL BE BUILT IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
  - IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE HIMSELF WITH THE SITE AND ALL SURROUNDING CONDITIONS.
  - THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE AND ELEVATION OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS, PRIOR TO THE START OF ANY CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION BE AGREED TO BY THE ENGINEER BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT "DIGSAFE" (811) AT LEAST 72 HOURS BEFORE DIGGING.
  - THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES OWNING UTILITIES, EITHER OVERHEAD OR UNDERGROUND, WITHIN THE CONSTRUCTION AREA AND SHALL COORDINATE AS NECESSARY WITH THE UTILITY COMPANIES OF SAID UTILITIES. THE PROTECTION OR RELOCATION OF UTILITIES IS ULTIMATELY THE RESPONSIBILITY OF THE CONTRACTOR.
  - THE CONTRACTOR SHALL COORDINATE MATERIALS AND INSTALLATION SPECIFICATIONS WITH THE INDIVIDUAL UTILITY AGENCIES/COMPANIES, AND ARRANGE FOR ALL INSPECTIONS.
  - ROAD AND DRAINAGE CONSTRUCTION SHALL CONFORM TO THE TYPICAL SECTIONS AND DETAILS SHOWN ON THE PLANS; AND SHALL MEET LOCAL STANDARDS AND THE REQUIREMENTS OF THE LATEST NHDOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGE CONSTRUCTION AND THE NHDOT STANDARD STRUCTURE DRAWINGS UNLESS OTHERWISE NOTED.
  - STORM DRAINAGE SYSTEM SHALL BE CONSTRUCTED TO LINE AND GRADE AS SHOWN ON THE PLANS. CONSTRUCTION METHODS SHALL CONFORM TO NHDOT STANDARD SPECIFICATIONS, SECTION 603. CATCH BASINS AND DRAIN MANHOLES SHALL CONFORM TO SECTION 604. ALL CATCH BASIN GRATES SHALL BE TYPE B AND CONFORM TO NHDOT STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED.
  - ALL MANHOLES IN PAVEMENT SHALL HAVE RIMS SET TO FINISH GRADE REGARDLESS OF ANY ELEVATIONS OTHERWISE SHOWN.
  - ALL ELEVATIONS SHOWN AT CURB ARE TO THE BOTTOM OF CURB UNLESS OTHERWISE NOTED. CURBS HAVE A 6" REVEAL UNLESS OTHERWISE NOTED.
  - ALL EXCAVATIONS SHALL BE THOROUGHLY SECURED ON A DAILY BASIS BY THE CONTRACTOR AT THE COMPLETION OF CONSTRUCTION OPERATIONS IN THE IMMEDIATE AREA.
  - IN ACCORDANCE WITH RSA 430:53 AND Agr 3800, THE CONTRACTOR SHALL NOT TRANSPORT INVASIVE SPECIES OFF THE PROPERTY, AND SHALL DISPOSE OF INVASIVE SPECIES ON-SITE IN A LEGAL MANNER.
  - THE SITE CONTRACTOR SHALL MAINTAIN, AND EXECUTE A S.W.P.P.P. (PREPARED BY OTHERS) IN ACCORDANCE WITH EPA REGULATIONS AND THE CONSTRUCTION GENERAL PERMIT.
  - THE SITE CONTRACTOR SHALL COORDINATE WITH THE OWNER TO SUBMIT AN eNOI AT LEAST 14 DAYS IN ADVANCE OF ANY EARTHWORK ACTIVITIES AT THE SITE.
  - THE EROSION CONTROL PRACTICES SHOWN ON THESE PLANS ARE ILLUSTRATIVE ONLY AND SHALL BE SUPPLEMENTED BY THE SITE CONTRACTOR AS NEEDED.
  - COORDINATE WITH ARCHITECTURAL PLANS FOR DETAILED GRADING AT BUILDING, AND SIZE AND LOCATION OF ALL BUILDING SERVICES.
  - LIMITS OF WORK ARE SHOWN AS APPROXIMATE. THE CONTRACTOR SHALL COORDINATE ALL WORK TO PROVIDE SMOOTH TRANSITIONS. THIS INCLUDES GRADING, PAVEMENT, CURBING, SIDEWALKS AND ALIGNMENTS.
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## SITE DEVELOPMENT PLANS

TAX MAP 52 LOT 112A  
**GRADING & DRAINAGE PLAN**  
**C/A DESIGN, INC.**  
**131 PORTSMOUTH AVE. EXETER NH**  
 OWNED BY  
**NH EXETER PROPERTIES, LLC**  
 PREPARED FOR  
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SCALE: 1"=50' FEBRUARY 28, 2023



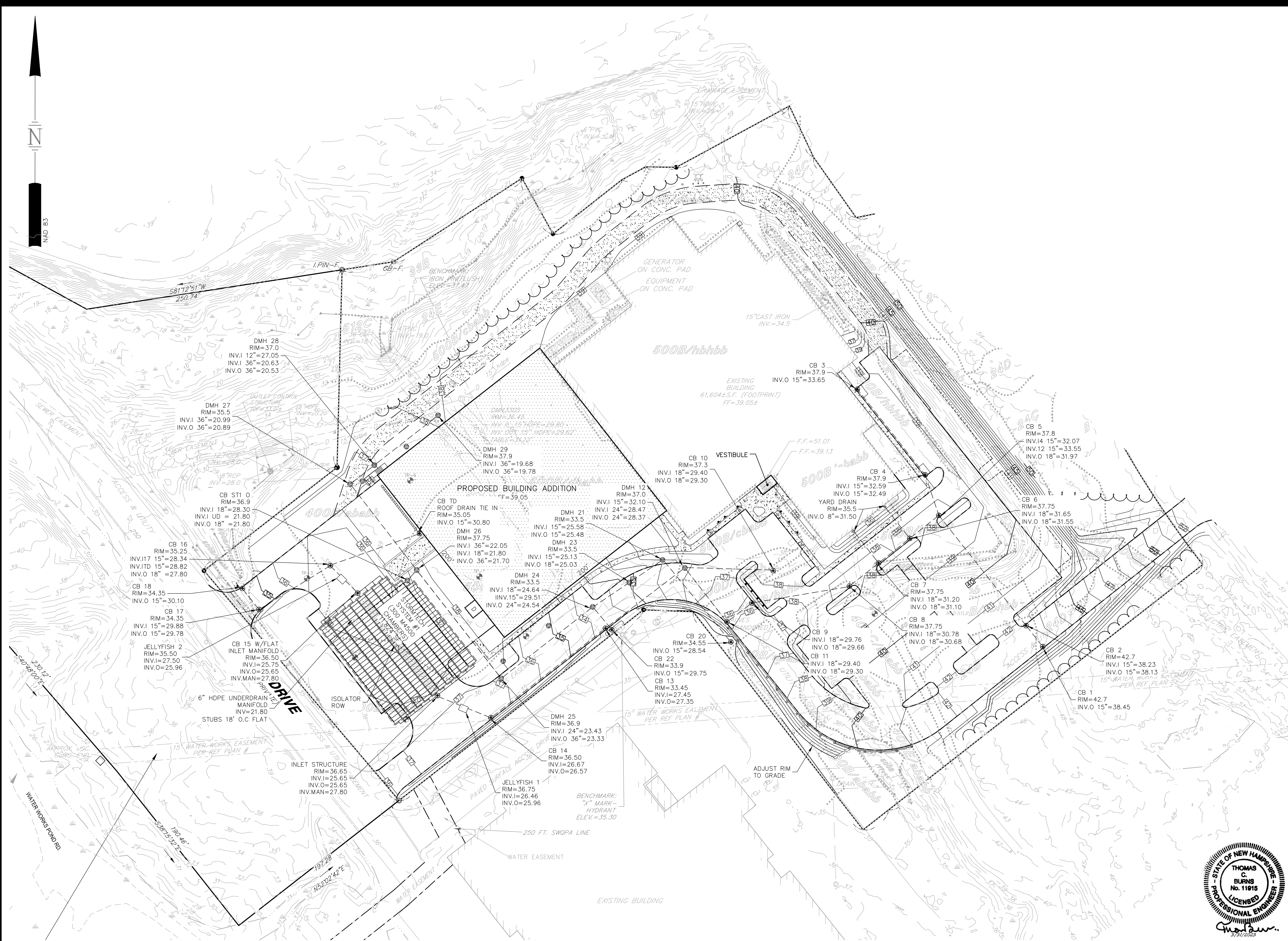
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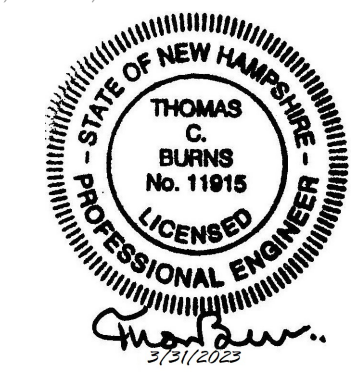


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## SITE DEVELOPMENT PLANS

TAX MAP 52 LOT 112A  
**GRADING AND DRAINAGE NETWORK PLAN**  
**C/A DESIGN, INC.**  
**131 PORTSMOUTH AVE. EXETER NH**  
 OWNED BY  
**NH EXETER PROPERTIES, LLC**  
 PREPARED FOR  
**C/A DESIGN, INC.**

SCALE: 1"=50' FEBRUARY 28, 2023



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HORIZONTAL SCALE 1"=50'  
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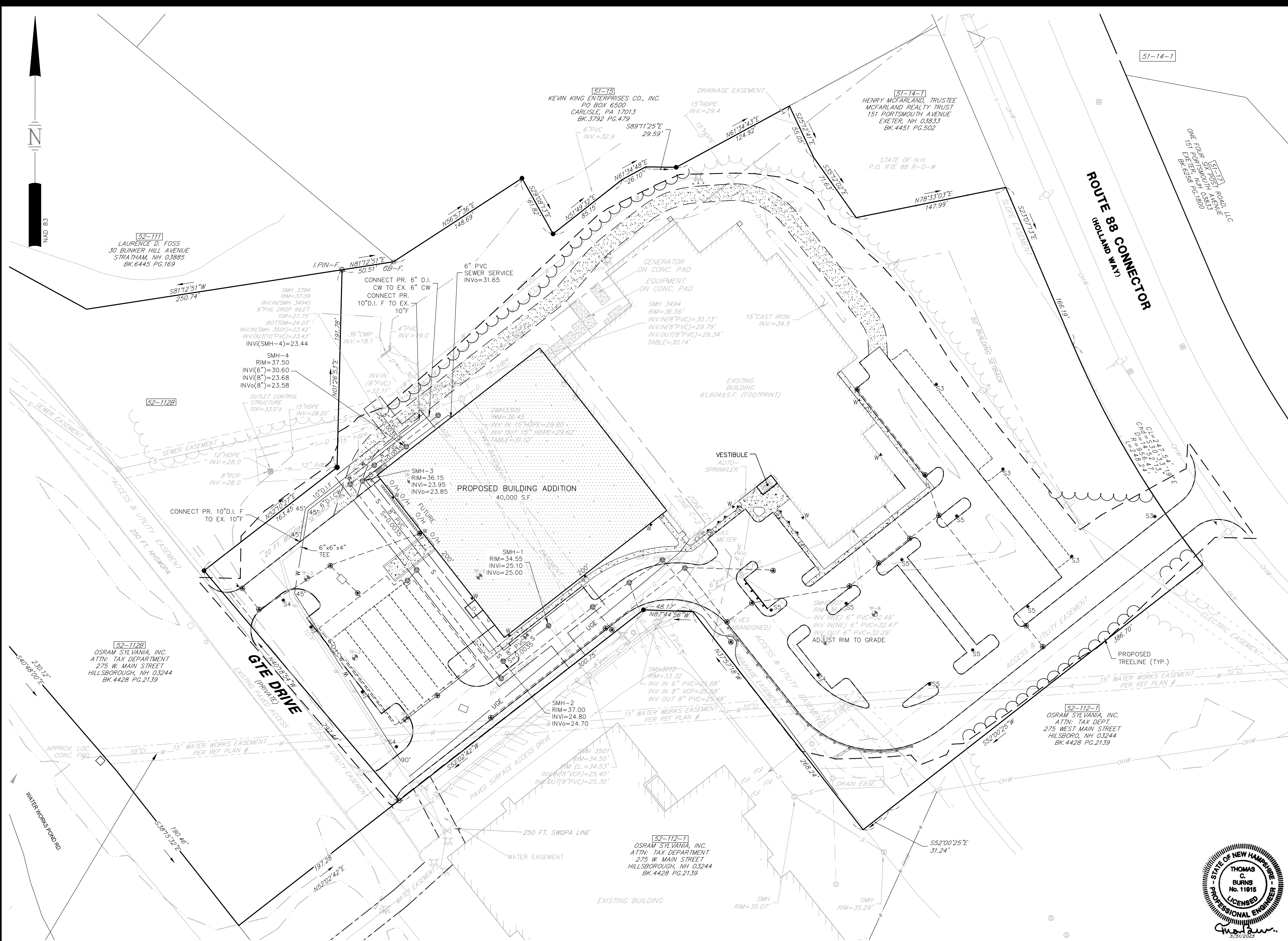
FILE	45659-51	DR	JED	FB			
REV		CK	TCB	CADFILE	45659-51 CIVIL SITE PRODUCTION		C5A



Civil Engineers  
 Structural Engineers  
 Traffic Engineers  
 Land Surveyors  
 Landscape Architects  
 Scientists

48 Constitution Drive  
 Bedford, NH 03110  
 Phone (603) 472-4488  
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- ### NOTES
- LENGTH OF PIPE IS FOR CONVENIENCE ONLY. ACTUAL PIPE LENGTH SHALL BE DETERMINED IN THE FIELD.
  - ALL PROPOSED UTILITY WORK, INCLUDING MATERIAL, INSTALLATION, TERMINATION, EXCAVATION, BEDDING, BACKFILL, COMPACTION, TESTING, CONNECTIONS, AND CONSTRUCTION SHALL BE COORDINATED WITH AND COMPLETED IN ACCORDANCE WITH THE APPROPRIATE REQUIREMENTS, CODES, AND STANDARDS OF ALL CORRESPONDING UTILITY ENTITIES AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
  - THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE, AND ELEVATION OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS, PRIOR TO THE START OF ANY CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION BE AGREED TO BY THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
  - COORDINATE ALL WORK ADJACENT TO PROPOSED BUILDINGS WITH ARCHITECTURAL BUILDING DRAWINGS. CONFIRM UTILITY PENETRATIONS AND INVERT ELEVATIONS ARE COORDINATED PRIOR TO INSTALLATION.
  - THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES OWNING UTILITIES, EITHER OVERHEAD OR UNDERGROUND, WITHIN THE CONSTRUCTION AREA AND SHALL COORDINATE AS NECESSARY WITH THE UTILITY COMPANIES OF SAID UTILITIES. THE PROTECTION OR RELOCATION OF UTILITIES IS ULTIMATELY THE RESPONSIBILITY OF THE CONTRACTOR.
  - THE EXACT LOCATION OF NEW UTILITY CONNECTIONS SHALL BE DETERMINED BY THE CONTRACTOR IN COORDINATION WITH UTILITY COMPANY, COUNTY AGENCY, AND/OR PRIVATE UTILITY COMPANY.
  - THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO REMEDY THE UTILITY INSTALLATION COMPLETE AND OPERATIONAL.
  - ALL UTILITY COMPANIES REQUIRE INDIVIDUAL CONDUITS. CONTRACTOR TO COORDINATE WITH TELEPHONE, CABLE, AND ELECTRIC COMPANIES REGARDING NUMBER, SIZE, AND TYPE OF CONDUITS REQUIRED PRIOR TO INSTALLATION OF ANY CONDUIT.
  - SANITARY SEWER SHALL BE CONSTRUCTED TO THE STANDARDS AND SPECIFICATIONS AS SHOWN ON THESE PLANS. ALL SEWER MAINS AND FITTINGS SHALL BE PVC AND SHALL CONFORM TO ASTM F 679 (SDR 35 MINIMUM). FORCE MAINS AND FITTINGS SHALL CONFORM TO NH CODE OF ADMINISTRATIVE RULES ENV-WQ 700. ALL SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH NH CODE OF ADMINISTRATIVE RULES ENV-WQ 700. SANITARY MANHOLES SHALL CONFORM TO NHDES WATER DIVISION WASTEWATER ENGINEERING BUREAU STANDARDS AND SPECIFICATIONS SHOWN HEREON.
  - ON-SITE WATER DISTRIBUTION SHALL BE TO TOWN OF EXETER STANDARDS AND SPECIFICATIONS. WATER MAINS SHALL HAVE A MINIMUM OF 5.5' COVER. WHERE WATER PIPES CROSS SEWER LINES A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN THE TWO OUTSIDE PIPE WALLS SHALL BE OBSERVED. HORIZONTAL SEPARATION BETWEEN WATER AND SEWER SHALL BE 10' MINIMUM. WHERE A SANITARY LINE CROSSES A WATER LINE, SEWER LINE MUST BE CONSTRUCTED OF FORCE MAIN MATERIALS (PER ENV-WQ 704.08) FROM BUILDING OR MANHOLE TO MANHOLE, OR SUBSTITUTE RUBBER-GASKETED PRESSURE PIPE FOR THE SAME DISTANCE. WHEN SANITARY LINES PASS BELOW WATER LINES, LAY PIPE SO THAT NO JOINT IN THE SANITARY LINE WILL BE CLOSER THAN 6' HORIZONTALLY TO THE WATER LINE.
  - THRUST BLOCKS SHALL BE PROVIDED AT ALL LOCATIONS WHERE WATER LINE CHANGES DIRECTIONS OR CONNECTS TO ANOTHER WATER LINE.
  - THE GENERAL CONTRACTOR IS RESPONSIBLE FOR CONDUIT AND WIRING TO ALL SIGNS AND LIGHTS. CONDUIT TO BE A MINIMUM OF 24" BELOW FINISH GRADE.
  - ALL PROPOSED UTILITIES SHALL BE UNDERGROUND. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON FULL ROPES.
  - THE CONTRACTOR SHALL ARRANGE AND PAY FOR ALL INSPECTIONS, TESTING, AND RELATED SERVICES AND SUBMIT COPIES OF ACCEPTANCE TO THE OWNER, UNLESS OTHERWISE INDICATED.
  - PROVIDE PERMANENT PAVEMENT REPAIR FOR ALL UTILITY TRENCHES IN EXISTING ROAD OR PAVEMENT TO REMAIN. SAW CUT TRENCH, PAVEMENT, AND GRANULAR BASE THICKNESS TO MATCH EXISTING PAVEMENT. OBTAIN ALL PERMITS REQUIRED FOR TRENCHING.
  - UNLESS OTHERWISE SPECIFIED, ALL UNDERGROUND STRUCTURES, PIPES, CHAMBERS, ETC. SHALL BE COVERED WITH A MINIMUM OF 18" OF COMPACTED SOIL BEFORE EXPOSURE TO VEHICLE LOADS.
  - THE PROPERTY WILL BE SERVICED BY THE FOLLOWING:  
DRAINAGE PRIVATE  
SEWER MUNICIPAL  
WATER MUNICIPAL
  - SITE CONTRACTOR MUST OBTAIN AN EXETER UTILITY PIPE INSTALLER'S LICENSE AND THE JOB SUPERVISOR OR FOREMAN MUST BE CERTIFIED BY THE TOWN PRIOR TO WORKING ON ANY TOWN-OWNED WATER, SEWER OR DRAINAGE PIPES OR UTILITIES THAT WILL CONNECT TO TOWN-OWNED UTILITIES. A LICENSED SUPERVISOR OR FOREMAN MUST BE PRESENT AT THE JOB SITE AT ALL TIMES DURING CONSTRUCTION OF THESE UTILITIES.

## SITE DEVELOPMENT PLANS

TAX MAP 52 LOT 112A

UTILITY PLAN

C/A DESIGN, INC.

131 PORTSMOUTH AVE. EXETER NH

OWNED BY

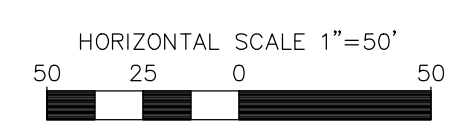
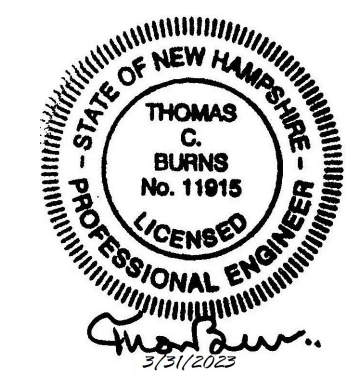
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SCALE: 1"=50'

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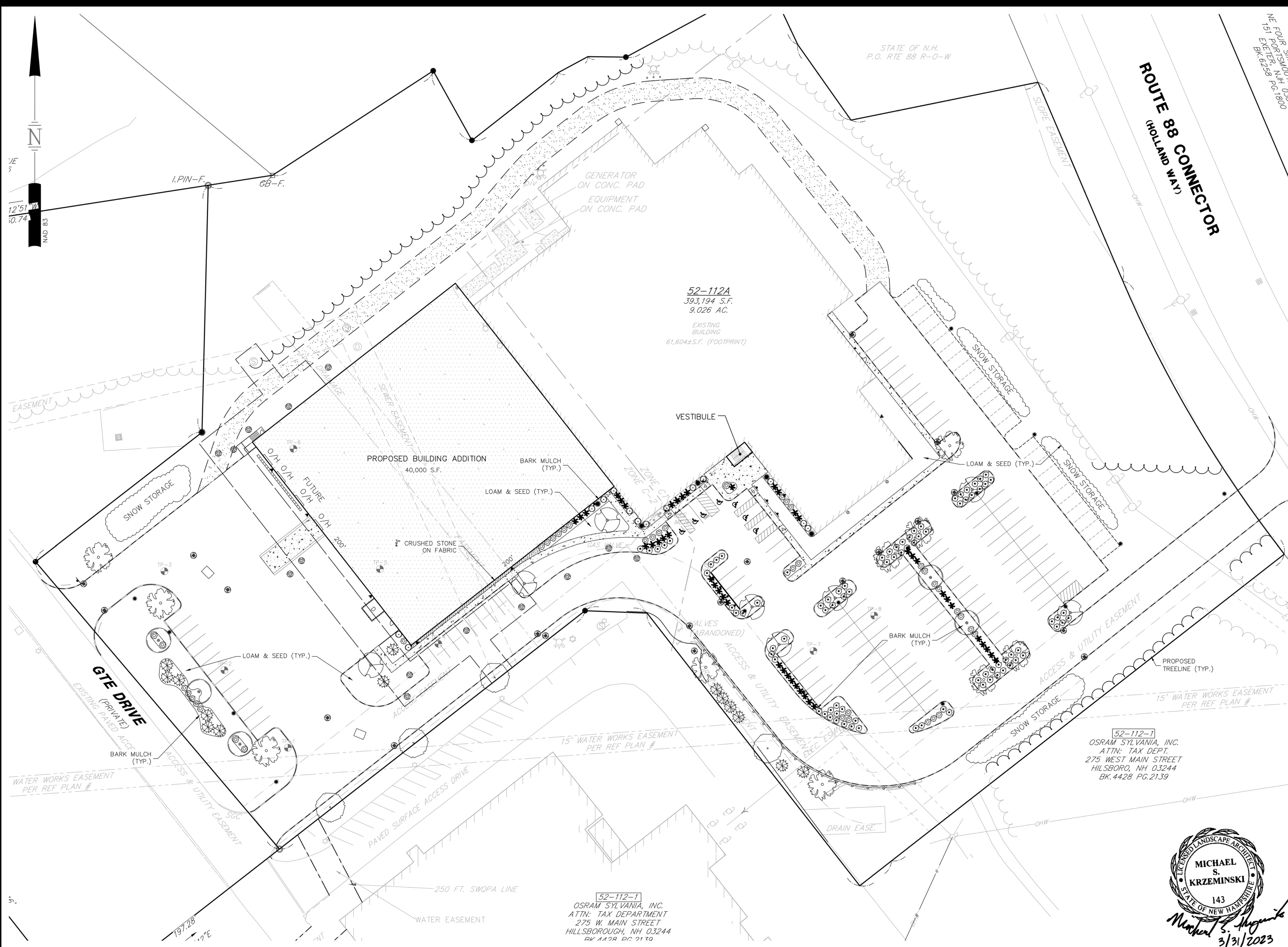
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Civil Engineers  
Structural Engineers  
Traffic Engineers  
Land Surveyors  
Landscape Architects  
Scientists

48 Constitution Drive  
Bedford, NH 03110  
Phone (603) 472-4488  
Fax (603) 472-9747  
www.tfmoran.com

Mar 31, 2023 - 11:20am \\TFM-BEDFORD\Projects\Civil-Survey\TFM-Projects\45659-51 Wakefield Thermal - Exeter NH\45659-51 Wakefield Thermal - Site Plan\45659-51 C3D\PRODUCTION\45659-51 Civil Site Production Drawing.dwg



**LANDSCAPE LEGEND**

SYMBOL	QTY	BOTANICAL NAME COMMON NAME	SIZE	REMARKS
	10	ACER RUBRUM 'OCTOBER GLORY' OCTOBER GLORY RED MAPLE	2 1/2" TO 3" CAL.	B&B
	8	PLATANUS X ACREIFOLIA 'BLOODGOOD' BLOODGOOD LONDON PLANETREE	2 1/2" TO 3" CAL.	B&B
	4	QUERCUS RUBRA RED OAK	2 1/2" TO 3" CAL.	B&B
	5	TILIA C. 'GREENSPIRE' GREENSPIRE LITTLELEAF LINDEN	2 1/2" TO 3" CAL.	B&B
	14	THUJA P. 'GREEN GIANT' GREEN GIANT ARBORVITAE	6' TO 7'	B&B
	40	JUNIPERUS C. 'PFITZERIANA COMPACTA' COMPACT PFITZER JUNIPER	3 GAL.	CONT.
	88	JUNIPERUS H. 'BAR HARBOR' BAR HARBOR JUNIPER	3 GAL.	CONT.
	45	PANICUM V. 'CHEYENNE SKY' CHEYENNE SKY SWITCH GRASS	3 GAL.	CONT.
	14	TAXUS M. 'GREENWAVE' GREENWAVE YEW	18" TO 24"	B&B
	5	THUJA O. 'SMARAGD' EMERALD GREEN ARBORVITAE	4' TO 5'	B&B

**LANDSCAPE NOTES**  
(SEE DETAILS FOR ADDITIONAL NOTES)

- GENERAL**
- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE RULES, REGULATIONS, LAWS, AND ORDINANCES HAVING JURISDICTION OVER THIS PROJECT SITE.
  - PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND NOTIFY OWNER'S REPRESENTATIVE OF CONFLICTS.
  - THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES SHOWN ON PLANS BEFORE PRICING THE WORK. ANY DIFFERENCE IN QUANTITIES SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT FOR CLARIFICATION. LANDSCAPE QUANTITIES SHOWN ON THE PLAN SHALL SUPERCEDE QUANTITIES LISTED IN LANDSCAPE LEGEND.
  - THE CONTRACTOR SHALL CONTACT THE LANDSCAPE ARCHITECT PRIOR TO STARTING WORK AND VERIFY THAT THE PLANS IN THE CONTRACTOR'S POSSESSION ARE THE MOST CURRENT PLANS AVAILABLE AND ARE THE APPROVED PLAN SET FOR USE IN CONSTRUCTION.
  - INsofar AS POSSIBLE, THE DEVELOPMENT PLAN SHALL PRESERVE EXISTING WOODLANDS AND SUITABLE INDIVIDUAL TREES. IF NOT POSSIBLE TO RETAIN SUCH, ADDITIONAL SUITABLE PLANTINGS SHALL BE INCLUDED ON THE DEVELOPMENT PLAN. IN ACCORDANCE WITH THE NH DEPARTMENT OF AGRICULTURE, MARKETS AND FOOD REGULATION AGR-3800, PLANTINGS MAY NOT CONTAIN ANY PROHIBITED SPECIES, INCLUDING THEIR CULTIVARS AND VARIETIES. FOR REDEVELOPMENT, SALVAGE OF EXISTING LANDSCAPING AND REPLANTING PROHIBITED SPECIES ARE ALSO PROHIBITED. IN ADDITION, THE BOARD MAY REQUIRE BUFFER STRIPS BETWEEN DEVELOPMENTS AND ADJACENT LAND USES AS DEEMED NECESSARY.
  - ALL PLANTS SHALL BE FIRST CLASS AND SHALL BE REPRESENTATIVE OF THEIR NORMAL SPECIES AND/OR VARIETIES. ALL PLANTS MUST HAVE GOOD, HEALTHY, WELL-FORMED UPPER GROWTH AND A LARGE, FIBEROUS, COMPACT ROOT SYSTEM.
  - ALL PLANTS SHALL BE FREE FROM DISEASE AND INSECT PESTS AND SHALL COMPLY WITH ALL APPLICABLE STATE AND FEDERAL LAWS PERTAINING TO PLANT DISEASES AND INFESTATIONS.
  - ALL TREES SHALL BE BALLED AND BURLAPPED (B & B) UNLESS OTHERWISE NOTED OR APPROVED BY LANDSCAPE ARCHITECT.
  - IF APPLICABLE, THE CONTRACTOR SHALL HAVE ALL FALL TRANSPLANTING HAZARD PLANTS DUG IN THE SPRING AND STORED FOR FALL PLANTING.
  - ALL INVASIVE PLANT SPECIES FROM THE "NEW HAMPSHIRE PROHIBITED INVASIVE PLANT SPECIES LIST", TO BE REMOVED SHALL BE DONE SO IN ACCORDANCE WITH THE "INVASIVE SPECIES ACT, HB 1258-FN."

**GUARANTEE**  
THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL LANDSCAPE WORK FOR A PERIOD OF ONE YEAR, BEGINNING AT THE START OF THE MAINTENANCE PERIOD.

52-112-1  
OSRAM SYLVANIA, INC.  
ATTN: TAX DEPT.  
275 WEST MAIN STREET  
HILLSBORO, NH 03244  
BK. 4428 PG. 2139

52-112-1  
OSRAM SYLVANIA, INC.  
ATTN: TAX DEPARTMENT  
275 W. MAIN STREET  
HILLSBOROUGH, NH 03244  
BK 4428 PG 2130

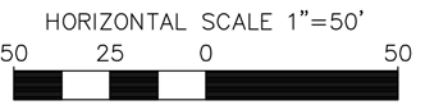


**SITE DEVELOPMENT PLANS**

TAX MAP 52 LOT 112A  
**LANDSCAPE PLAN**  
C/A DESIGN, INC.  
131 PORTSMOUTH AVE. EXETER NH  
OWNED BY  
**NH EXETER PROPERTIES, LLC**  
PREPARED FOR  
**C/A DESIGN, INC.**

SCALE: 1"=50' FEBRUARY 28, 2023

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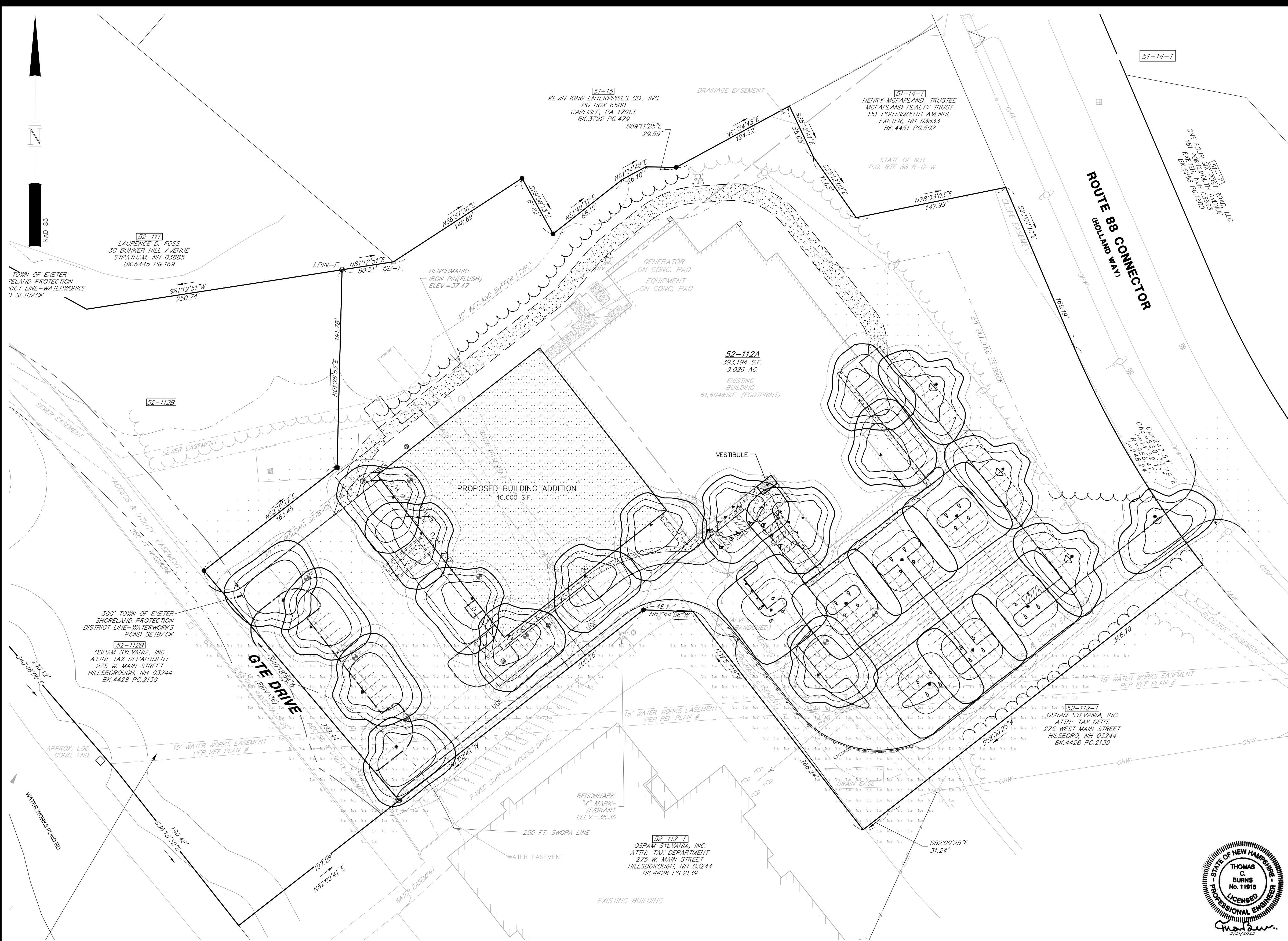


REV	DATE	DESCRIPTION	DR	CHK	TCB
1	3/31/2023	REVISED PER EXETER TRC REVIEW	JD	TCB	

	Civil Engineers Structural Engineers Traffic Engineers Land Surveyors Landscape Architects Scientists	48 Constitution Drive Bedford, NH 03110 Phone (603) 472-4488 Fax (603) 472-9747 www.tfmoran.com
	File # 45659-51 DR JED FB CK TCB CADFILE 45659-51 CIVIL SITE PRODUCTION	C-7



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**NOTES**

- LIGHTING DESIGN PREPARED BY EXPOSURE LIGHTING, 6 SCOTT ROAD HAMPTON, NH 03842 TEL: (603) 601-8080 / EXPOSURELIGHTING.COM & ESS-LLC.US
- PROPOSED LIGHT FIXTURES BY LSI INDUSTRIES, INC.

LUMINAIRE SCHEDULE				
SYMBOL	QTY	LABEL	ARRANGEMENT	DESCRIPTION
	4	S3	SINGLE	MRS-LED-09L-SIL-3-UNV-DIM-30-70CRI-CXX / 45Q-B3-S11G-20-5-GA-BC (20' AFG)
	5	S4	SINGLE	MRS-LED-12L-SIL-FT-UNV-DIM-30-70CRI-CXX / 45Q-B3-S11G-20-5-GA-BC (20' AFG)
	7	S5	SINGLE	MRS-LED-09L-SIL-5W-UNV-DIM-30-70CRI-CXX / 45Q-B3-S11G-20-5-GA-BC (20' AFG)
	10	W	SINGLE	XWM-FT-LED-12L-30-UE-XXX/WALL MTD (18' AFG)



**MIRANDA SMALL AREA (MRS)**  
OUTDOOR LED AREA LIGHT

N.T.S.



**MIRANDA MEDIUM WALL SCONCE (XWM)**  
OUTDOOR WALL SCONCE

N.T.S.



**LSI LIGHT POLE**  
STEEL SQUARE POLE

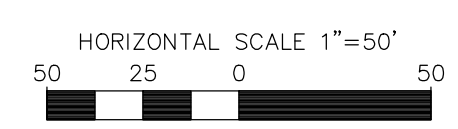
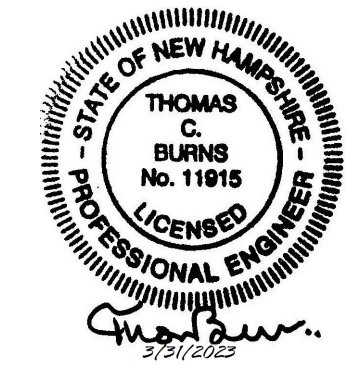
N.T.S.

**SITE DEVELOPMENT PLANS**

TAX MAP 52 LOT 112A  
**LIGHTING PLAN**  
**C/A DESIGN, INC.**  
**131 PORTSMOUTH AVE. EXETER NH**  
 OWNED BY  
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 PREPARED FOR  
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SCALE: 1"=50'

FEBRUARY 28, 2023



REV	DATE	DESCRIPTION	DR	CK	JED	TCB
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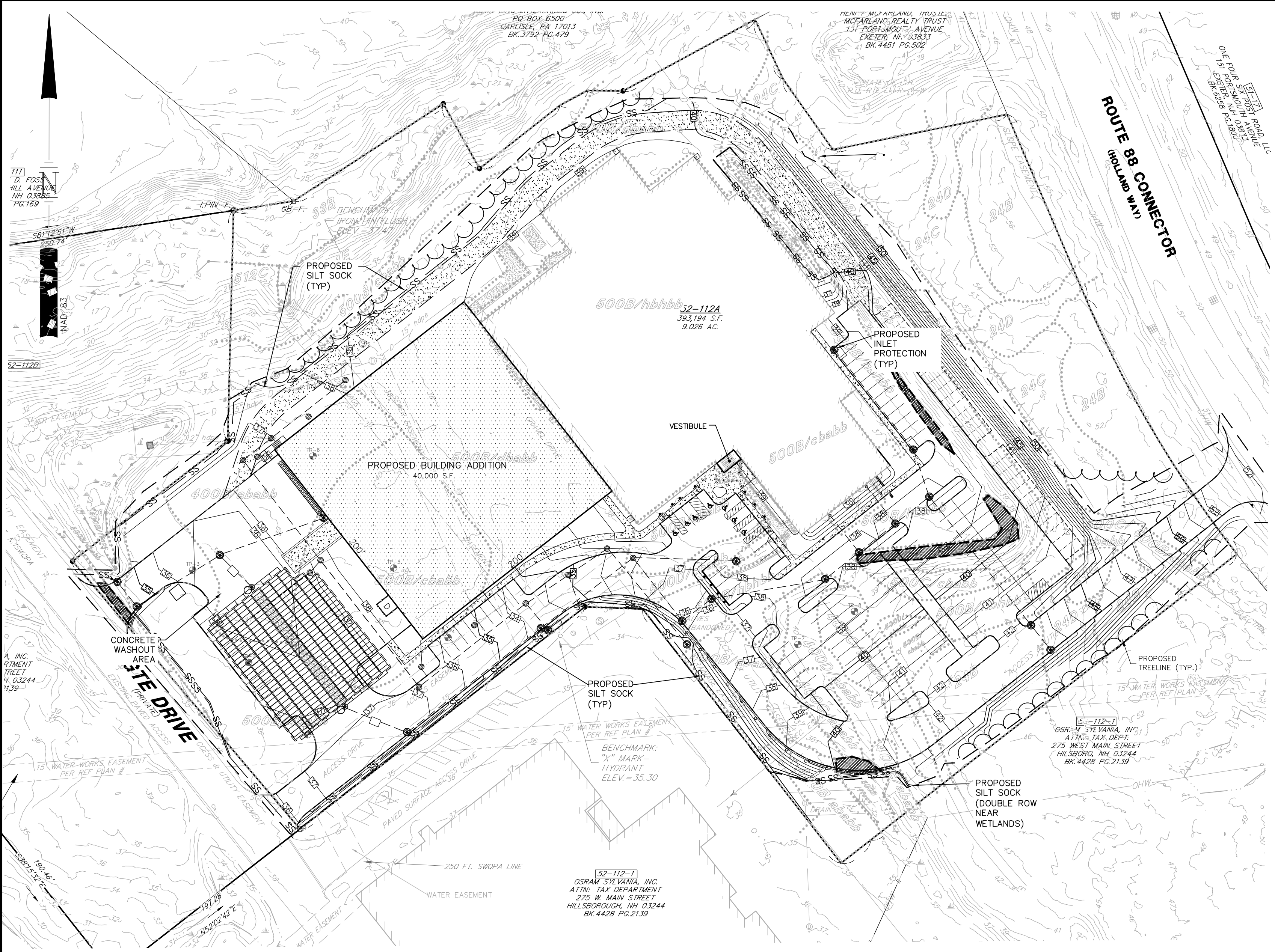
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### CONSTRUCTION GENERAL PERMIT

- THE OWNER, IN CONJUNCTION WITH THE CONTRACTOR (OPERATORS), MUST OBTAIN A CONSTRUCTION GENERAL PERMIT (CGP) FOR LARGE CONSTRUCTION ACTIVITIES (FIVE OR MORE ACRES) OR SMALL CONSTRUCTION ACTIVITIES (GREATER THAN ONE ACRE BUT LESS THAN FIVE ACRES) FROM THE ENVIRONMENTAL PROTECTION AGENCY (EPA). AS PART OF THE CGP, A STORMWATER NOTICE OF INTENT (NOI) MUST BE SUBMITTED TO THE EPA AT LEAST 14 DAYS PRIOR TO COMMENCING CONSTRUCTION. THE NOI MUST BE SUBMITTED TO STORM WATER NOTICE OF INTENT (4203M), USEPA, 1200 PENNSYLVANIA AVE. NW, WASHINGTON, DC 20460.
- THE CGP OUTLINES A SET OF PROVISIONS MANDATING THE OWNER AND CONTRACTOR TO COMPLY WITH THE REQUIREMENTS OF THE NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) STORM WATER REGULATIONS, INCLUDING, BUT NOT LIMITED TO, STORM WATER POLLUTION PREVENTION PLANS (SWPPP'S), IMPLEMENTATION OF EROSION AND SEDIMENTATION CONTROLS, EQUIPMENT MAINTENANCE GUIDELINES, ETC. PLEASE CONTACT USEPA OFFICE OF WASTEWATER MANAGEMENT AT 202-564-9545 OR AT WWW.EPA.GOV/NPDES/STORMWATER FOR ADDITIONAL INFORMATION. FOR FURTHER ASSISTANCE, CONTACT ABBY SWAINE OF NEW ENGLAND'S EPA REGION 1 AT 617-918-1841.

### NOTES

- IT IS BEING PROPOSED TO IS TO CONSTRUCT A 40,000 SF (1-STORY) ADDITION TO THE EXISTING WAREHOUSE/MANUFACTURING BUILDING, EXPANDED PARKING AND LOADING AREAS AND ASSOCIATED SITE IMPROVEMENTS.
- TOTAL SITE AREA: 9.03 AC  
TOTAL AREA OF DISTURBANCE: 5.90 AC
  - SOILS SHOWN ARE FROM THE SOIL SURVEY OF STRAFFORD COUNTY, NH, EASTERN PART, PREPARED BY USDA-SOIL CONSERVATION SERVICES.
  - STORM WATER DRAINAGE SYSTEM IS SHOWN ON THE PLAN. SEE GRADING & DRAINAGE PLAN FOR RIM, INVERT, PIPE LENGTH, AND SLOPE INFORMATION.  
POST-CONSTRUCTION RUNOFF COEFFICIENT: C = 80  
IMPERVIOUS SURFACE AREA: 5.7E AC
  - STABILIZATION PRACTICES FOR EROSION AND SEDIMENTATION CONTROLS:
    - TEMPORARY STABILIZATION - TOPSOIL STOCKPILES AND DISTURBED AREAS OF THE CONSTRUCTION SITE THAT WILL NOT BE REDISTURBED FOR 14 DAYS OR MORE MUST BE STABILIZED BY THE 14TH DAY AFTER THE LAST DISTURBANCE. THE TEMPORARY SEED SHALL BE ANNUAL RYE APPLIED AT THE RATE OF 1.1 LBS PER 1,000 SF. PRIOR TO SEEDING, A MINIMUM OF 2 TONS PER ACRE OF AGRICULTURAL LIMESTONE AND 500 LBS PER ACRE OF 10-20-20 FERTILIZER SHALL BE APPLIED. AFTER SEEDING, EACH AREA SHALL BE MULCHED WITH 1.5 TONS PER ACRE OF HAY MULCH. MULCH TO BE ANCHORED IN PLACE WHERE NECESSARY. AREAS OF THE SITE THAT WILL BE PAVED WILL BE TEMPORARILY STABILIZED BY APPLYING GEOTEXTILES AND A STONE SUB-BASE UNTIL BITUMINOUS PAVEMENT CAN BE APPLIED. CALCIUM CHLORIDE SHALL BE USED FOR DUST CONTROL IF NEEDED.
    - PERMANENT STABILIZATION - DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES PERMANENTLY CEASES SHALL BE STABILIZED WITH PERMANENT SEED NO LATER THAN 3 DAYS AFTER THE LAST CONSTRUCTION ACTIVITY. THE PERMANENT SEED MIX SHALL BE AS SPECIFIED BY THE LANDSCAPE PLAN NOTES OR MAY OTHERWISE CONSIST OF 0.45 LBS/1,000 SF TALL FESCUE, 0.20 LBS/1,000 SF CREEPING RED FESCUE, AND 0.20 LBS/1,000 SF BIRDFOOT TREFOIL. PRIOR TO SEEDING, A MINIMUM OF 2 TONS PER ACRE OF AGRICULTURAL LIMESTONE AND 500 LBS PER ACRE IF 10-20-20 FERTILIZER SHALL BE APPLIED. AFTER SEEDING, EACH AREA SHALL BE MULCHED WITH 1.5 TONS PER ACRE OF HAY MULCH. MULCH TO BE ANCHORED IN PLACE WHERE NECESSARY.
  - STRUCTURAL PRACTICES FOR EROSION AND SEDIMENTATION CONTROL
    - SILT SOCK - WILL BE CONSTRUCTED AROUND THE PERIMETER OF THE DISTURBED AREAS AND WILL DELINEATE THE LIMITS OF WORK FOR THE PROPOSED CONSTRUCTION. THE SILT SOCK WILL BE INSTALLED BY OTHERS. POSTS SHALL BE USED WITH AT LEAST 6" OF THE POST BURIED BELOW THE GROUND SURFACE TO PREVENT THE SILT SOCK FROM FORMING GAPS NEAR THE GROUND SURFACE. RUNOFF WILL FLOW THROUGH THE OPENINGS IN THE SILT SOCK WHILE RETAINING THE SEDIMENT WITHIN THE CONSTRUCTION AREA.
    - SILT FENCE - WILL BE CONSTRUCTED AROUND THE PERIMETER OF THE DISTURBED AREAS AND WILL DELINEATE THE LIMITS OF WORK FOR THE PROPOSED CONSTRUCTION. THE SILT FENCE WILL BE INSTALLED BY STRETCHING REINFORCED FILTER FABRIC BETWEEN POSTS WITH AT LEAST 8" OF THE FABRIC BURIED BELOW THE GROUND SURFACE TO PREVENT GAPS FROM FORMING NEAR THE GROUND SURFACE. RUNOFF WILL FLOW THROUGH THE OPENINGS IN THE FILTER FABRIC WHILE RETAINING THE SEDIMENT WITHIN THE CONSTRUCTION AREA.
    - STABILIZED CONSTRUCTION ENTRANCE - WILL BE INSTALLED IN ACCORDANCE WITH THE DETAIL AT THE ENTRANCE TO THE CONSTRUCTION SITE TO HELP REDUCE VEHICLE TRACKING OF SEDIMENTS OFF THE SITE. THE STABILIZED ENTRANCE WILL BE 20'-WIDE AND FLARE AT THE ENTRANCE TO THE PAVED ROAD AND HAVE A DEPTH OF 12" OF STONE. THE STABILIZED ENTRANCE SHALL BE MAINTAINED UNTIL THE REMAINDER OF THE CONSTRUCTION SITE HAS BEEN FULLY STABILIZED. THE PAVED STREET ADJACENT TO THE SITE SHALL BE SWEEPED ON A WEEKLY BASIS TO REMOVE EXCESS MUD AND DIRT FROM BEING TRACKED FROM THE SITE. TRUCKS HAULING MATERIAL TO AND/OR FROM THE SITE SHALL BE COVERED WITH A TARP/AULIN.
    - CATCH BASINS - WILL BE CLEANED ON AN ANNUAL BASIS TO REMOVE ALL SEDIMENTS FROM THE CATCH BASIN SUMPS.
    - CATCH BASIN PROTECTION - WILL BE INSTALLED AT ALL CATCH BASINS WITHIN THE CONSTRUCTION AREA. FILTER FABRIC WILL BE INSTALLED AROUND THE GRATES OF CATCH BASINS THAT ARE LOCATED IN THE TRAVEL WAY AND STONE/FILTER FABRIC PROTECTION WILL BE INSTALLED AT THE CATCH BASINS FOUND WITHIN THE PARKING AREA AND GRASS.
    - BLANKET SLOPE PROTECTION - SHALL BE INSTALLED ON ALL 2:1 SLOPES OR STEEPER ON SITE. ANCHOR THE TOP OF THE BLANKET BY ANCHORING THE BLANKET IN A 6" DEEP TRENCH. BACKFILL AND COMPACT TRENCH AFTER STAPLING. ROLL THE BLANKET IN THE DIRECTION OF STORM WATER FLOW. WHERE 2 OR MORE STRIPS OF BLANKET ARE REQUIRED, A MINIMUM OF 4" OF OVERLAP SHALL BE PROVIDED.
    - STONE CHECK DAMS - WILL BE INSTALLED IN EXISTING AND PROPOSED GRASS SWALES TO REDUCE THE VELOCITY OF CONCENTRATED STORM WATER FLOWS AND PREVENT EROSION OF THE SWALE.

- THRUST BLOCK SHALL BE PROVIDED WHERE WATER LINE CHANGES DIRECTION OR TAPS INTO EXISTING WATER LINE.
- A LIST OF CONSTRUCTION ITEMS AND OTHER PRODUCTS USED ON THIS PROJECT SHALL BE KEPT ON RECORD WITH THIS PLAN ONSITE. ALL CHEMICALS, PETROLEUM PRODUCTS AND OTHER MATERIALS USED DURING CONSTRUCTION SHALL BE STORED IN A SECURE AREA, AND PRECAUTIONS USED TO PREVENT POTENTIAL SOURCES OF CONTAMINATION OR POLLUTION. ANY SPILL OF THESE TYPES OF SUBSTANCES SHALL BE CLEANED UP AND DISPOSED OF IN A LEGAL MANNER AS SPECIFIED BY STATE REGULATIONS AND THE MANUFACTURER. ANY SPILL IN AMOUNTS EQUAL TO OR EXCEEDING REPORTABLE QUANTITY AS DEFINED BY THE EPA SHALL TAKE THE FOLLOWING STEPS:
  - NOTIFY THE NATIONAL RESPONSE CENTER IMMEDIATELY AT (888) 424-8802; IN WASHINGTON, D.C., CALL (202) 426-2675.
  - WITHIN 14 DAYS, SUBMIT A WRITTEN DESCRIPTION OF THE RELEASE TO THE EPA REGIONAL OFFICE PROVIDING THE DATE AND CIRCUMSTANCES OF THE RELEASE AND THE STEPS TO BE TAKEN TO PREVENT ANOTHER RELEASE.
  - MODIFY THE POLLUTION PREVENTION PLAN TO INCLUDE THE INFORMATION LISTED ABOVE.

**GOOD HOUSEKEEPING:**  
THE FOLLOWING GOOD HOUSEKEEPING PRACTICES WILL BE FOLLOWED ONSITE DURING THE CONSTRUCTION PROJECT:

- AN EFFORT WILL BE MADE TO STORE ONLY ENOUGH PRODUCT REQUIRED TO DO THE JOB;
- ALL MATERIALS STORED ONSITE WILL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR APPROPRIATE CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE;
- PRODUCTS WILL BE KEPT IN THEIR ORIGINAL CONTAINERS WITH THE ORIGINAL MANUFACTURER'S LABEL;
- SUBSTANCES WILL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER;
- WHENEVER POSSIBLE, ALL OF A PRODUCT WILL BE USED UP BEFORE DISPOSING OF THE CONTAINER;
- MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL WILL BE FOLLOWED;
- TRASH DUMPSTERS SHALL BE GASKETED OR HAVE A SECURE WATERTIGHT LID AND BE PLACED AWAY FROM STORMWATER CONVEYANCES AND DRAINS.
- THE SITE SUPERINTENDENT WILL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS ONSITE.

**HAZARDOUS PRODUCTS:**  
THESE PRACTICES ARE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:

- PRODUCTS WILL BE KEPT IN ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE;
- ORIGINAL LABELS AND MATERIAL SAFETY DATA WILL BE RETAINED; THEY CONTAIN IMPORTANT PRODUCT INFORMATION;
- IF SURPLUS PRODUCT MUST BE DISPOSED OF, MANUFACTURER'S OR LOCAL AND STATE RECOMMENDED METHODS FOR PROPER DISPOSAL WILL BE FOLLOWED.

**PRODUCT SPECIFIC PRACTICES:**  
THE FOLLOWING PRODUCT SPECIFIC PRACTICES WILL BE FOLLOWED ON 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. ANY ASPHALT SUBSTANCES USED ONSITE WILL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

**FERTILIZERS:**  
FERTILIZERS USED WILL BE APPLIED ONLY IN THE MINIMUM AMOUNTS RECOMMENDED BY THE MANUFACTURER. ONCE APPLIED, FERTILIZER WILL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORM WATER. STORAGE WILL BE IN A COVERED SHED. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER WILL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.

**PAINTS:**  
ALL CONTAINERS WILL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE. EXCESS PAINT WILL NOT BE DISCHARGED TO THE STORM SEWER BUT WILL BE PROPERLY DISPOSED OF ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.

**CONCRETE TRUCKS:**  
EXCESS CONCRETE SHALL BE USED IN AREAS DESIGNATED BY THE SITE CONTRACTOR. WASH WATER SHALL BE DISPOSED OF USING BEST MANAGEMENT PRACTICES. BUILDING CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL DRUM WASH WATER ASSOCIATED WITH CONCRETE FOR THE BUILDING PAD. SITE CONTRACTOR TO COORDINATE AND PROVIDE BUILDING CONTRACTOR WITH AN AREA FOR DRUM WASH WATER.

**SPILL CONTROL PRACTICES:**  
IN ADDITION TO THE GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTIONS OF THIS PLAN, THE FOLLOWING PRACTICES WILL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:

- MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP WILL BE CLEARLY POSTED AND SITE PERSONNEL WILL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES.
- MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP WILL BE KEPT IN THE MATERIAL STORAGE AREA ONSITE. EQUIPMENT AND MATERIALS WILL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUST PANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST, AND PLASTIC AND METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE.
- ALL SPILLS WILL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY.
- THE SPILL AREA WILL BE KEPT WELL VENTILATED AND PERSONNEL WILL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE.
- SPILLS OF TOXIC OR HAZARDOUS MATERIAL WILL BE REPORTED TO THE APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY, REGARDLESS OF SIZE.
- THE SPILL PREVENTION PLAN WILL BE ADJUSTED TO INCLUDE MEASURES TO PREVENT THIS TYPE OF SPILL FROM REOCCURRING AND HOW TO CLEAN UP THE SPILL IF THERE IS ANOTHER ONE. A DESCRIPTION OF THE SPILL, WHAT CAUSED IT, AND THE CLEANUP MEASURES WILL ALSO BE INCLUDED.
- THE SITE SUPERINTENDENT RESPONSIBLE FOR THE DAY-TO-DAY SITE OPERATIONS, WILL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR. THEY WILL DESIGNATE AT LEAST THREE OTHER SITE PERSONNEL WHO WILL EACH RECEIVE SPILL PREVENTION AND CLEANUP TRAINING. THESE INDIVIDUALS WILL EACH BECOME RESPONSIBLE FOR A PARTICULAR PHASE OF PREVENTION AND CLEANUP. THE NAMES OF RESPONSIBLE SPILL PERSONNEL WILL BE POSTED IN THE MATERIAL STORAGE AREA AND IN THE OFFICE TRAILER ONSITE.

11. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN RECORDS OF CONSTRUCTION ACTIVITIES, INCLUDING DATES OF MAJOR GRADING ACTIVITIES, DATES WHEN CONSTRUCTION ACTIVITIES HAVE TEMPORARILY CEASED ON A PORTION OF THE SITE, DATES WHEN WORK IS COMPLETED ON A PORTION OF THE SITE, AND DATES WHEN STABILIZATION MEASURES ARE INITIATED ONSITE.

12. THE CONTRACTOR SHALL PERFORM INSPECTIONS OR HAVE A CONSULTING ENGINEER PERFORM INSPECTIONS EVERY SEVEN (7) DAYS WITHIN 24 HOURS AFTER A STORM OF 0.5" OR GREATER. INSPECTION REPORTS ARE TO BE KEPT ON FILE AT THE SITE WITH THIS PLAN. MAINTENANCE OR MODIFICATION SHALL BE IMPLEMENTED AND ADDED TO THE PLAN AS RECOMMENDED BY THE QUALIFIED INSPECTOR.

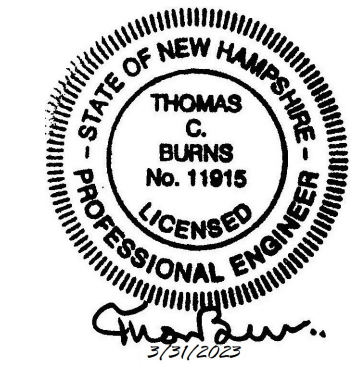
## SITE DEVELOPMENT PLANS

TAX MAP 52 LOT 112A  
**STORMWATER MANAGEMENT PLAN**  
C/A DESIGN, INC.  
131 PORTSMOUTH AVE. EXETER NH

OWNED BY  
**NH EXETER PROPERTIES, LLC**  
PREPARED FOR  
**C/A DESIGN, INC.**

SCALE: 1"=60'

FEBRUARY 28, 2023



REV	DATE	DESCRIPTION	DR	CK
1	3/31/2023	REVISED PER EXETER TRC REVIEW	JD	TCB

FILE	45659-51	DR	JED	FB	-	C-9
	CK	TCB	CADFILE	45659-51 CIVIL SITE PRODUCTION		

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Fax (603) 472-9747  
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## CONSTRUCTION SEQUENCE NOTES

1. INSTALL STABILIZED CONSTRUCTION ENTRANCE.
  2. CUT AND CLEAR TREES WITHIN AREA OF DISTURBANCE UNLESS OTHERWISE NOTED.
  3. CONSTRUCT TEMPORARY AND PERMANENT EROSION CONTROL FACILITIES PRIOR TO ANY EARTH MOVING OPERATION.
  4. ROUGH GRADE SITE OR PHASED WORK AREA. ALL SLOPES SHALL BE STABILIZED IMMEDIATELY AFTER GRADING. ALL DISTURBED AREAS SHALL BE STABILIZED NO LATER THAN 72 HOURS AFTER CONSTRUCTION ACTIVITY CEASES. IF EARTHWORK TEMPORARILY CEASES ON A PORTION OF OR THE ENTIRE SITE, AND WILL NOT RESUME WITHIN 21 DAYS, THE AREA SHALL BE STABILIZED.  
AN AREA SHALL BE CONSIDERED STABILIZED IF:  
A) BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;  
B) A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;  
C) A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH STONE OR RIPRAP HAS BEEN INSTALLED, OR  
D) EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
  5. CONSTRUCT CULVERTS, DETENTION BASINS AND TREATMENT SWALES. PLACE HEADWALLS, RIP-RAP AND OTHER DRAINAGE FACILITIES ACCORDING TO PLAN.
  6. THE CONTRACTOR SHALL STABILIZE ALL DITCHES, SWALES, AND PONDS/BASINS PRIOR TO DIRECTING FLOW TO THEM.
  7. INSTALL ALL UNDERGROUND UTILITIES.
  8. CONSTRUCT BUILDINGS.
  9. CONSTRUCT PARKING AND FINISH GRADE SITE ACCORDING TO PLAN.
  10. ALL SLOPES SHALL BE STABILIZED IMMEDIATELY AFTER GRADING. DITCHES AND SWALES SHALL BE STABILIZED PRIOR TO DIRECTING FLOW TO THEM. INSPECT AND MAINTAIN ALL EROSION AND SEDIMENTATION CONTROL MEASURES PERIODICALLY AND IMMEDIATELY AFTER STORM EVENTS.
  11. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
  12. REMOVE TEMPORARY EROSION CONTROL MEASURES ONCE ALL AREAS ARE STABILIZED WITH A SUITABLE STAND OF GRASS, PAVEMENT OR COMPACTED GRAVELS.
- \* REFER TO THE STORM WATER MANAGEMENT PLAN FOR EROSION CONTROL MEASURES AND SPECIFIC INFORMATION.

## GENERAL NOTES

1. ALL IN-PAVEMENT MANHOLES SHALL HAVE RIMS SET TO FINISH GRADE REGARDLESS OF ELEVATIONS OTHERWISE SHOWN.
2. THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES OWNING UTILITIES, EITHER OVERHEAD OR UNDERGROUND, WITHIN THE CONSTRUCTION AREA AND SHALL COORDINATE AS NECESSARY WITH THE UTILITY COMPANIES OF SAID UTILITIES. THE PROTECTION OR RELOCATION OF UTILITIES IS ULTIMATELY THE RESPONSIBILITY OF THE CONTRACTOR.
3. THE CONTRACTOR SHALL MAINTAIN EMERGENCY ACCESS TO ALL AREAS AFFECTED BY HIS WORK AT ALL TIMES.
4. ALL EXCAVATIONS SHALL BE THOROUGHLY SECURED ON A DAILY BASIS BY THE CONTRACTOR AT THE COMPLETION OF CONSTRUCTION OPERATIONS IN THE IMMEDIATE AREA.
5. EROSION CONTROL SYSTEMS SHALL BE INSTALLED AND MAINTAINED FOR THE DURATION OF THE PROJECT IN ACCORDANCE WITH APPLICABLE NHDES STANDARDS. THESE DETAILS SERVE AS A GUIDE ONLY.
6. REFER TO THE TOWN STANDARD DETAILS, LATEST REVISION, FOR ADDITIONAL INFORMATION AND CRITERIA.
7. THE CONTRACTOR SHALL STABILIZE ALL DITCHES, SWALES, AND PONDS PRIOR TO DIRECTING FLOW TO THEM.
8. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION.
9. RUNOFF MUST BE DIRECTED TO TEMPORARY PRACTICES UNTIL STORMWATER BMPs ARE STABILIZED.
10. EROSION CONTROL PRACTICES ARE TO BE INSPECTED WEEKLY AND AFTER 0.5" OF RAINFALL.
11. CUT AND FILL SLOPES MUST BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
12. ROADWAYS AND PARKING AREAS MUST BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.

## WINTER CONSTRUCTION

- IN ADDITION TO THE OTHER NOTES CONTAINED ON THIS PLAN, THE FOLLOWING MUST BE IMPLEMENTED:
1. WINTER EXCAVATION AND EARTHWORK SHALL BE COMPLETED AS SUCH THAT NO MORE THAN 1 ACRE OF THE SITE IS WITHOUT STABILIZATION AT ANY ONE TIME.
  2. AN AREA WITHIN 100 FEET OF A PROTECTED NATURAL RESOURCE MUST BE PROTECTED WITH A DOUBLE ROW OF SEDIMENT BARRIER.
  3. TEMPORARY MULCH MUST BE APPLIED WITHIN 7 DAYS OF SOIL EXPOSURE OR PRIOR TO ANY STORM EVENT, BUT AFTER EVERY WORKDAY IN AREAS WITHIN 100 FEET FROM A PROTECTED NATURAL RESOURCE.
  4. AREAS THAT HAVE BEEN BROUGHT TO FINAL GRADE MUST BE PERMANENTLY MULCHED THE SAME DAY.
  5. IN THE EVENT OF A SNOWFALL GREATER THAN 1 INCH (FRESH OR CUMULATIVE), THE SNOW SHALL BE REMOVED FROM THE AREAS DUE TO BE SEEDED AND MULCHED.
  6. LOAM SHALL BE FREE OF FROZEN CLUMPS BEFORE IT IS APPLIED.
  7. A DITCH THAT WILL BE CONSTRUCTED DURING THE WINTER MUST BE STABILIZED WITH RIPRAP.

## OVERWINTER STABILIZATION

1. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
2. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
3. DO NOT EXPOSE SLOPES OR LEAVE SLOPES EXPOSED OVER THE WINTER OR FOR ANY OTHER EXTENDED TIME OF WORK SUSPENSION UNLESS FULLY PROTECTED WITH MULCH.
4. SEE THE VEGETATION MEASURES FOR MORE INFORMATION ON SEEDING DATES AND TYPES.
5. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.

## CONTROL OF INVASIVE SPECIES

DURING CONSTRUCTION ACTIVITIES, CHECK FOR THE PRESENCE OF INVASIVE PLANTS. IF INVASIVE PLANTS ARE FOUND, THEY SHALL BE CONTROLLED AND REMOVED IN A SAFE MANNER AS OUTLINED IN THE UNIVERSITY OF NEW HAMPSHIRE COOPERATIVE EXTENSION'S METHODS FOR DISPOSING NON-NATIVE INVASIVE PLANTS AND PER NEW HAMPSHIRE REGULATIONS AS OUTLINED IN AGR. 3802.04.

## EROSION CONTROL NOTES

- DURING CONSTRUCTION AND THEREAFTER, EROSION CONTROL MEASURES ARE TO BE IMPLEMENTED AS NOTED:
1. INSTALLATION OF SILTATION FENCES AND OTHER EROSION CONTROL MEASURES SHALL BE COMPLETED PRIOR TO THE START OF SITE WORK IN ANY GIVEN AREA. PREFABRICATED SILTATION FENCES SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
  2. SILTATION FENCES AND OTHER EROSION CONTROL MEASURES SHALL BE KEPT CLEAN DURING CONSTRUCTION AND REMOVED WHEN ALL SLOPES HAVE A VEGETATIVE COVER OF GREATER THAN 85%. EROSION CONTROL MEASURES SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EVERY RAINFALL.
  3. EXISTING VEGETATION IS TO REMAIN UNDISTURBED WHEREVER POSSIBLE.
  4. THE AREA OF LAND EXPOSED AND THE TIME OF EXPOSURE SHALL BE MINIMIZED. ALL DISTURBED AREAS SHALL BE STABILIZED WITHIN 72 HOURS AFTER FINAL GRADING.
  5. ALL DISTURBED AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
  6. ALL DISTURBED AREAS SHALL HAVE A MINIMUM OF 4" OF LOAM. ACCEPTABLE SEED MIXES ARE AS FOLLOWS:

**TYPICAL LAWN MIX (MIN. 200 LBS/ACRE):**  
 33% CREEPING RED FESCUE (MIN. 66 LBS/ACRE)  
 42% PERENNIAL RYEGRASS (MIN. 84 LBS/ACRE)  
 21% KENTUCKY BLUEGRASS (MIN. 42 LBS/ACRE)  
 4% REDTOP (MIN. 8 LBS/ACRE)

**TEMPORARY LAWN MIX (MIN. 47 LBS/ACRE):**  
 100% ANNUAL RYE

**WILDFLOWER SLOPE (NHDOT TYPE 45) MIX 3:1 OR GREATER SLOPES (MIN. 160 LBS/ACRE):**

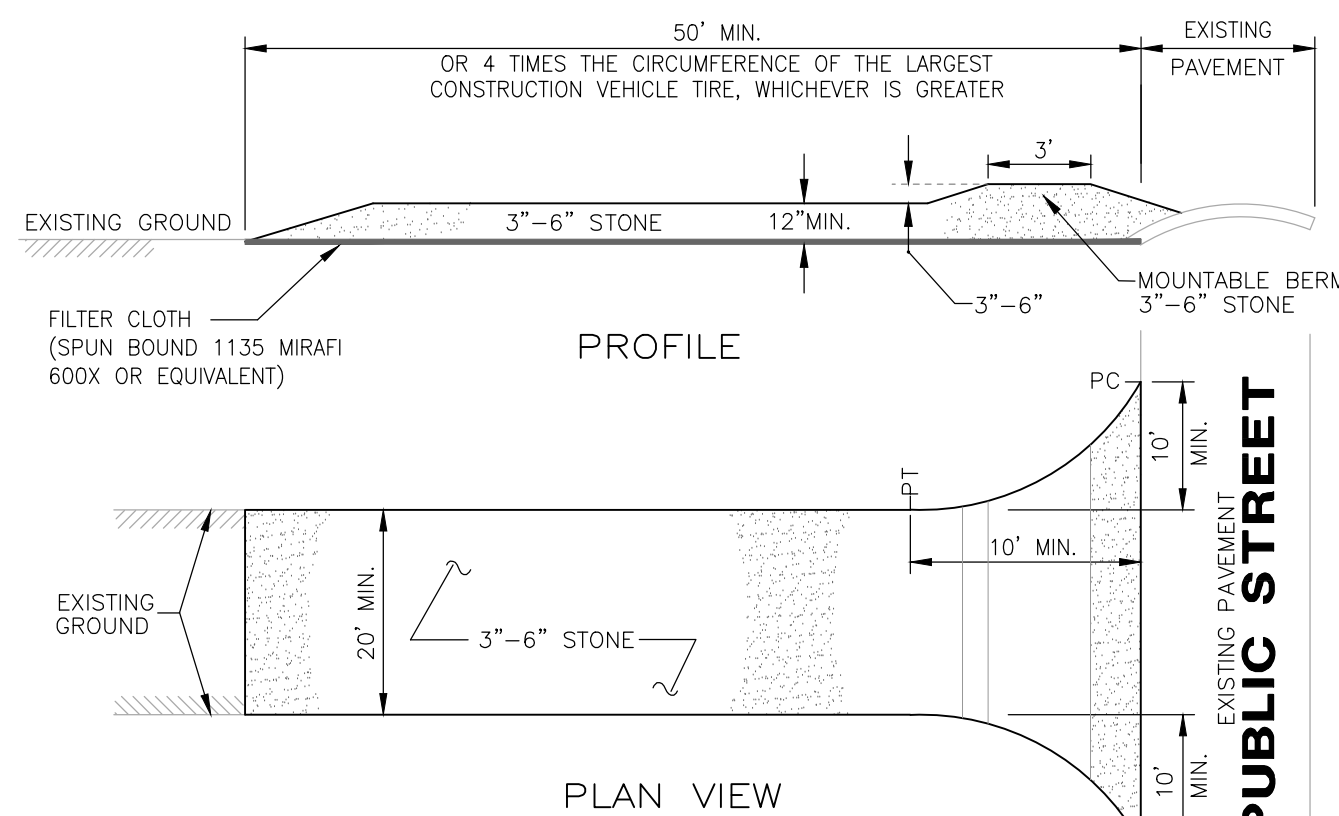
38% CREEPING RED FESCUE (MIN. 60 LBS/ACRE)  
 32% PERENNIAL RYEGRASS (MIN. 51 LBS/ACRE)  
 5% REDTOP (MIN. 8 LBS/ACRE)  
 5% ALSIKE CLOVER (MIN. 8 LBS/ACRE)  
 5% BIRDSFOOT TREFLOIL (MIN. 8 LBS/ACRE)  
 3% LANCE-LEAF COREOPSIS (MIN. 3 LBS/ACRE)  
 3% OXEYE DAISY (MIN. 3 LBS/ACRE)  
 3% BUTTERFLY WEED (MIN. 3 LBS/ACRE)  
 3% BLACKEYED SUSAN (MIN. 3 LBS/ACRE)  
 3% WILD LUPINE (MIN. 3 LBS/ACRE)

**GENERAL SLOPE (NHDOT TYPE 44) MIX 3:1 OR GREATER SLOPES (MIN. 160 LBS/ACRE):**

44% CREEPING RED FESCUE (MIN. 70 LBS/ACRE)  
 38% PERENNIAL RYEGRASS (MIN. 60 LBS/ACRE)  
 6% REDTOP (MIN. 10 LBS/ACRE)  
 6% ALSIKE CLOVER (MIN. 10 LBS/ACRE)  
 6% BIRDSFOOT TREFLOIL (MIN. 10 LBS/ACRE)

- A. PLACING LOAM ON SITE
  - a. ALL SUBGRADE ELEVATIONS SHOULD BE UNIFORMLY GRADED TO RECEIVE LOAM AND SHALL BE INSPECTED AND APPROVED BY THE GENERAL CONTRACTOR PRIOR TO PLACEMENT OF LOAM.
  - b. PLACE LOAM TO FORM A MINIMUM DEPTH OF 4" WHEN ROLLED, UNLESS OTHERWISE INDICATED.
  - c. ALL DEPRESSIONS EXPOSED DURING THE ROLLING SHALL BE FILLED WITH ADDITIONAL LOAM.
- B. SEED BED PREPARATION
 

AFTER FINISH GRADING AND JUST BEFORE SEEDING, THE AREAS TO BE SEEDDED SHALL BE LOOSENEED TO PROVIDE A ROUGH, FIRM BUT FINELY PULVERIZED SEEDBED. THE INTENT IS A TEXTURE CAPABLE OF RETAINING WATER, SEED AND FERTILIZER WHILE REMAINING STABLE AND ALLOWING SEED TIME TO GERMINATE. SEED SHALL BE APPLIED TO THE CONDITIONED SEEDBED NOT MORE THAN 48 HOURS AFTER THE SEEDBED HAS BEEN PREPARED.
7. LIME AND FERTILIZER SHALL BE INCORPORATED INTO THE SOIL PRIOR TO OR AT THE TIME OF AT THE TIME OF SEEDING. A MINIMUM OF 2 TONS PER ACRE OF AGRICULTURAL LIMESTONE AND 500 LBS. PER ACRE OF 10-20-20 FERTILIZER SHALL BE APPLIED. SEEDING PRACTICES SHALL COMPLY WITH LOCAL USDA SOIL CONSERVATION SERVICES RECOMMENDATIONS.
8. HAY MULCH OR JUTE MATTING SHALL BE USED WHERE INDICATED ON THE PLANS. A MINIMUM OF 1.5 TONS OF MULCH PER ACRE SHALL BE APPLIED. MULCH SHALL BE ANCHORED IN PLACE WHERE NECESSARY. JUTE MATTING SHALL BE LAID IN THE DIRECTION OF RUNOFF FLOW AND APPLIED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
9. PERMANENT OR TEMPORARY COVER MUST BE IN PLACE BEFORE THE GROWING SEASON ENDS. WHEN SEEDDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 15 TO SEPTEMBER 15. NO DISTURBED AREA SHALL BE LEFT EXPOSED DURING WINTER MONTHS.
10. WATER SHALL BE USED FOR DUST CONTROL IN APPROPRIATE AREAS, IN ACCORDANCE WITH NHDES GUIDELINES.
11. THERE SHALL BE NO PLASTIC, OR MULTI-FILAMENT OR MONOFILAMENT POLYPROPYLENE NETTING OR MESH WITH AN OPENING SIZE OF GREATER THAN 1/8 INCHES MATERIAL UTILIZED.\* (NOT APPLICABLE TO TURF REINFORCEMENT MATS)
12. TURF REINFORCEMENT MATS SHALL BE COVERED WITH SOIL TO PREVENT EXPOSURE OF THE MATS TO THE SURFACE.

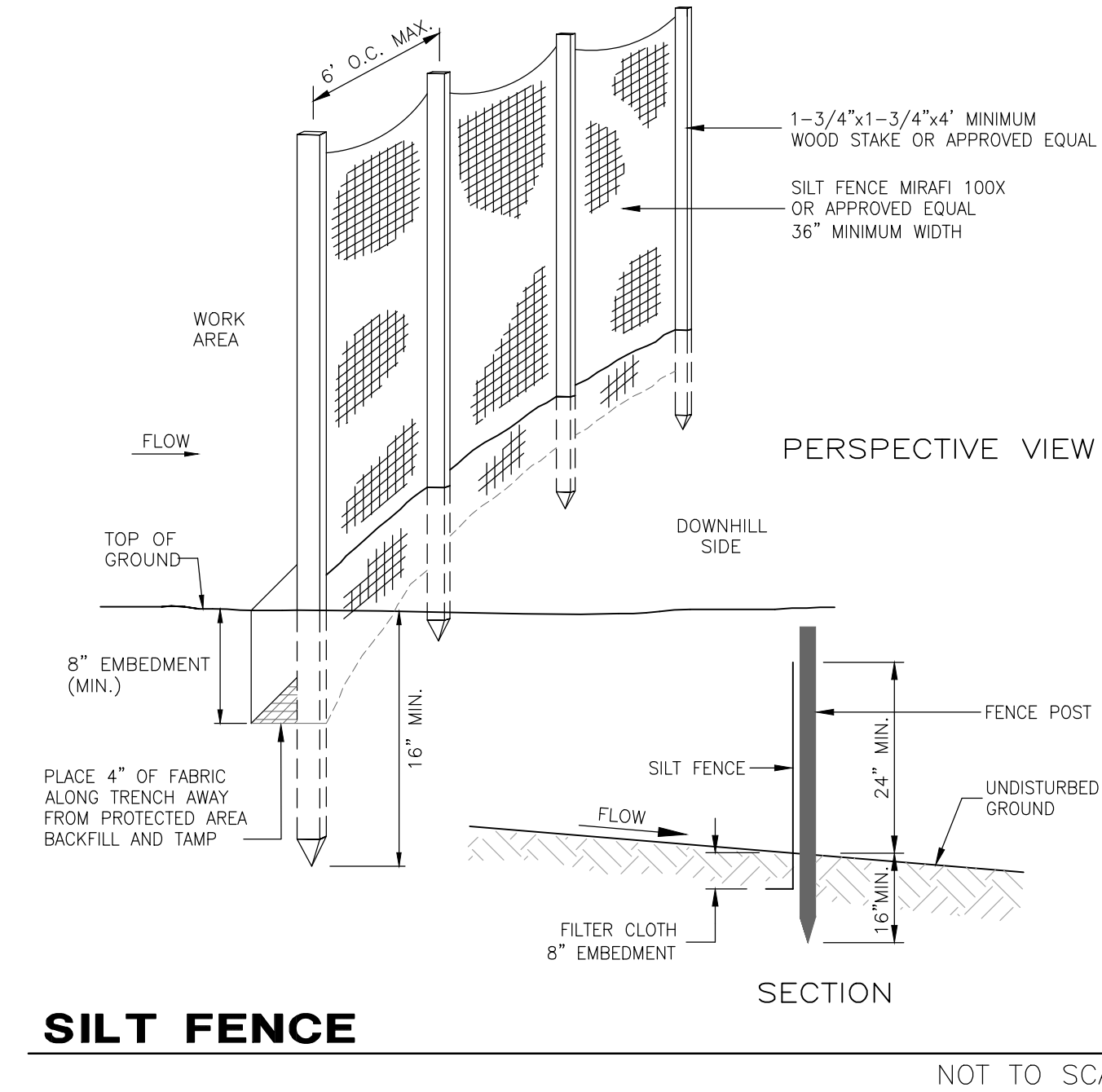


### NOTES

1. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE SURFACE.
2. NO SURFACE WATER SHALL BE DIRECTED TOWARD CONSTRUCTION ENTRANCES.
3. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
4. WASHING - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
5. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN STORM EVENT.

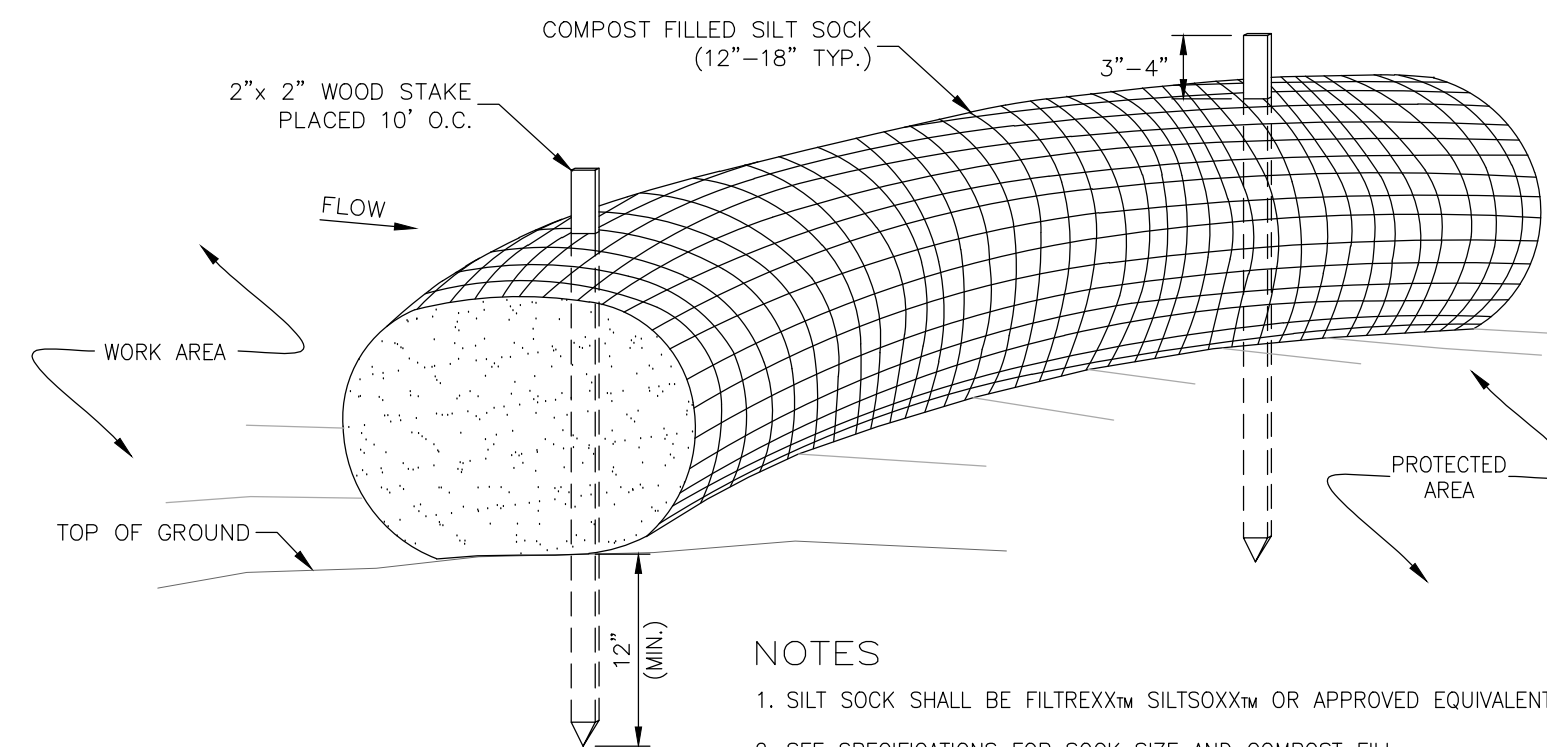
## STABILIZED CONSTRUCTION ENTRANCE

SEE PLAN FOR PROPOSED LOCATION NOT TO SCALE



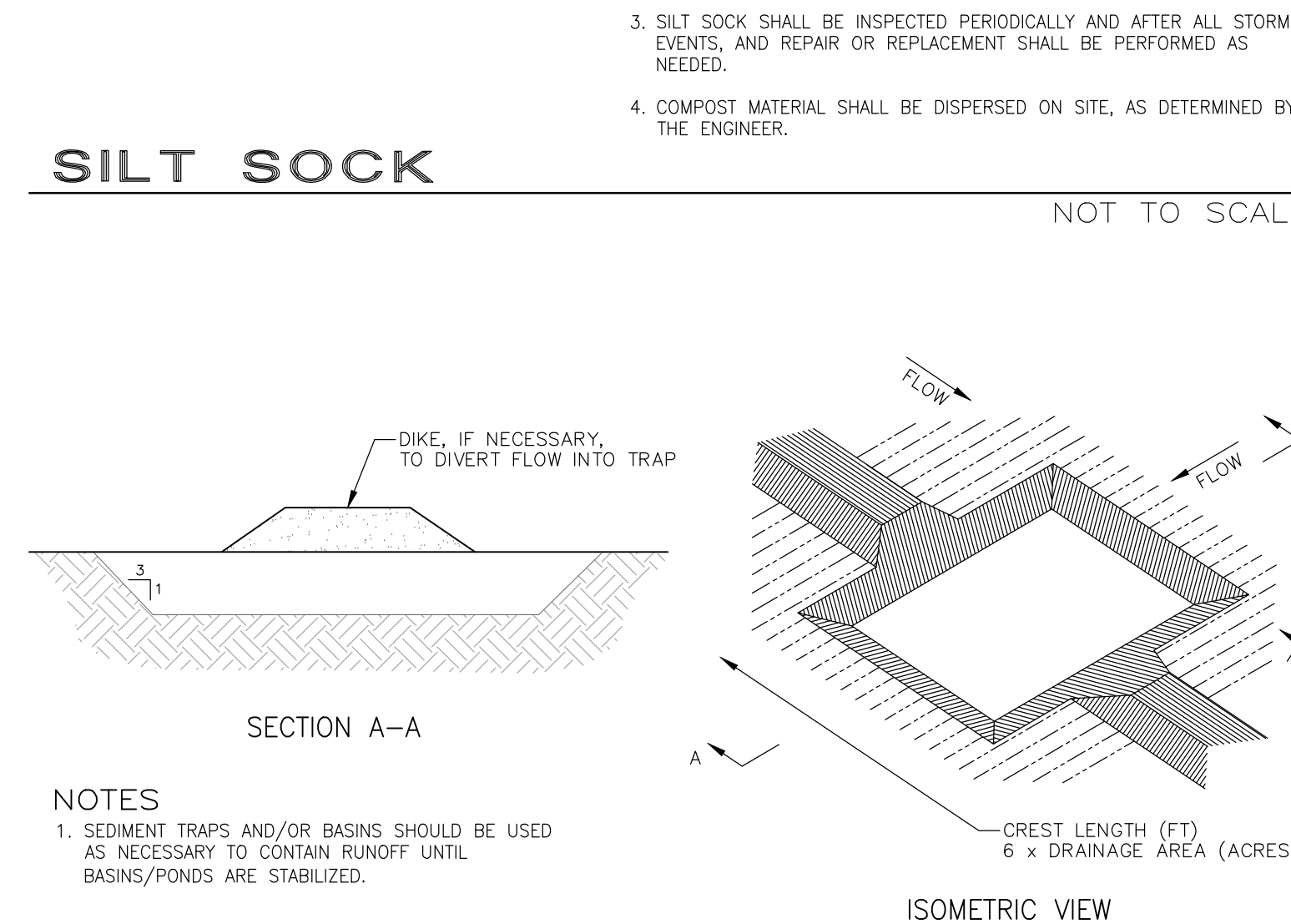
## SILT FENCE

NOT TO SCALE



## SILT SOCK

NOT TO SCALE

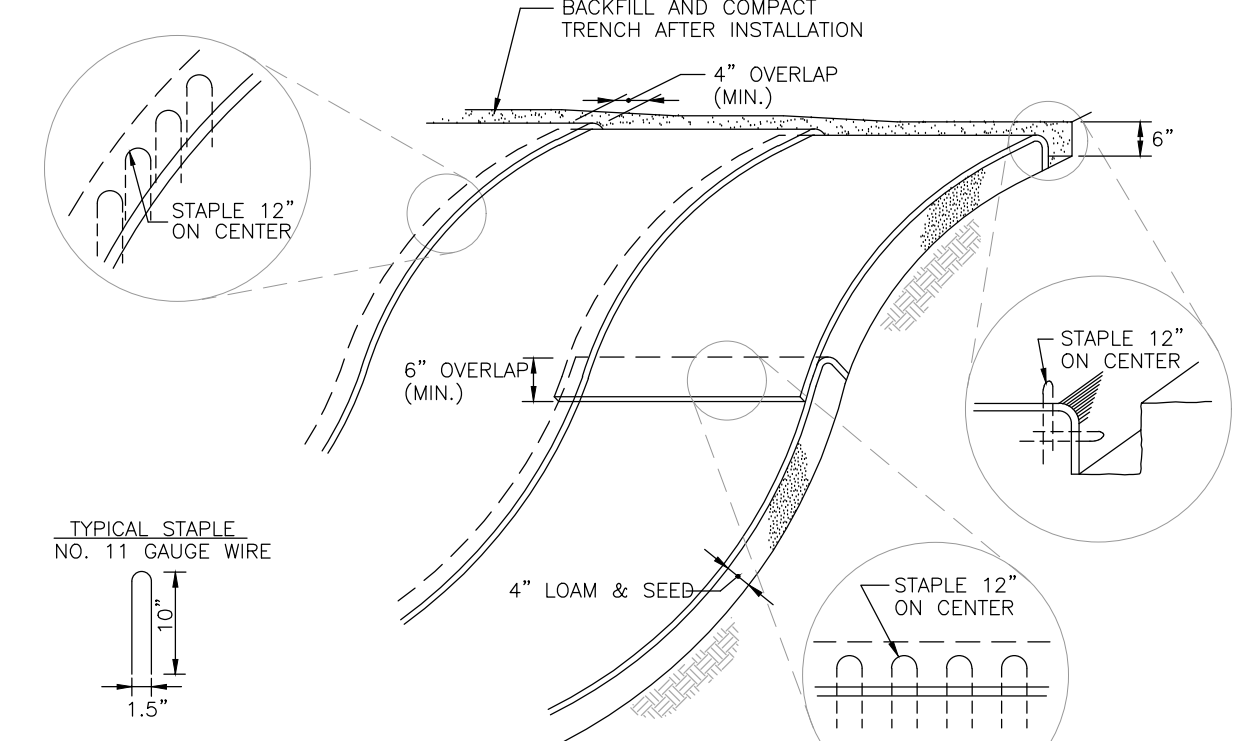


## SEDIMENT TRAP

NOT TO SCALE



REV	DATE	DESCRIPTION	DR	TCB
1	3/31/2023	REVISED PER EXETER TRC REVIEW	JD	TCB

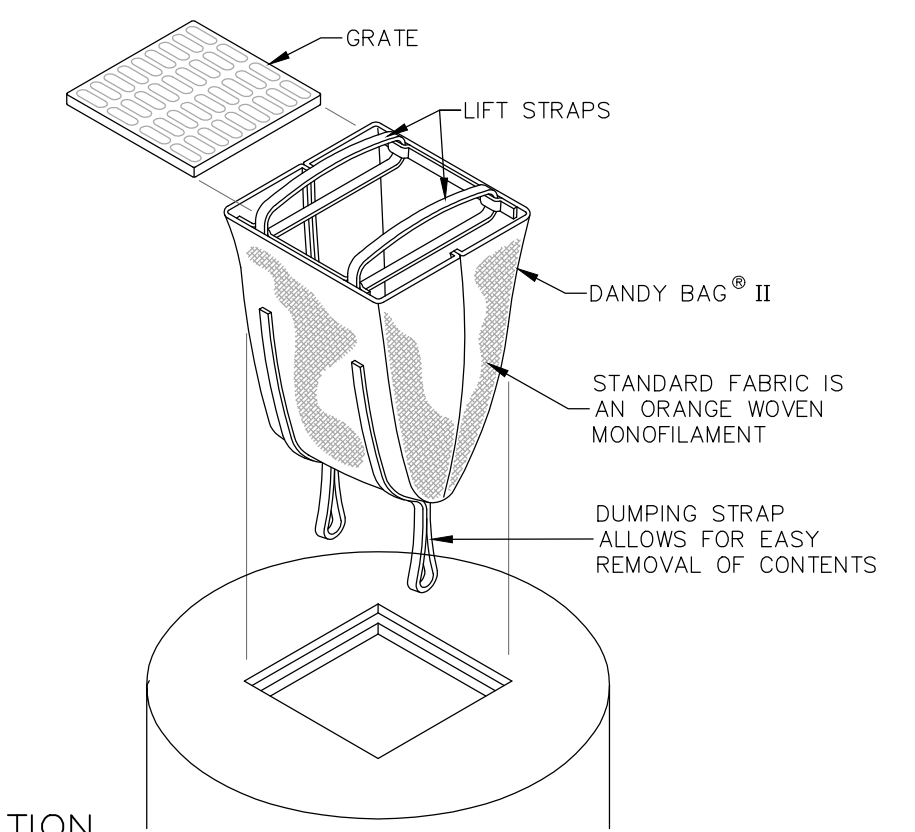


### NOTES

1. BEGIN AT THE TOP OF BLANKET INSTALLATION AREA BY ANCHORING BLANKET IN A 6" DEEP TRENCH. BACKFILL AND COMPACT TRENCH AFTER STAPLING.
2. ROLL THE BLANKET DOWN THE SWALE IN THE DIRECTION OF THE WATER FLOW.
3. THE EDGES OF BLANKETS MUST BE STAPLED WITH APPROX. 4 INCH OVERLAP WHERE 2 OR MORE STRIP WIDTHS ARE REQUIRED.
4. WHEN BLANKETS MUST BE SPLICED DOWN THE SWALE, PLACE BLANKET END OVER END WITH 6 INCH (MIN.) OVERLAP AND ANCHOR DOWN SLOPE BLANKET IN A 6 INCH DEEP TRENCH.
5. BLANKET SHALL BE NORTH AMERICAN GREEN C125BN, EAST COAST EROSION CONTROL ECC-2B, AMERICAN EXCELSIOR COMPANY CURLEX III FIBRENET, ROLANKA GEONATURAL EROSION & SEDIMENT CONTROL MATTE JUTEMAT OR BDD-00F 30, OR APPROVED EQUAL.
6. BLANKET SHALL NOT CONTAIN WELDED PLASTIC, PLASTIC, MULTI-FILAMENT, OR MONO-FILAMENT POLYPROPYLENE NETTING OR MESH.

## BLANKET SLOPE PROTECTION

FOR EROSION CONTROL NOT TO SCALE



### INSTALLATION

INSTALLATION: REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS; PLACE ABSORBENT PILLION IN UNIT. STAND THE GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO THE DANDY BAG II SO THAT THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING DEVICES, INSERT THE GRATE INTO THE INLET.

### MAINTENANCE

MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE DANDY BAG II. IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY UNIT, LIFT THE UNIT OUT OF THE INLET USING THE LIFTING STRAPS AND REMOVE THE GRATE. IF USING OPTIONAL OIL ABSORBENTS; REPLACE ABSORBENT WHEN NEAR SATURATION.

## DANDY BAG II

NOT TO SCALE

## SITE DEVELOPMENT PLANS

TAX MAP 52 LOT 112A

### DETAILS

C/A DESIGN, INC.

131 PORTSMOUTH AVE. EXETER NH

OWNED BY

NH EXETER PROPERTIES, LLC

PREPARED FOR

C/A DESIGN, INC.

SCALE: NTS

FEBRUARY 28, 2023



Civil Engineers  
 Structural Engineers  
 Traffic Engineers  
 Land Surveyors  
 Landscape Architects  
 Scientists

48 Constitution Drive  
 Bedford, NH 03110  
 Phone (603) 472-4488  
 Fax (603) 472-9747  
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FILE	45659-51	DR	JED	FB	-	C-10
REV	DATE	DESCRIPTION	DR	TCB	DESCRIPTION	DR

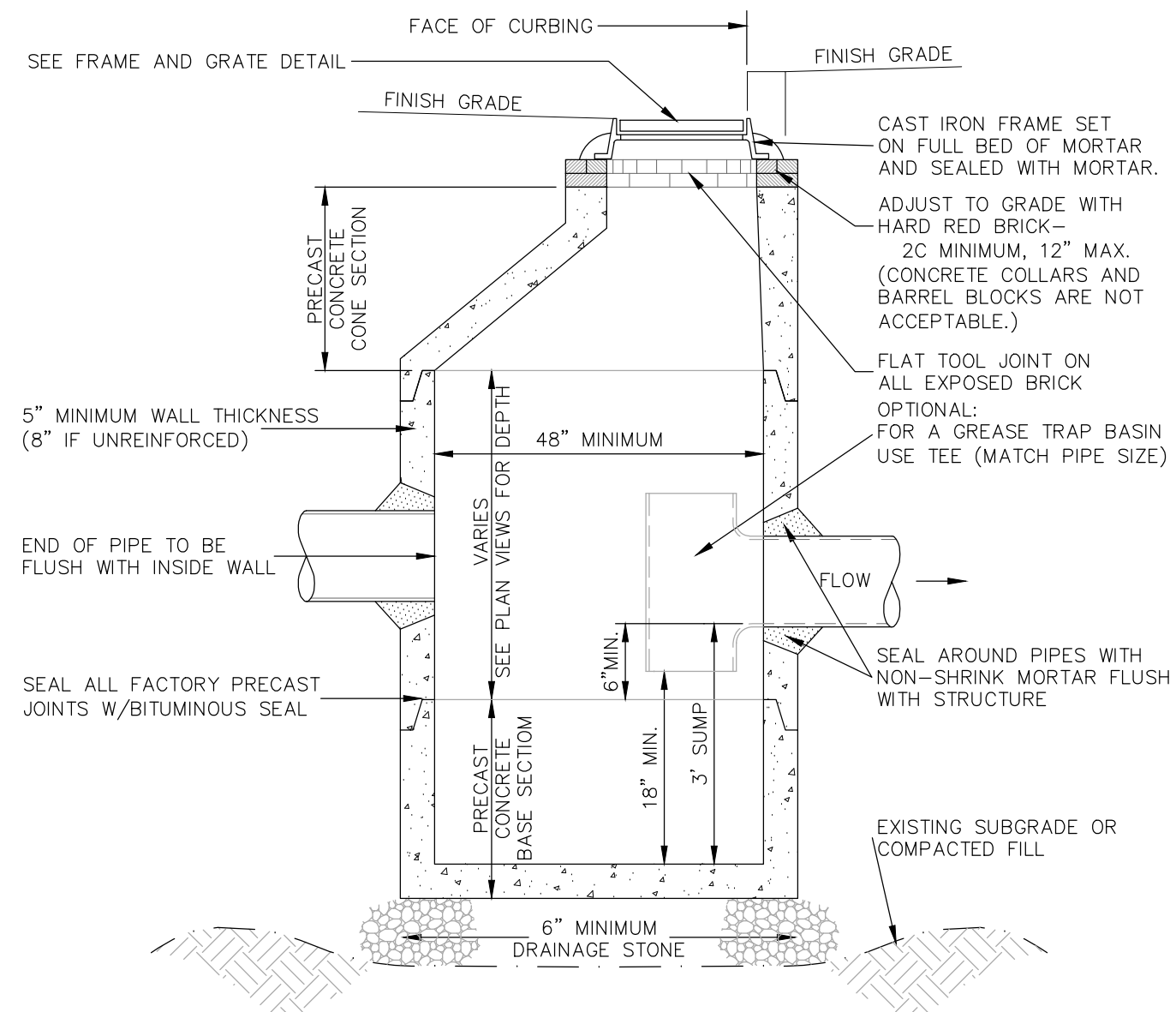
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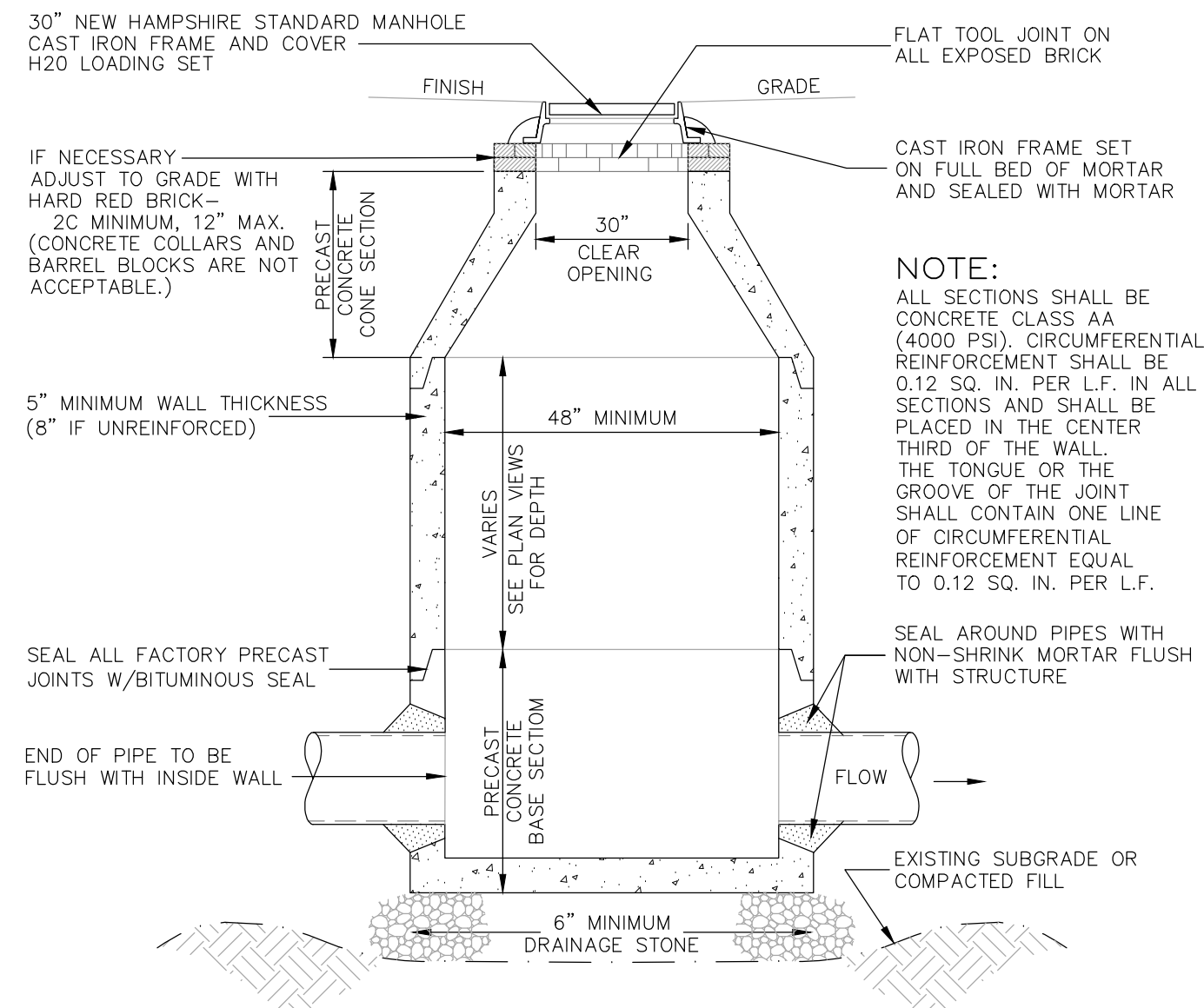




NOTE: ALL PRECAST SECTIONS SHALL CONFORM TO ASTM C-478

### CATCH BASIN

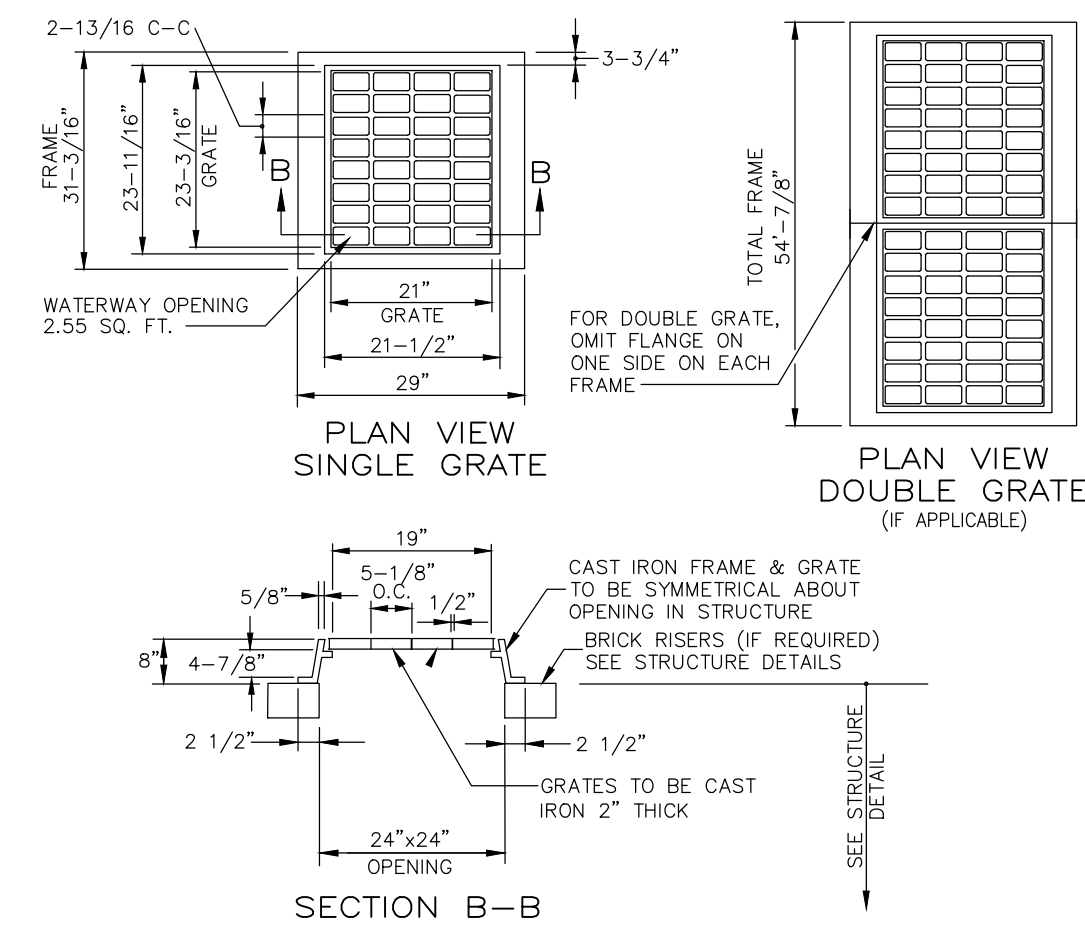
ECCENTRIC CONE (FOR USE IN CURBED AREAS) NOT TO SCALE



NOTE: ALL PRECAST SECTIONS SHALL CONFORM TO ASTM C-478

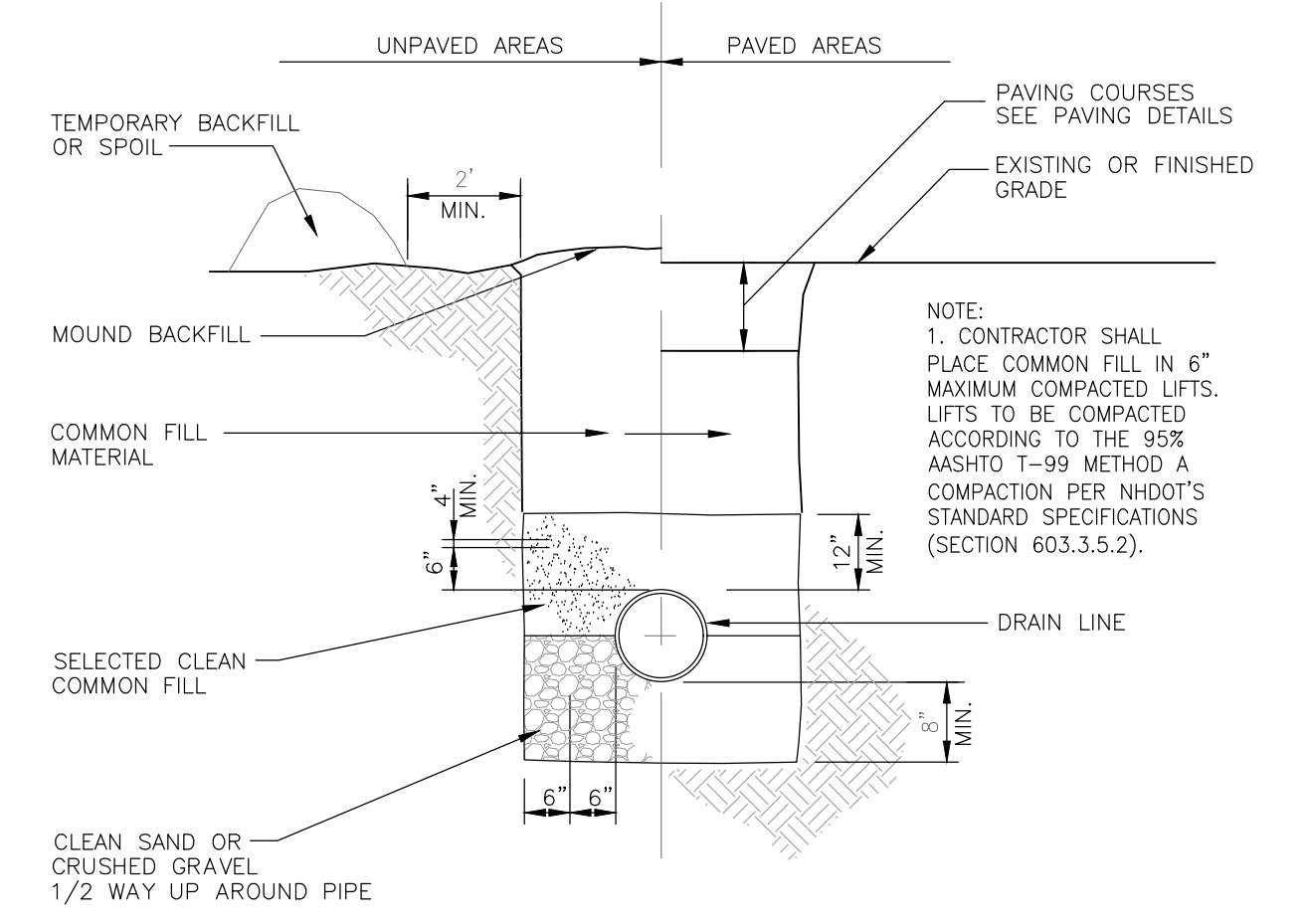
### DRAIN MANHOLE

CONCENTRIC CONE NOT TO SCALE



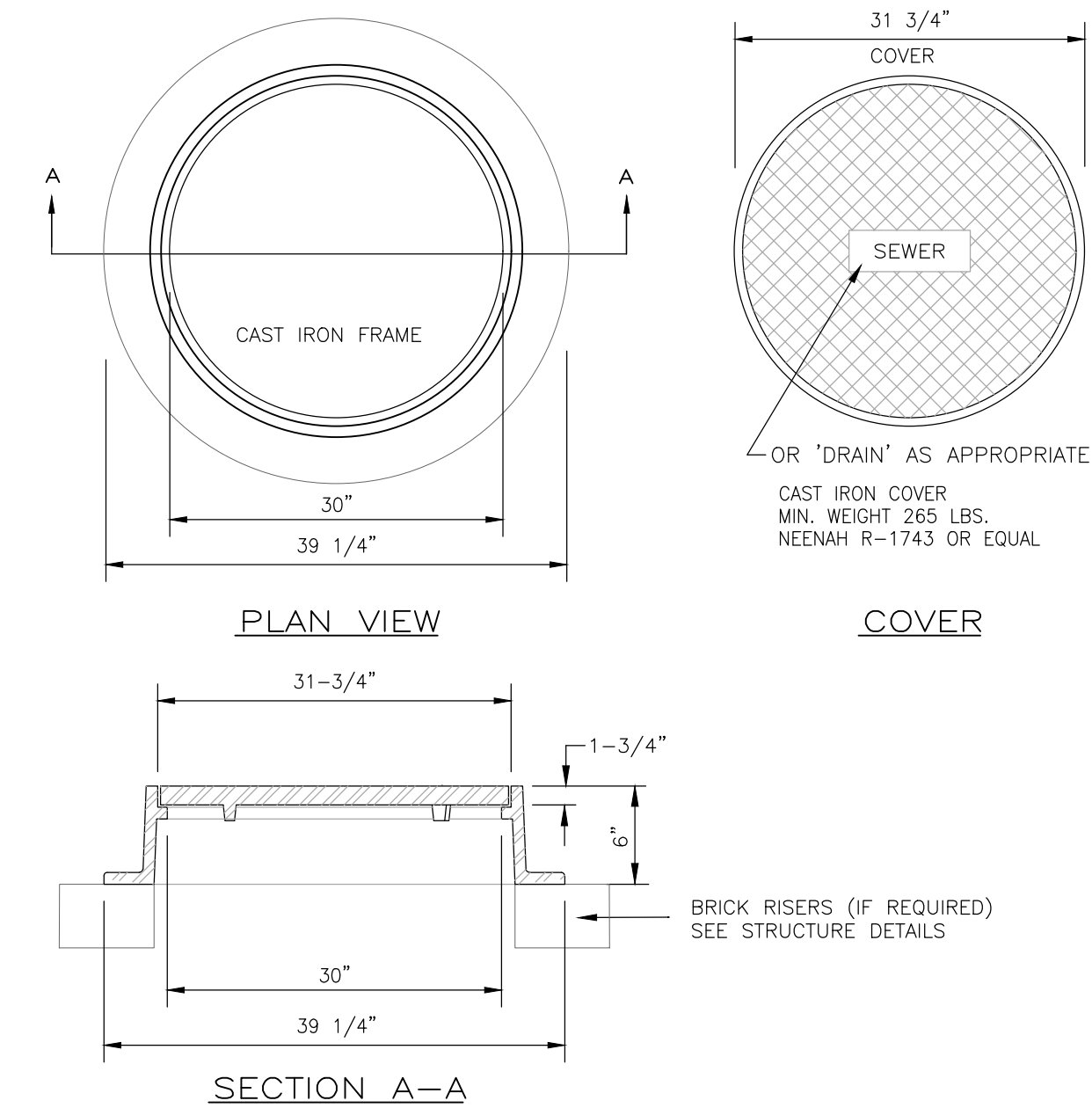
### FRAME AND GRATE

NHDOT TYPE B ALT 1 NOT TO SCALE



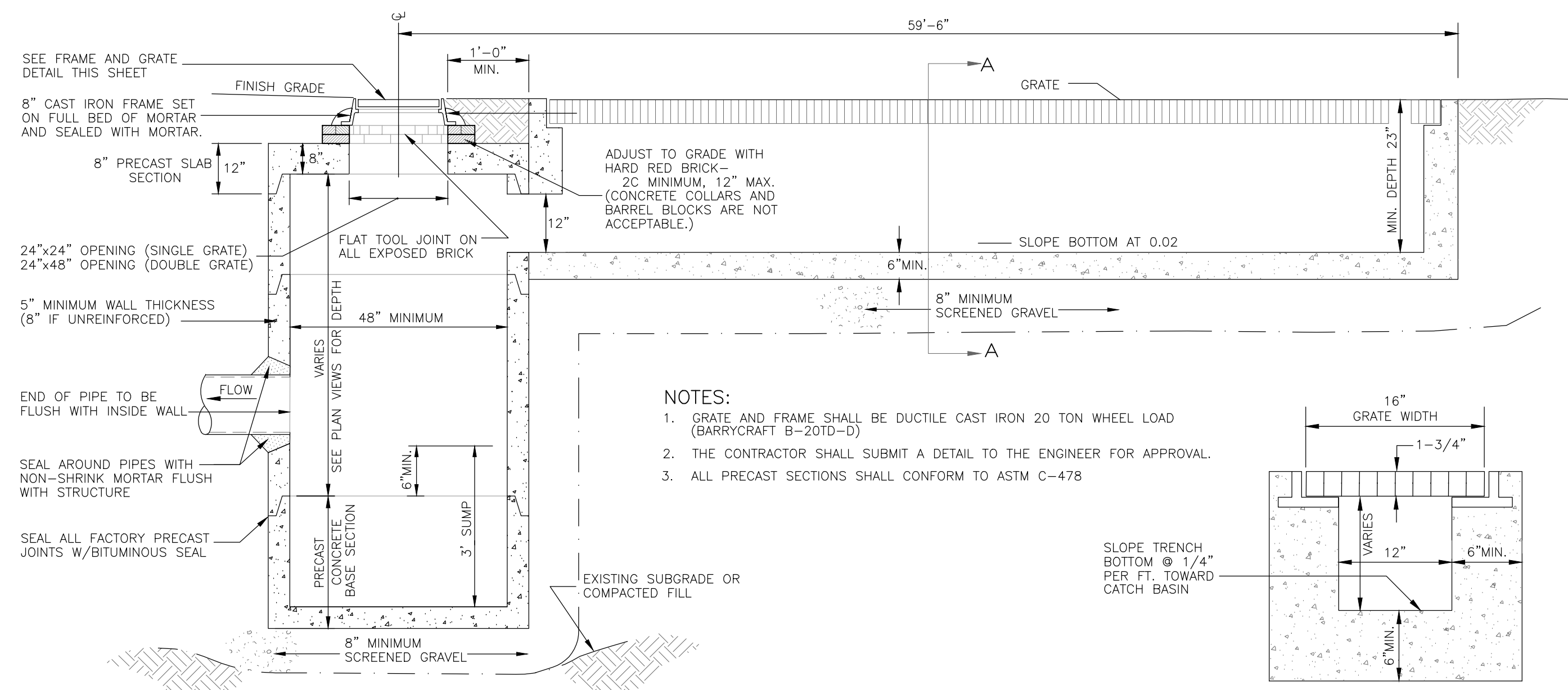
### DRAINAGE LINE TRENCH

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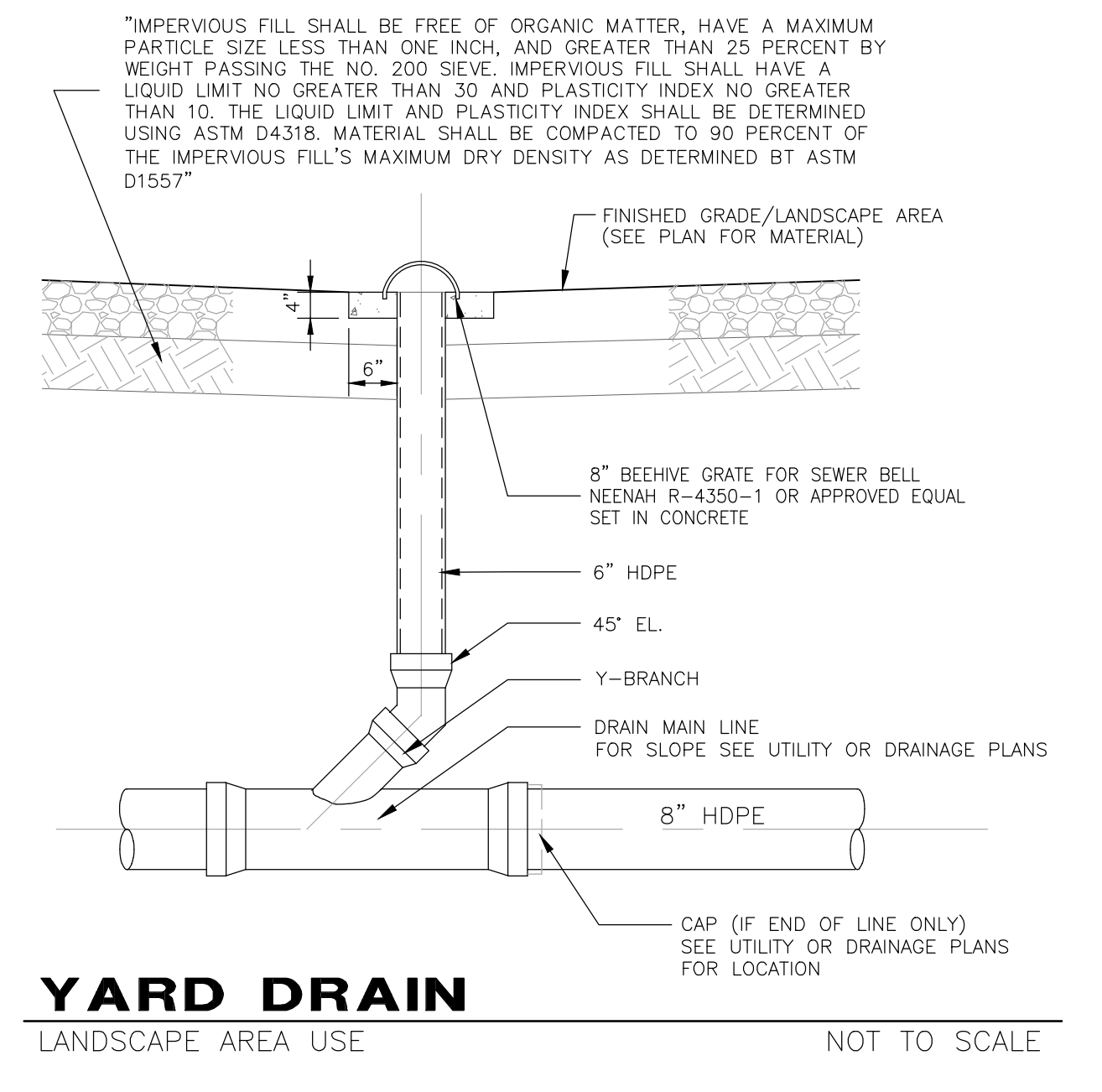
### MANHOLE FRAME & COVER

HEAVY DUTY NOT TO SCALE



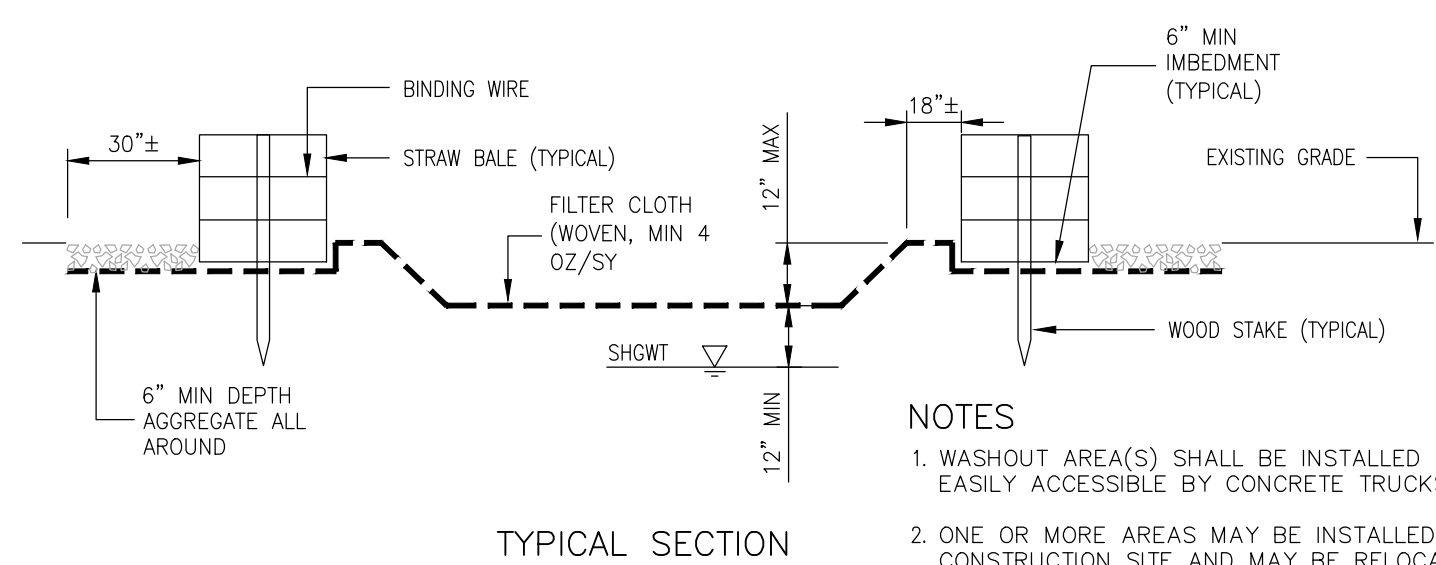
### TRENCH DRAIN

NOT TO SCALE

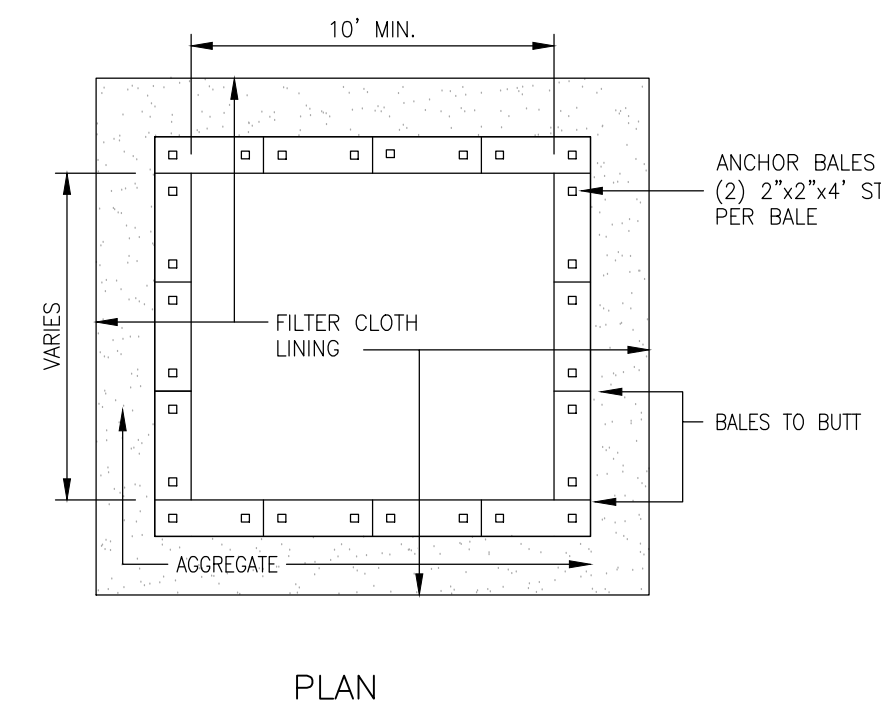


### YARD DRAIN

LANDSCAPE AREA USE NOT TO SCALE

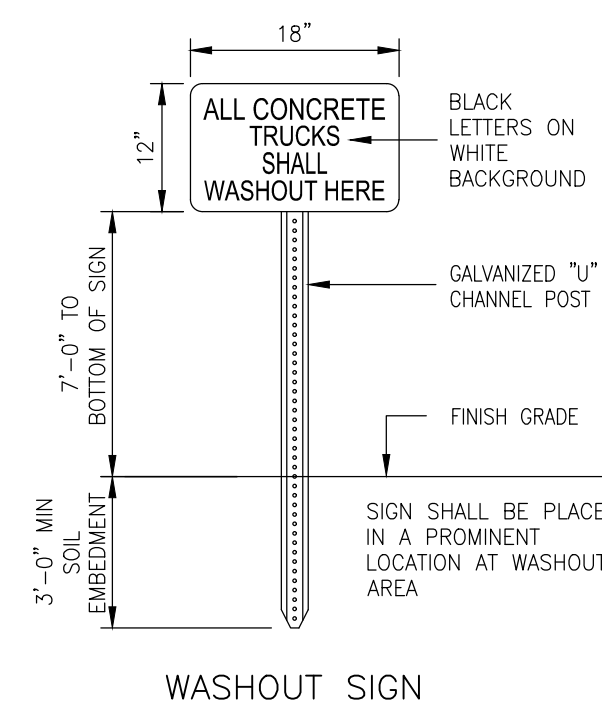


- NOTES:
1. WASHOUT AREA(S) SHALL BE INSTALLED IN A LOCATION EASILY ACCESSIBLE BY CONCRETE TRUCKS.
  2. ONE OR MORE AREAS MAY BE INSTALLED ON THE CONSTRUCTION SITE AND MAY BE RELOCATED AS CONSTRUCTION PROGRESSES.
  3. AT LEAST WEEKLY REMOVE ACCUMULATION OF SAND AND AGGREGATE AND DISPOSE OF PROPERLY.

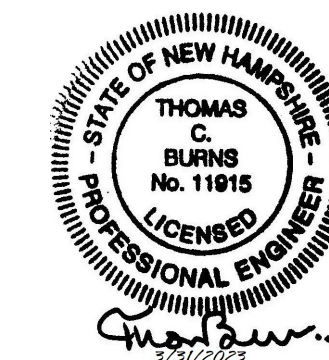


### CONCRETE WASHOUT AREA

NOT TO SCALE



### WASHOUT SIGN



REV	DATE	DESCRIPTION	JD	TCB
1	3/31/2023	REVISED PER EXETER TRC REVIEW	JD	TCB

### SITE DEVELOPMENT PLANS

TAX MAP 52 LOT 112A

#### DETAILS

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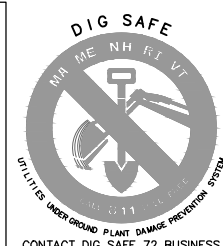
FEBRUARY 28, 2023



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CK TCB CADFILE 45659-51 COVER AND DETAILS C-11

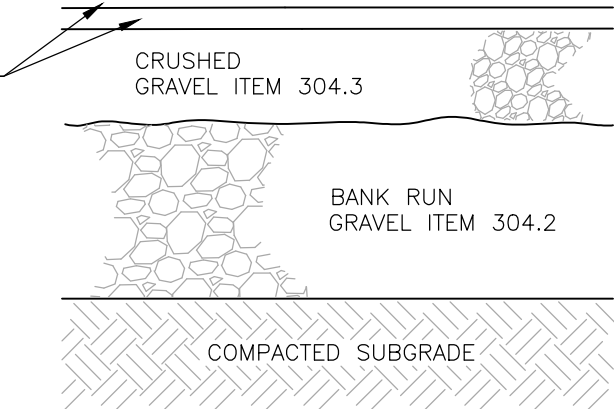


**ROAD CONSTRUCTION NOTES**

1. REMOVE ALL LOAM, CLAY, MUCK, STUMPS, AND OTHER IMPROPER ROAD FOUNDATION MATERIAL WITHIN 2" OF SUBGRADE. REPLACE WITH COMPACTED GRANULAR FILL MATERIAL ACCEPTABLE TO APPROVING AGENCY. COMPACTION TO BE AT LEAST 98% OF STANDARD PROCTOR.
2. ALL ROADWAY CONSTRUCTION MATERIALS AND WORKMANSHIP TO BE IN COMPLIANCE WITH N.H.D.O.T. "STANDARDS FOR ROAD AND BRIDGE CONSTRUCTION" LATEST EDITION.

HOT BITUMINOUS CONCRETE—  
BASE (BINDER) COURSE  
FINISH (WEARING) COURSE  
ITEM 403.11

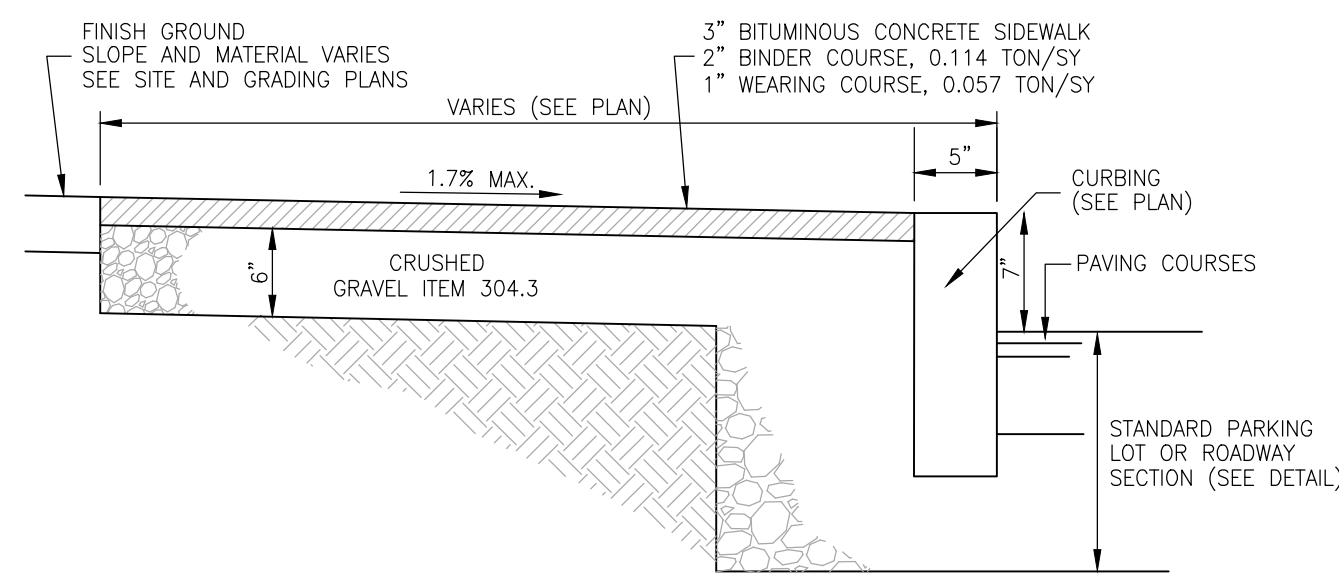
LAYER	PARKING LOTS	ROADS/DRIVES
TOP	1"	1-1/2"
BINDER	2"	2-1/2"
CRUSHED GRAVEL	6"	6"
BANK RUN GRAVEL	8"	8"



**TYPICAL PAVEMENT SECTION**

CLOSED DRAINAGE SYSTEM

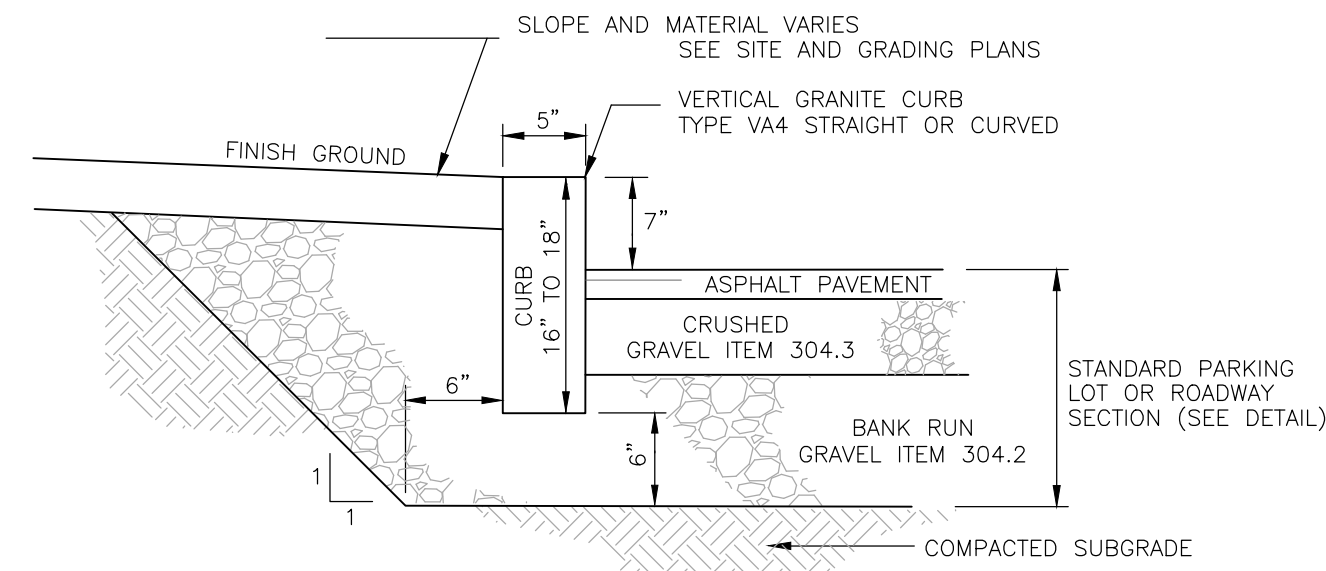
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**BITUMINOUS SIDEWALK**

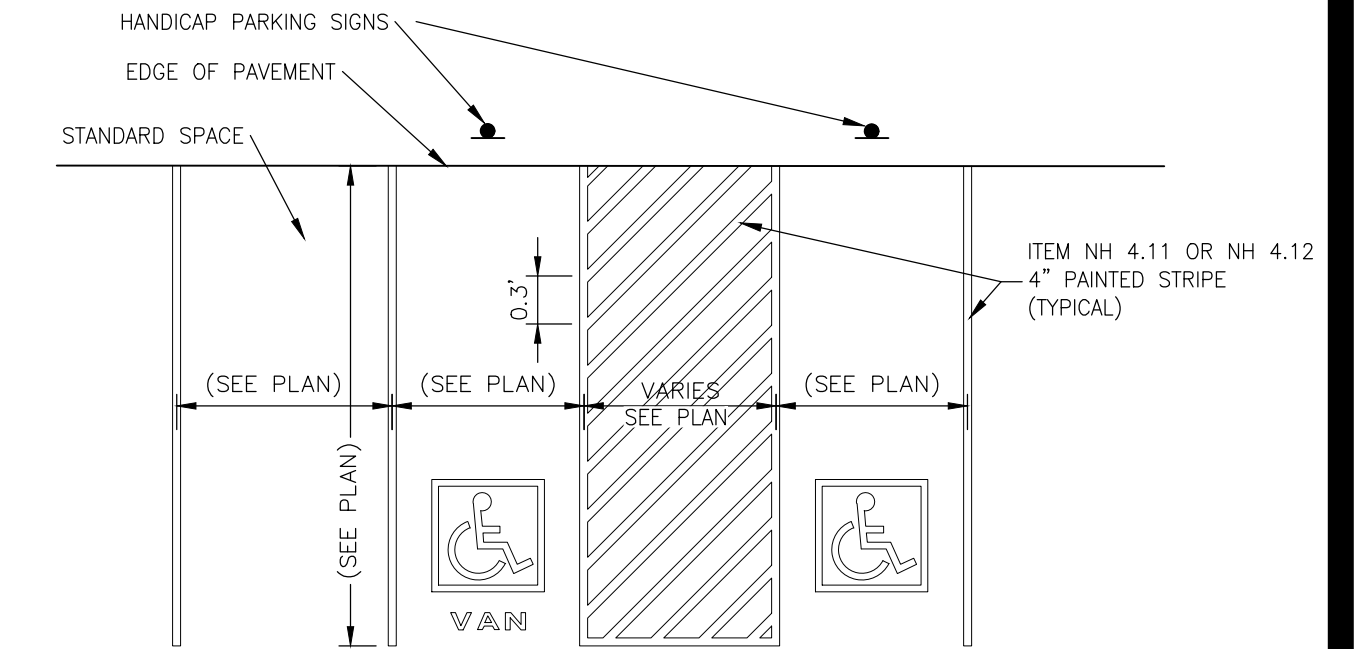
WITH VERTICAL GRANITE CURB

NOT TO SCALE



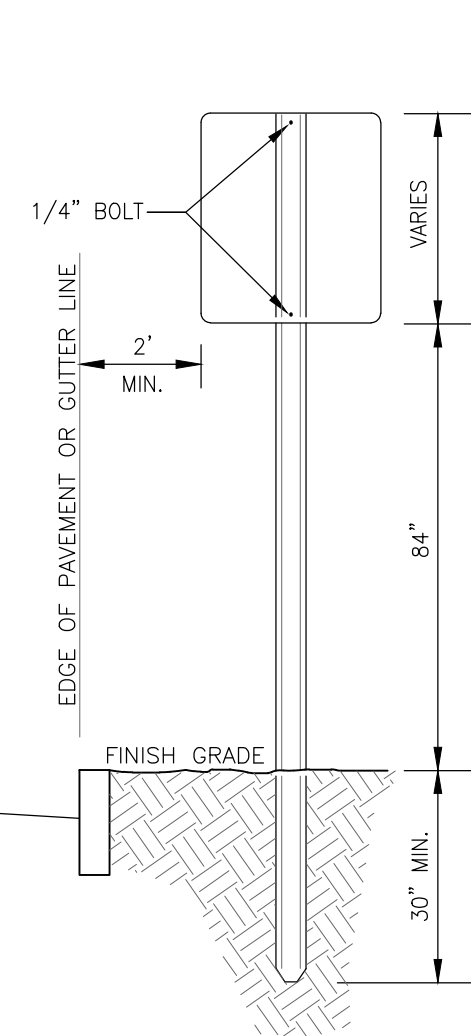
**VERTICAL GRANITE CURB**

NOT TO SCALE



**PARKING STRIPING DETAIL**

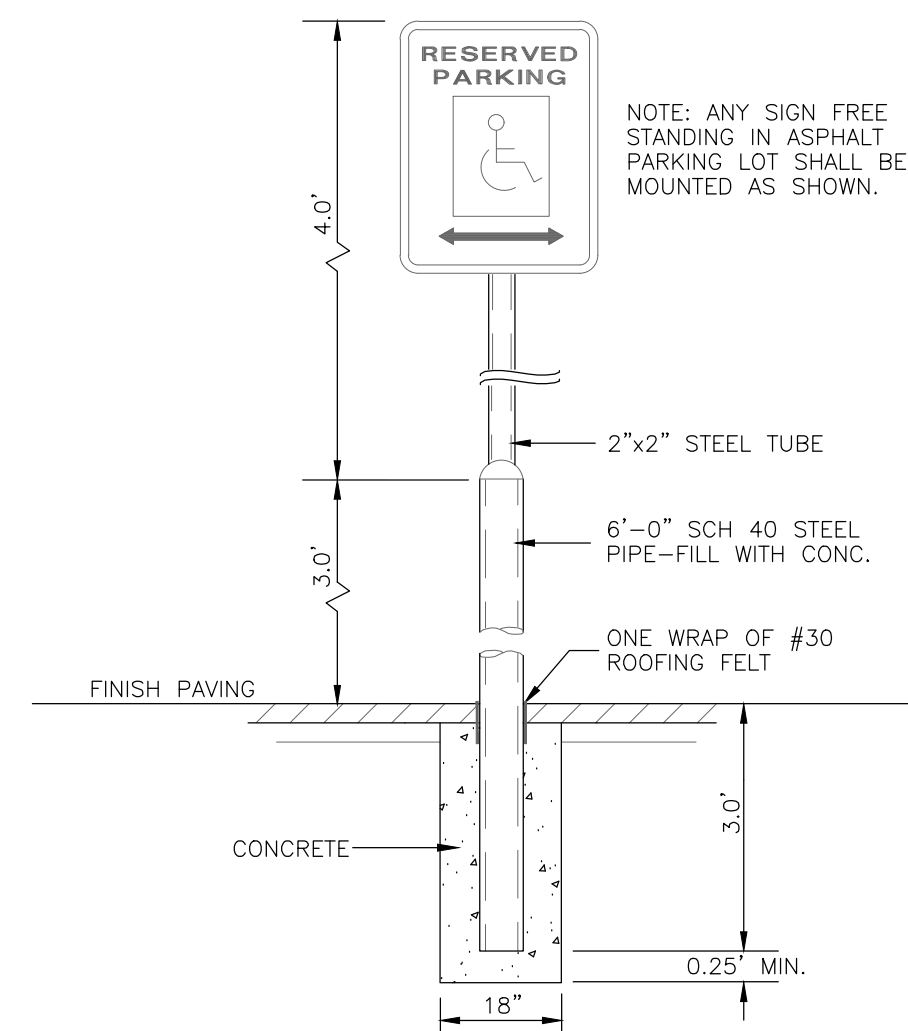
NOT TO SCALE



- POST: SHALL BE 3\"/>
  1. POSTS SHALL BE PLUMB; ANY POST BENT OR OTHERWISE DAMAGED SHALL BE REMOVED AND PROPERLY REPLACED. POSTS MAY BE SET OR DRIVEN.
  2. WHEN POSTS ARE SET, HOLES SHALL BE DUG TO THE PROPER DEPTH. AFTER INSERTING POSTS, THE HOLES SHALL BE BACKFILLED WITH SUITABLE MATERIAL IN LAYERS NO TO EXCEED 6\"/>
  - 3. WHEN POSTS ARE DRIVEN, A SUITABLE DRIVING CAP SHALL BE USED AND AFTER DRIVING THE TOP OF THE POST SHALL HAVE SUBSTANTIALLY THE SAME CROSS-SECTIONAL DIMENSION AS THE BODY OF THE POST; BATTERED HEADS WILL NOT BE ACCEPTED.
  - 4. POSTS SHALL NOT BE DRIVEN WITH THE SIGN ATTACHED TO THE POST.
  - 5. SIGNS SHALL BE ERECTED IN CONFORMANCE WITH THE REQUIREMENTS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
  - 6. WHEN SIGN IS IN PLACE NO PART OF POST SHALL EXTEND ABOVE THE SIGN.
  - 7. DIMENSIONS SHOWN ARE NOMINAL.
  - 8. ALTERNATE SECTIONS MUST BE APPROVED PRIOR TO USE.

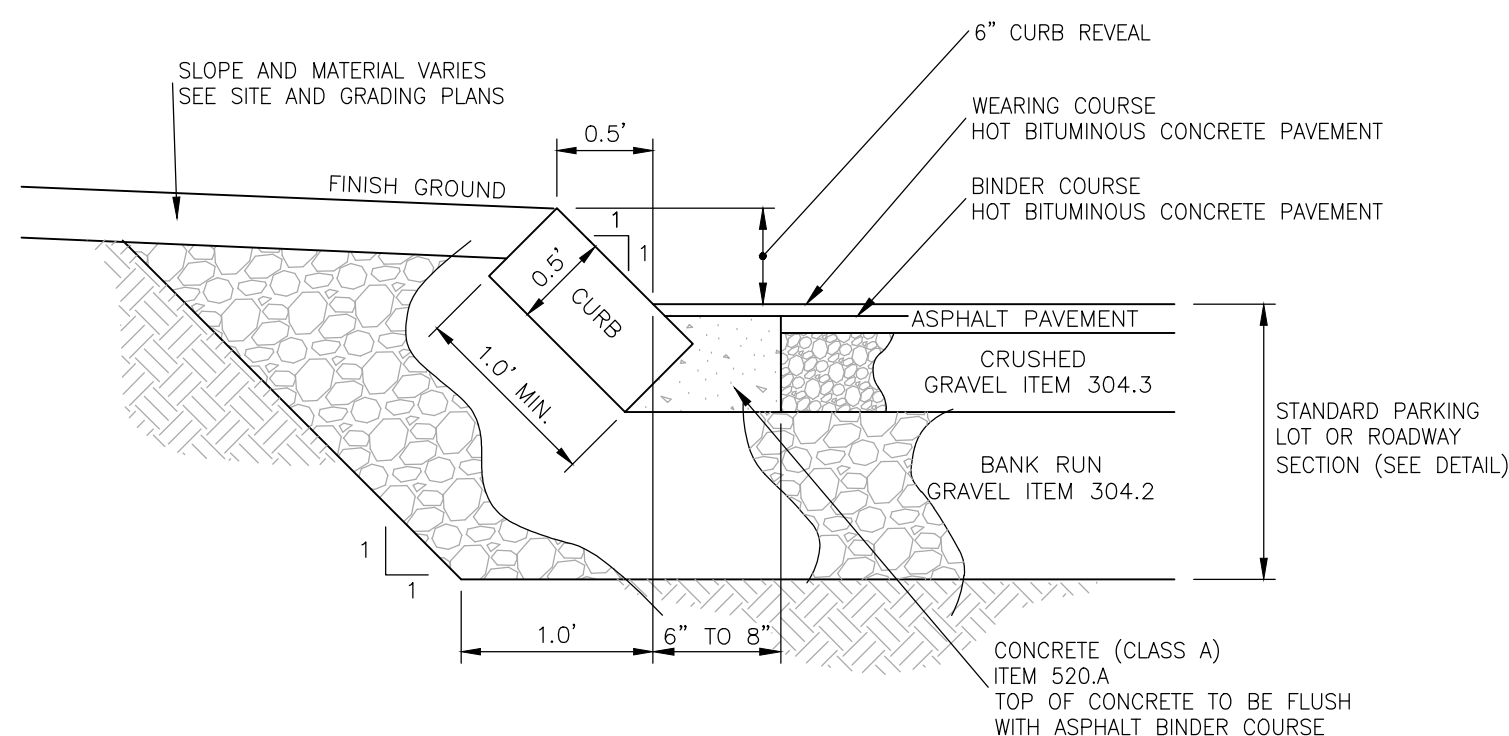
**TRAFFIC SIGN POST IN GRADE**

NOT TO SCALE



**SIGN POLE IN PAVEMENT**

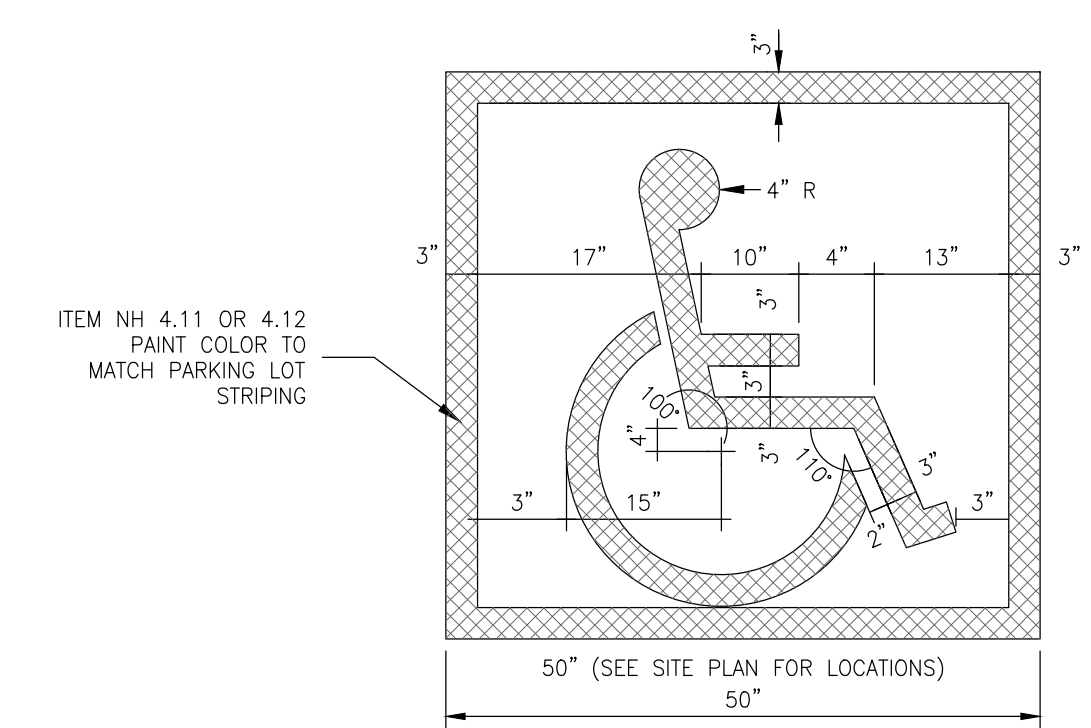
NOT TO SCALE



**SLOPED GRANITE CURB**

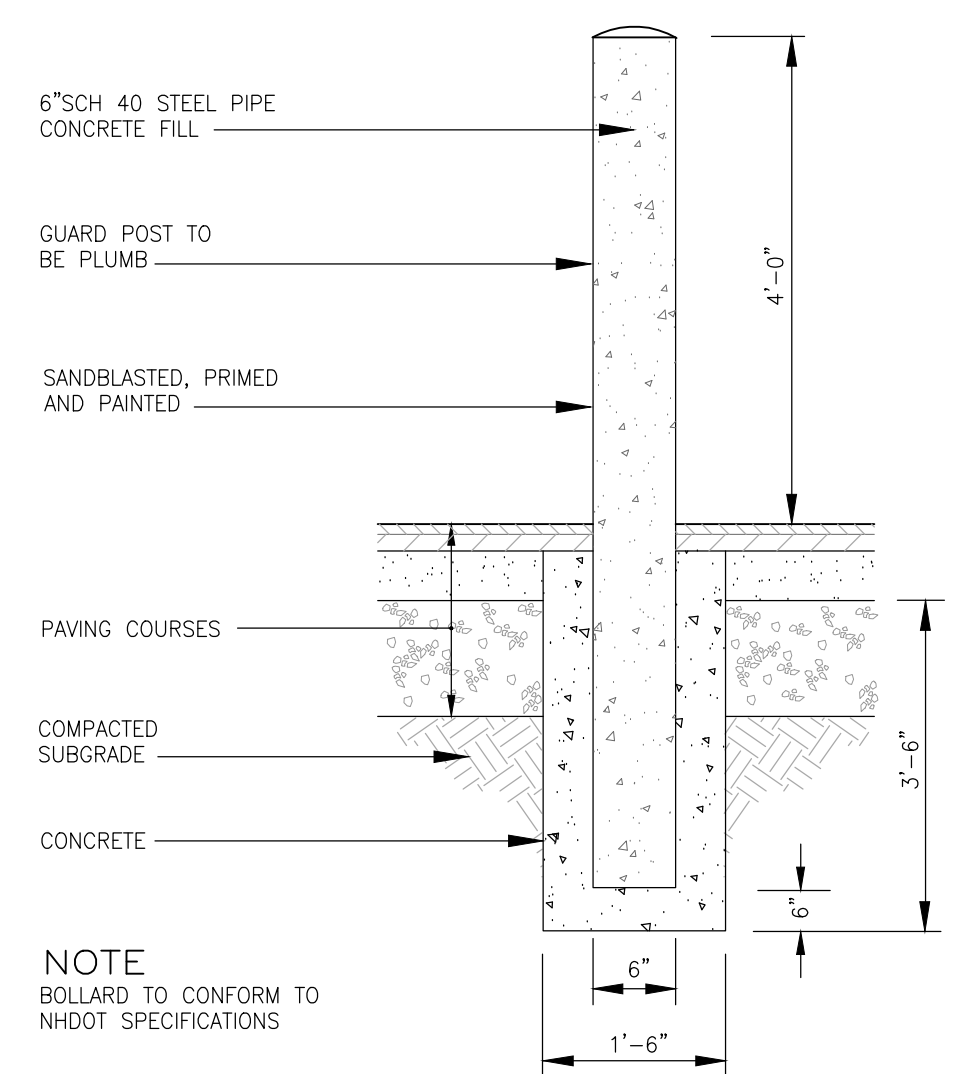
EMBEDDED IN CONCRETE

NOT TO SCALE



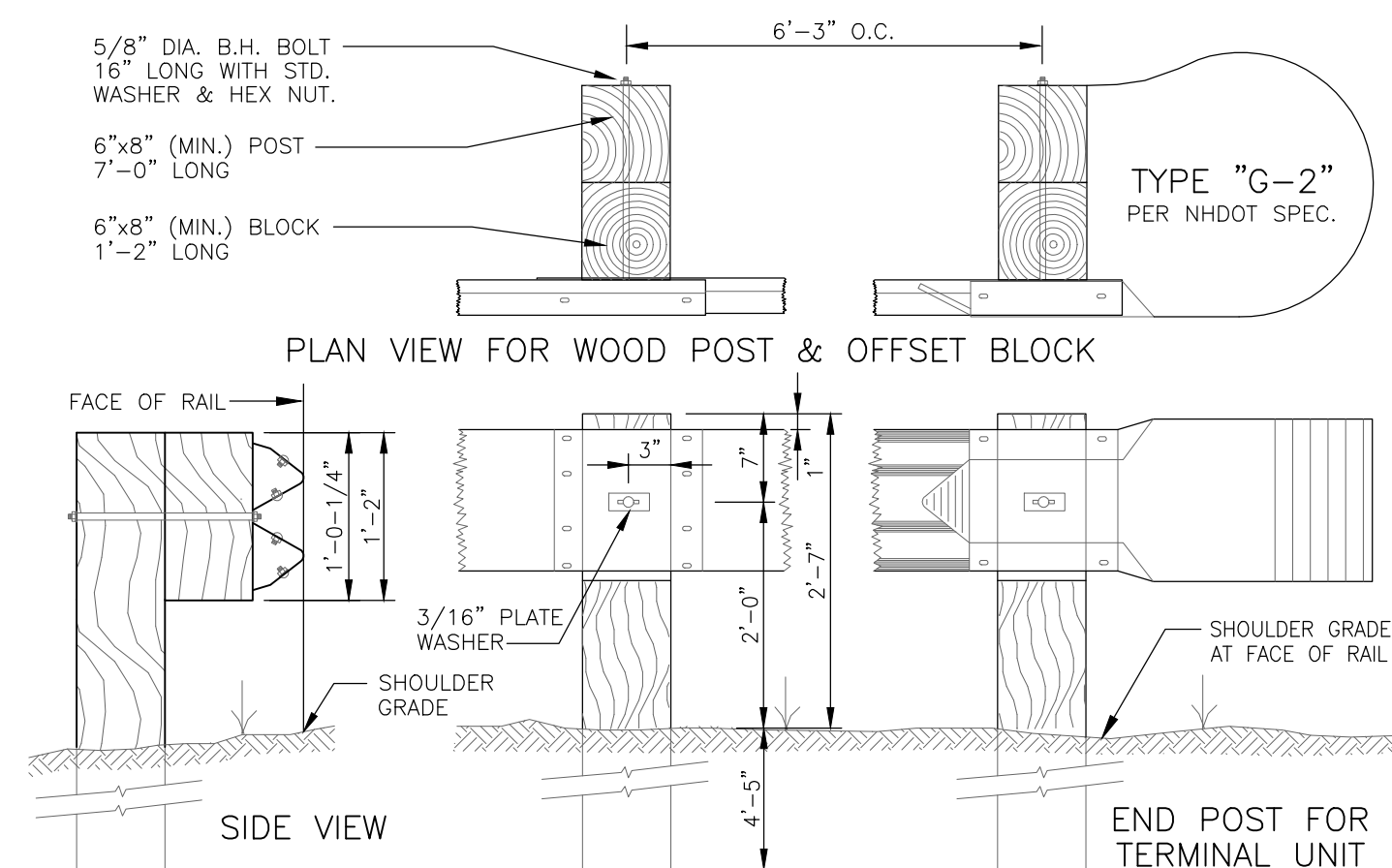
**PAINTED ACCESSIBLE SYMBOL**

NOT TO SCALE



**BOLLARD**

NOT TO SCALE

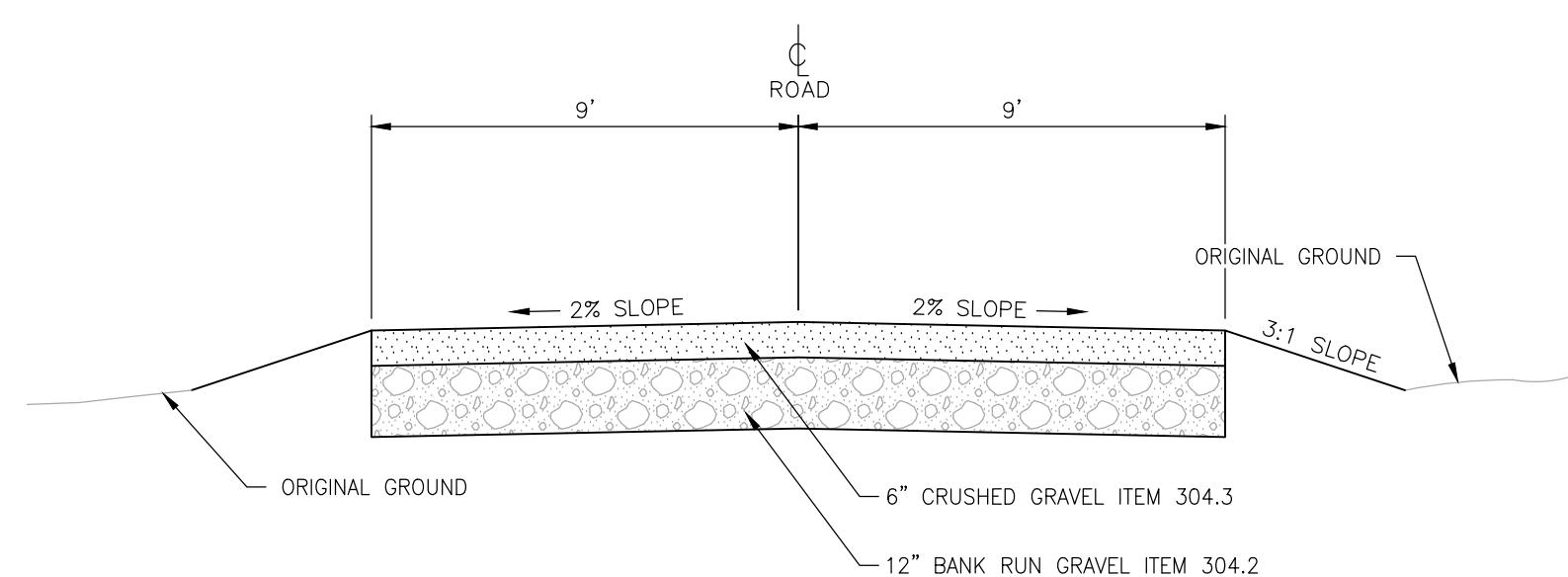


**GENERAL NOTES**

1. POSTS AND OFFSET BLOCKS TO BE PRESSURE TREATED WOOD. ANCHORS, PLATES AND ALL FITTINGS TO BE GALVANIZED.
2. ALL DIMENSIONS SUBJECT TO MANUFACTURERS TOLERANCES.
3. RAIL PANELS AND END SECTIONS TO BE 12 GAUGE STEEL.
4. ALL PARTS SHALL CONFORM TO STANDARD NO. GR-1 OF THE N.H.D.O.T. STANDARD PLANS FOR ROAD CONSTRUCTION.
5. WHEN GUARDRAIL IS CONSTRUCTED AT UP TO FOUR FEET FROM EDGE OF PAVEMENT, THE GUARD RAIL HEIGHT WILL BE SET FROM THE GRADE AT THE EDGE OF PAVEMENT.
6. WHEN THE GUARDRAIL IS CONSTRUCTED MORE THAN FOUR FEET FROM THE EDGE OF PAVEMENT, THE GUARDRAIL WILL BE SET FROM THE GRADE AT FACE OF RAIL.

**"W" BEAM METAL GUARDRAIL**

NOT TO SCALE



**GRAVEL FIRE ACCESS ROAD**

NOT TO SCALE

**SITE DEVELOPMENT PLANS**

TAX MAP 52 LOT 112A  
**DETAILS**  
**C/A DESIGN, INC.**  
**131 PORTSMOUTH AVE. EXETER NH**  
 OWNED BY  
**NH EXETER PROPERTIES, LLC**  
 PREPARED FOR  
**C/A DESIGN, INC.**

SCALE: NTS

FEBRUARY 28, 2023

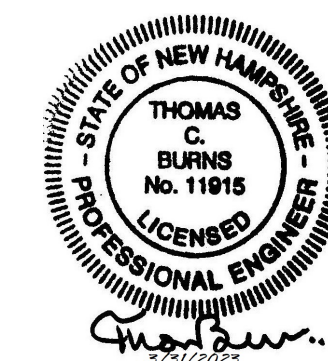
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Mar 31, 2023 - 11:40am \\TFM-BEDFORDA\Projects\Civil-Survey\TFM Projects\45659\Wakefield Thermal - Site Plan\45659-51 Cover and Details.dwg



REV	DATE	DESCRIPTION	JD	TCB
1	3/31/2023	REVISED PER EXETER TRC REVIEW	JD	TCB

FILE	45659-51	DR	JED	FB	-	48 Constitution Drive Bedford, NH 03110 Phone (603) 472-4488 Fax (603) 472-9747 www.tfmoran.com
CK	TCB	CADFILE	45659-51 COVER AND DETAILS			C-12



# SEWER SERVICE NOTES

- MINIMUM SIZE PIPE FOR SEWER SERVICE SHALL BE FOUR INCHES.
  - PIPE AND JOINT MATERIALS:
    - PLASTIC SEWER PIPE
      - PIPE AND FITTINGS SHALL CONFORM TO THE FOLLOWING ASTM STANDARDS:
 

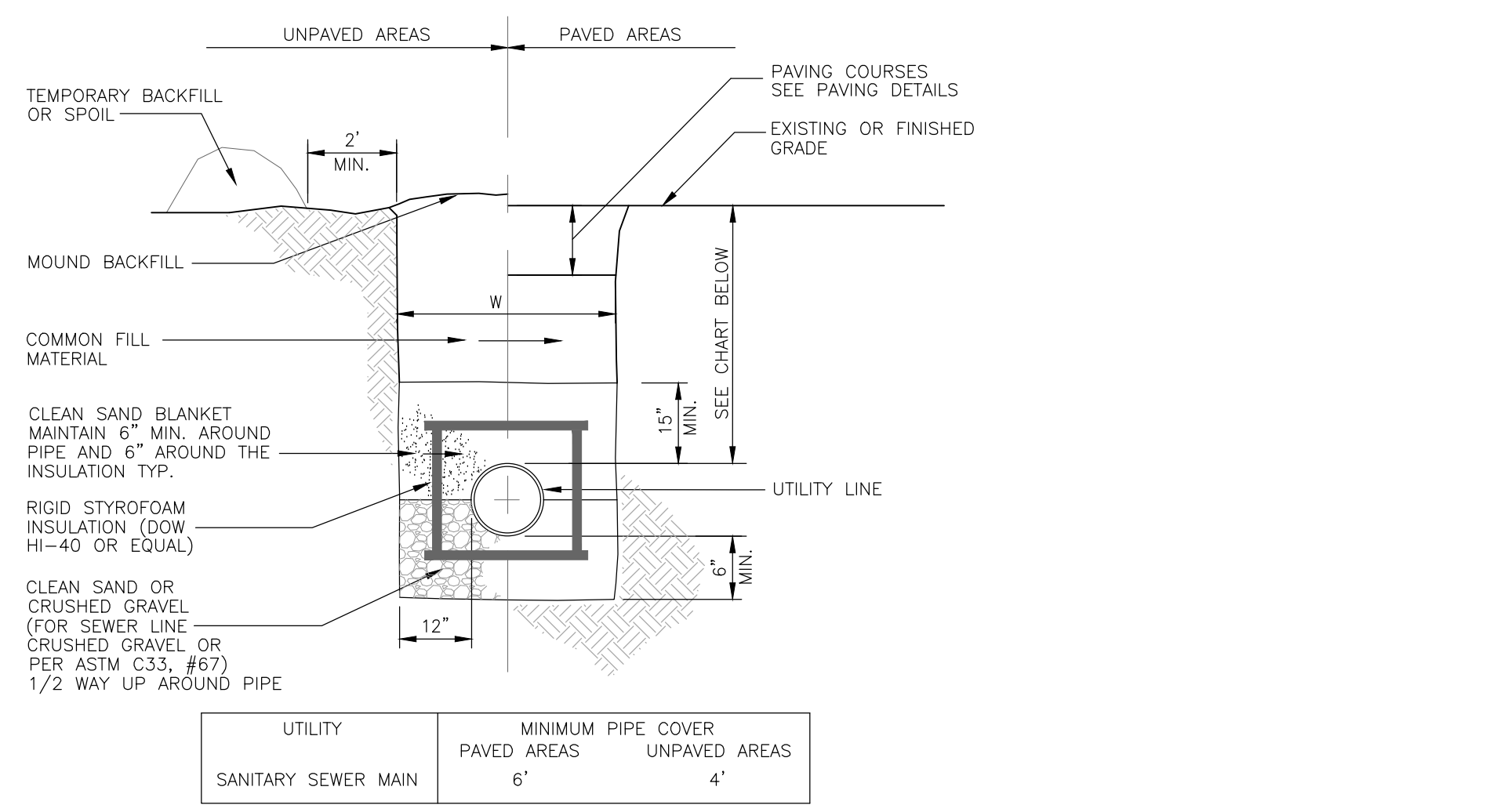
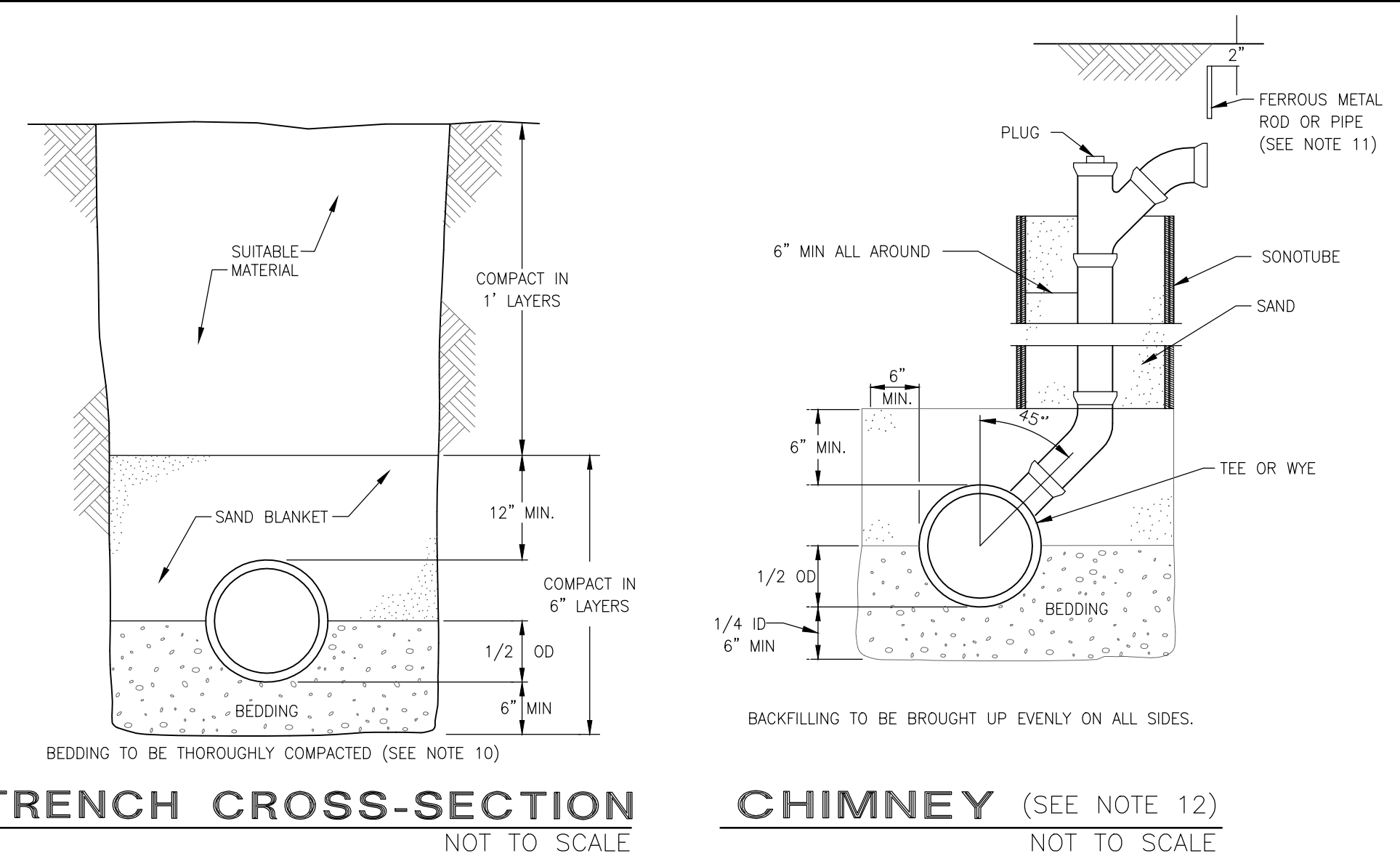
ASTM STANDARDS	GENERIC PIPE MATERIAL	SIZES APPROVED
D3034	*PVC (SOLID WALL)	8" THROUGH 15" (SDR 35)
F679	PVC (SOLID WALL)	18" THROUGH 27" (T-1 & T-2)
F789	PVC (SOLID WALL)	4" THROUGH 18" (T-1 & T-3)
F794	PVC (RIBBED WALL)	8" THROUGH 36"
D2680	*ABS (COMPOSITES WALL)	8" THROUGH 15"

\*PVC: POLY VINYL CHLORIDE  
\*ABS: ACRYLONITRILE-BUTADIENE-STYRENE
    - JOINTS SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL CONFORMING TO ASTM D-3212 AND SHALL BE PUSH-ON, BELL AND SPIGOT TYPE.  
ABS TRUSS PIPE AND FITTINGS SHALL CONFORM TO ASTM D-2680, POLYMER COMPOUNDING SHALL BE TO ASTM D-1788 (CLASS 322).  
JOINTS FOR ABS TRUSS PIPE SHALL BE CHEMICAL WELDED COUPLINGS TYPE SC IN ACCORDANCE WITH ASTM D-2680, FORMING A CHEMICAL WELDED JOINT.
  - DUCTILE-IRON PIPE, FITTINGS AND JOINTS.
    - DUCTILE IRON PIPE AND FITTINGS SHALL CONFORM TO THE FOLLOWING STANDARDS OF THE UNITED STATES OF AMERICA STANDARDS INSTITUTE:
      - A21.50 THICKNESS DESIGN OF DUCTILE IRON PIPE AND WITH ASTM A-536 DUCTILE IRON CASTINGS.
      - A21.51 DUCTILE IRON PIPE, CENTRIFUGALLY CAST IN METAL MOLDS OR SAND-LINED MOLDS FOR WATER OR OTHER LIQUIDS.
    - JOINTS SHALL BE OF THE MECHANICAL OR PUSH-ON TYPE. JOINTS AND GASKETS SHALL CONFORM TO:
      - A21.11 RUBBER GASKETS JOINTS FOR CAST IRON PRESSURE PIPE & FITTINGS
- DAMAGED PIPE SHALL BE REJECTED AND REMOVED FROM THE JOB SITE.
- JOINTS SHALL BE DEPENDENT UPON A NEOPRENE OR ELASTOMERIC GASKET FOR WATER-TIGHTNESS. ALL JOINTS SHALL BE PROPERLY MATCHED WITH THE PIPE MATERIALS USED, WHERE DIFFERING MATERIALS ARE TO BE CONNECTED, AS AT THE STREET SEWER WYE OR AT THE FOUNDATION WALL, APPROPRIATE MANUFACTURED ADAPTERS SHALL BE USED.
- TEES AND WYES: WHERE A TEE OR WYE IS NOT AVAILABLE IN THE EXISTING STREET SEWER, AN APPROPRIATE CONNECTION SHALL BE MADE, FOLLOWING MANUFACTURERS' INSTRUCTIONS USING A BOLTED, CLAMPED OR EPOXY-CLAMPED SADDLE TAPPED INTO A SMOOTHLY DRILLED OR SAWN OPENING IN THE SEWER. THE PRACTICE OF BREAKING AN OPENING WITH A SLEDGE HAMMER, STUFFING CLOTH OR OTHER SUCH MATERIAL AROUND THE JOINT, OR APPLYING MORTAR TO HOLD THE CONNECTION, AND ANY OTHER SIMILAR CRUDE PRACTICES OR INEPT OR HASTY IMPROVISATIONS WILL NOT BE PERMITTED. THE CONNECTION SHALL BE CONCRETE ENCASED AS SHOWN IN THE DETAIL UP TO AND INCLUDING 15" DIAMETER.
- SEWER SERVICE INSTALLATION: THE PIPE SHALL BE HANDLED, PLACED AND JOINTED IN ACCORDANCE WITH INSTALLATION GUIDES OF THE APPROPRIATE MANUFACTURER. IT SHALL BE CAREFULLY BEDDED ON A 6 INCH LAYER OF CRUSHED STONE AND/OR GRAVEL AS SPECIFIED IN NOTE 10. BEDDING AND RE-TILE FOR DEPTH OF 12 INCHES ABOVE THE TOP OF THE PIPE SHALL BE CAREFULLY AND THOROUGHLY TAMPED BY HAND OR WITH APPROPRIATE MECHANICAL DEVICES.  
THE PIPE SHALL BE LAID AT A CONTINUOUS AND CONSTANT GRADE FROM THE STREET SEWER CONNECTION TO THE FOUNDATION AT A NOT LESS THAN 1/4" INCH PER FOOT. PIPE JOINTS MUST BE MADE UNDER DRY CONDITIONS. IF WATER IS PRESENT, ALL NECESSARY STEPS SHALL BE TAKEN TO DEWATER THE TRENCH.
- TESTING: THE COMPLETED SEWER SERVICE SHALL BE SUBJECTED TO A THIRD PARTY LEAKAGE TEST IN ANY OF THE FOLLOWING MANNERS: (PRIOR TO BACKFILLING)
  - AN OBSERVATION TEE SHALL BE INSTALLED AS SHOWN AND WHEN READY FOR TESTING, AN INFLATABLE BLADDER OR PLUG SHALL BE INSERTED JUST UPSTREAM FROM THE OPENING IN THE TEE. AFTER INFLATION, WATER SHALL BE INTRODUCED INTO THE SYSTEM ABOVE THE PLUG TO A HEIGHT OF 5 FEET ABOVE THE LEVEL OF THE PLUG.
  - THE PIPE SHALL BE LEFT EXPOSED AND LIBERALLY HOSED WITH WATER, TO SIMULATE, AS NEARLY AS POSSIBLE, WET TRENCH CONDITIONS OR, IF TRENCH IS WET, THE GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE. INSPECTIONS FOR LEAKS SHALL BE MADE THROUGH THE CLEANOUT WITH A FLASHLIGHT.
  - DRY FLUORESCENCE DYE SHALL BE SPRINKLED INTO THE TRENCH OVER THE PIPE. IF THE TRENCH IS DRY, THE PIPE SHALL BE LIBERALLY HOSED WITH WATER. OR IF THE TRENCH IS WET, GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE. OBSERVATION FOR LEAKS SHALL BE MADE IN THE FIRST DOWN-STREAM MANHOLE.

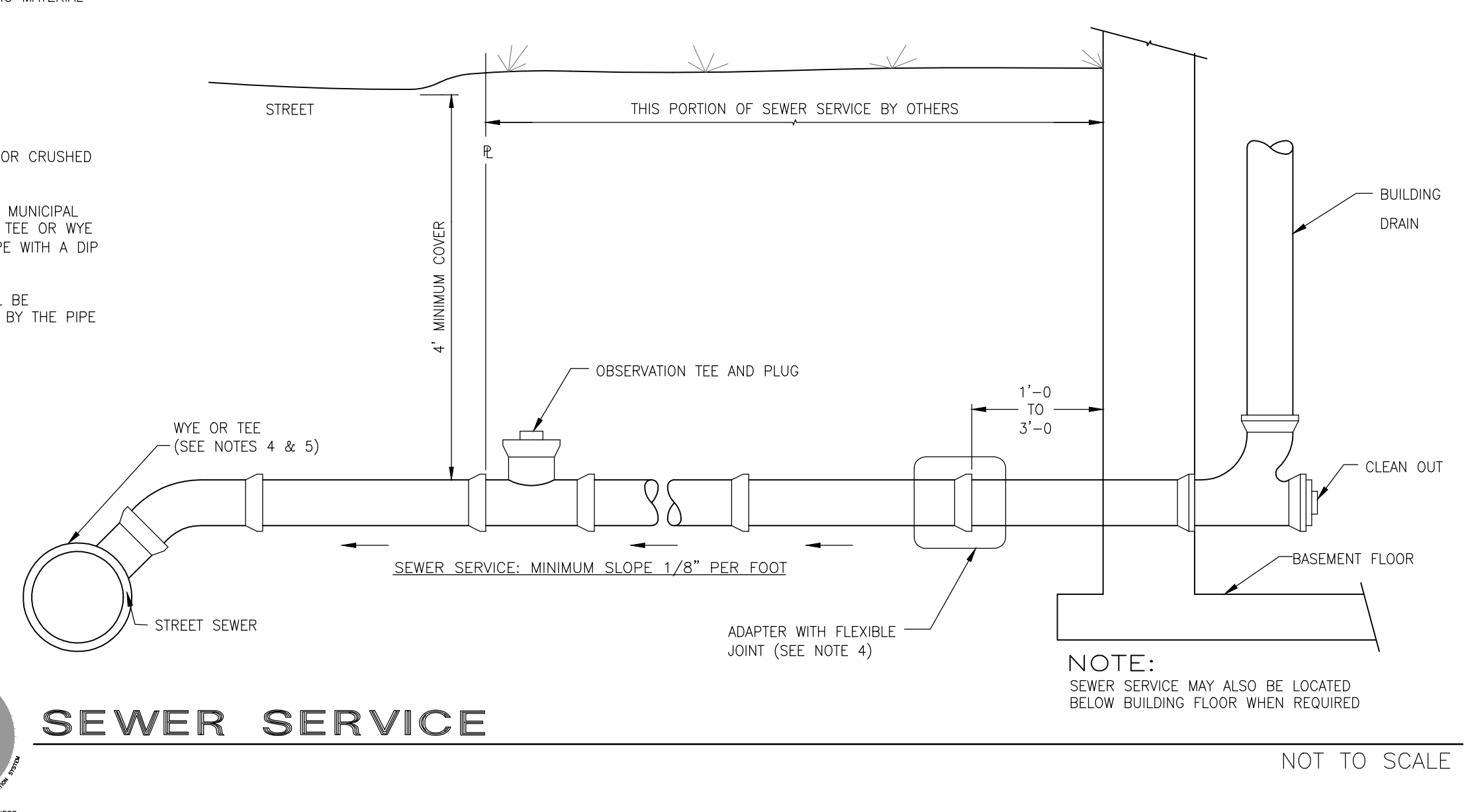
LEAKAGE OBSERVED IN ANY ONE OF THE ABOVE ALTERNATE TESTS SHALL BE CAUSE FOR NON-ACCEPTANCE AND THE PIPE SHALL BE DUG-UP IF NECESSARY AND RE-LAID SO AS TO ASSURE WATER TIGHTNESS.
- ILLEGAL CONNECTIONS: NOTHING BUT SANITARY WASTE FLOW FROM TOILETS, SINKS, LAUNDRY ETC. SHALL BE PERMITTED. ROOF LEADERS, FOOTING DRAINS, SUMP PUMPS OR OTHER SIMILAR CONNECTIONS CARRYING RAIN WATER, DRAINAGE OR GROUND WATER SHALL NOT BE PERMITTED.
- WATER SERVICE SHALL NOT BE LAID IN SAME TRENCH AS SEWER SERVICE.
- BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATERIAL AND MEETING ASTM C33-67.
 

100% PASSING	1 INCH SCREEN
90%-100% PASSING	3/4 INCH SCREEN
20%-55% PASSING	3/8 INCH SCREEN
0%-10% PASSING	#4 SIEVE
0%-5% PASSING	#8 SIEVE

WHERE ORDERED BY THE ENGINEER TO STABILIZE THE TRENCH BASE, SCREENED GRAVEL OR CRUSHED STONE 1/2 INCH TO 1 1/2 INCH SHALL BE USED.
- LOCATION: THE LOCATION OF THE TEE OR WYE SHALL BE RECORDED AND FILED IN THE MUNICIPAL RECORDS. IN ADDITION, A FERROUS METAL ROD OR PIPE SHALL BE PLACED OVER THE TEE OR WYE AS DESCRIBED IN THE TYPICAL "CHIMNEY" DETAIL, TO AID IN LOCATING THE BURIED PIPE WITH A DIP NEEDLE OR PIPEFINDER.
- CHIMNEYS: IF VERTICAL DROP INTO SEWER IS GREATER THAN 4 FEET, A CHIMNEY SHALL BE CONSTRUCTED FOR THE SEWER CONNECTION. CHIMNEY INSTALLATION AS RECOMMENDED BY THE PIPE MANUFACTURER MAY BE USED IF APPROVED BY THE ENGINEER.



**NOTE:**  
W=MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES; FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE O.D. W SHALL ALSO BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.



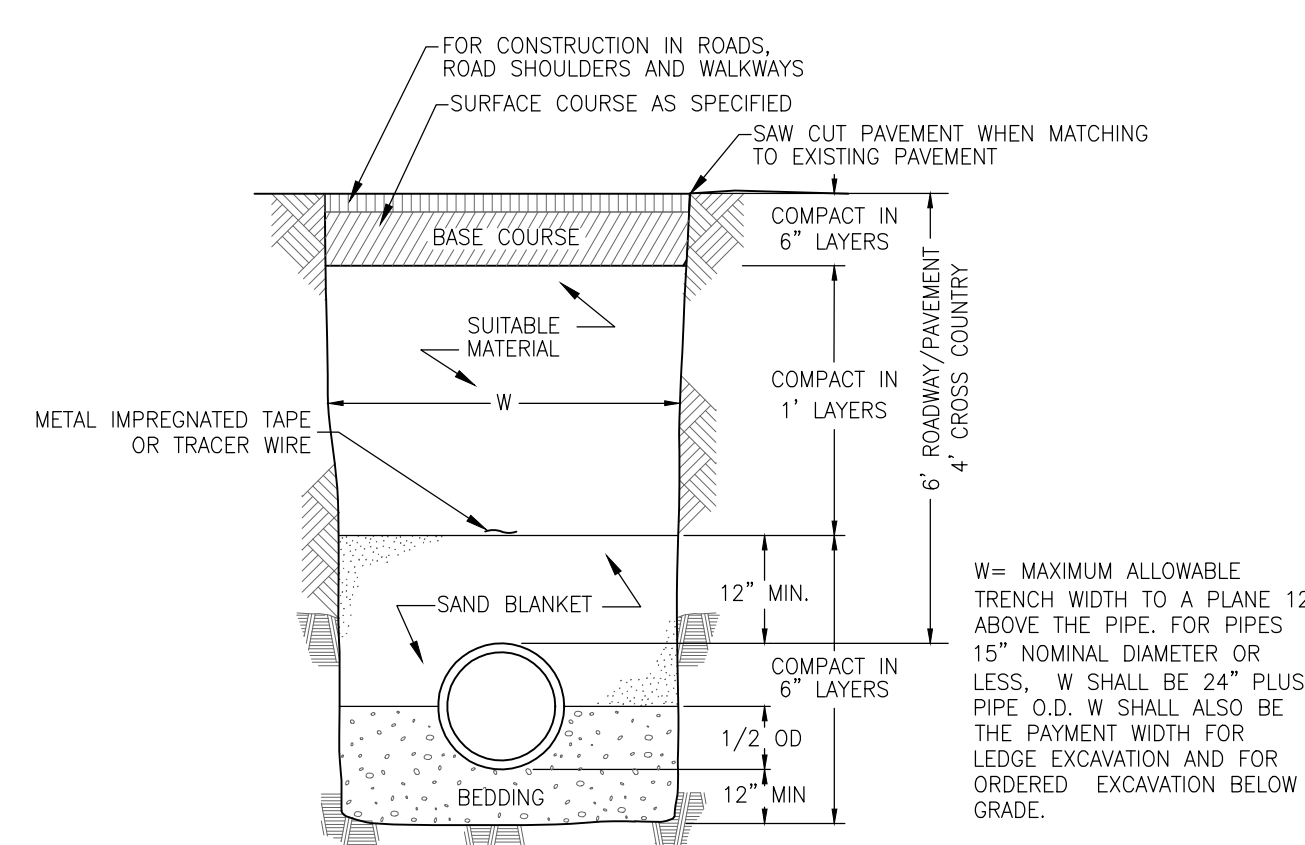
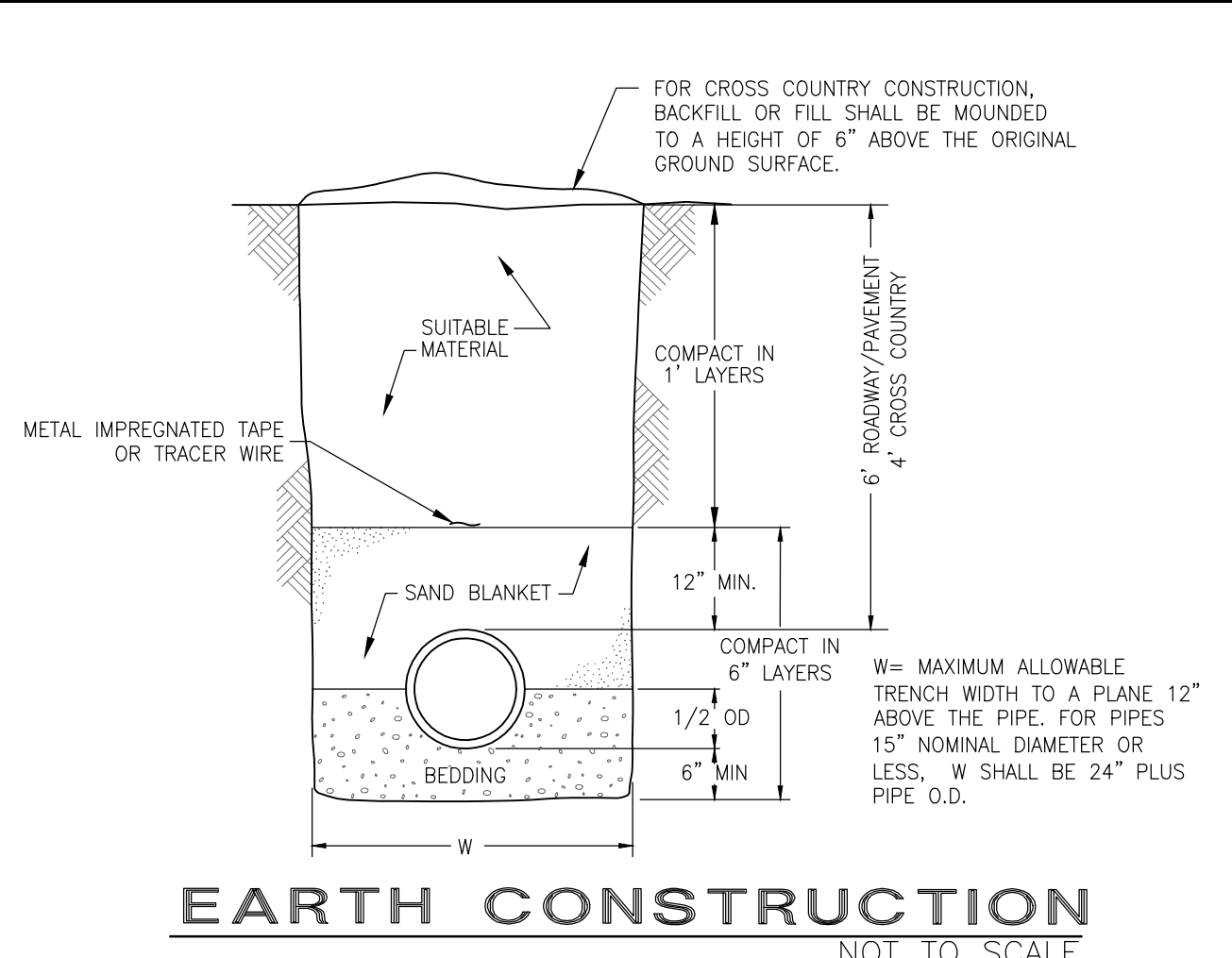
# GRAVITY SEWER NOTES

- MINIMUM SIZE PIPE FOR GRAVITY SEWER SHALL BE 8-INCHES.
- PIPE AND JOINT MATERIALS FOR PLASTIC SEWER PIPE SHALL CONFORM TO THE FOLLOWING ASTM STANDARDS:
 

ASTM STANDARDS	GENERIC PIPE MATERIAL	SIZES APPROVED
D3034-04a	*PVC (SOLID WALL)	8" THROUGH 15" (SDR 35)
F679-03	PVC (SOLID WALL)	18" THROUGH 27" (T-1 & T-2)
F794-03	PVC (RIBBED WALL)	8" THROUGH 36"
F1760-01(2005)e1	PVC, RECYCLED	ALL DIAMETERS

\*PVC: POLY VINYL CHLORIDE
- PLASTIC SEWER PIPE SHALL HAVE A PIPE STIFFNESS RATING OF AT LEAST 46 POUNDS PER SQUARE INCH AT 5 PERCENT PIPE DIAMETER DEFLECTION, AS MEASURED IN ACCORDANCE WITH ASTM D2412-02 DURING MANUFACTURE.
- JOINTS SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL CONFORMING TO ASTM D-3212-96(a)(2003)e1 AND SHALL BE PUSH-ON, BELL AND SPIGOT TYPE.
- DUCTILE-IRON PIPE, FITTINGS AND JOINTS SHALL CONFORM TO THE FOLLOWING STANDARDS OF THE AMERICAN WATER WORKS ASSOCIATION (AWWA).
  - AWWA C151/A21.51-02 THICKNESS DESIGN OF DUCTILE IRON PIPE AND WITH ASTM A-536-84 (2004) DUCTILE IRON CASTINGS.
  - AWWA C151/A21.51-02 DUCTILE IRON PIPE, CENTRIFUGALLY CAST IN METAL MOLDS OR SAND-LINED MOLDS FOR WATER OR OTHER LIQUIDS.

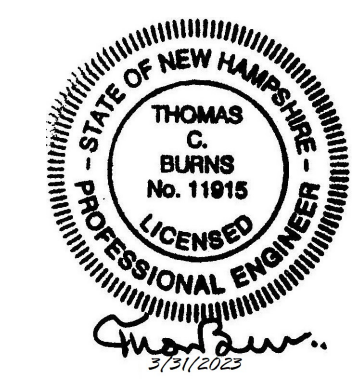
JOINTS SHALL BE OF THE MECHANICAL OR PUSH-ON TYPE. JOINTS AND GASKETS SHALL CONFORM TO AWWA C151/A21.11 RUBBER GASKETS JOINTS FOR CAST IRON PRESSURE PIPE & FITTINGS.
- CONCRETE PIPE SHALL CONFORM TO AWWA C302-04.
- PRESTRESSED CONCRETE CYLINDER PIPE AND FITTINGS SHALL CONFORM TO AWWA C301-99.
- JOINTS SEALS FOR CONCRETE CYLINDER PIPE SHALL BE OIL RESISTANT ELASTOMERIC MATERIAL CONFORMING TO ASWWA C301-99 SPECIFICATIONS.
- DAMAGED PIPE SHALL BE REJECTED AND REMOVED FROM THE JOB SITE.
- GRAVITY SEWER PIPE TESTING SHALL BE AS FOLLOWS:
  - ALL NEW GRAVITY SEWERS SHALL BE TESTED FOR WATER TIGHTNESS BY THE USE OF LOW-PRESSURE AIR TESTS.
  - LOW PRESSURE AIR TESTING SHALL BE IN CONFORMANCE WITH:
    - ASTM F1417-92(2005) "STANDARD TEST METHOD FOR INSTALLATION ACCEPTANCE OF PLASTIC GRAVITY SEWER LINES USING LOW PRESSURE AIR".
    - UNI-BELL PVC PIPE ASSOCIATION UNI-B-6, "LOW PRESSURE AIR TESTING OF INSTALLED SEWER PIPE".
- ALL NEW GRAVITY SEWERS SHALL BE CLEANED AND VISUALLY INSPECTED AND SHALL BE TRUE TO LINE AND GRADE FOLLOWING INSTALLATION AND PRIOR TO USE.
- ALL PLASTIC SEWER PIPE SHALL BE DEFLECTION TESTED NOT LESS THAN 30 DAYS FOLLOWING INSTALLATION.
- THE MAXIMUM ALLOWABLE DEFLECTION OF FLEXIBLE SEWER PIPE SHALL BE 7.5 PERCENT OF THE AVERAGE INSIDE DIAMETER.
- TRENCH CONSTRUCTION SHALL CONFORM TO THE FOLLOWING:
  - SEWERS SHALL BE BURIED TO A MINIMUM DEPTH OF 6' BELOW GRADE IN ALL ROADWAY LOCATIONS AND TO A MINIMUM DEPTH OF 4 FEET BELOW GRADE IN ALL CROSS COUNTRY LOCATIONS.



- WHERE SEWER LINES CROSS WATER PIPES, A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN THE TWO OUTSIDE PIPE WALLS SHALL BE OBSERVED. AT SEWER/WATER INTERSECTIONS, A MINIMUM OF 6 FEET SHALL BE PROVIDED FROM THE WATER LINE TO THE SEWER PIPE JOINT. 12" SEPARATION BETWEEN THE TWO OUTSIDE PIPE WALLS SHALL BE REQUIRED BETWEEN SEWER LINES AND ALL OTHER PIPES.
- TRENCH DIMENSIONS FOR SEWER PIPE LESS THAN 15 INCHES IN DIAMETER, THE ALLOWABLE TRENCH WIDTH AT A PLANE 12 INCHES ABOVE THE PIPE SHALL BE NO MORE THAN 36 INCHES AND FOR PIPE 15 INCHES AND LARGER, THE ALLOWABLE WIDTH SHALL BE EQUAL TO THE PIPES OUTSIDE DIAMETER PLUS 24 INCHES.
- PIPE TRENCH BEDDING MATERIAL AND FILL MATERIAL FOR EXCAVATION BELOW GRADE SHALL BE SCREENED GRAVEL OR CRUSHED STONE TO ASTM C33-03 STONE SIZE NO. 67. THE PIPE SAND BLANKET MATERIAL SHALL BE GRADED SAND FREE FROM ANY ORGANIC MATERIALS, GRADED SUCH THAT 100 PERCENT PASSED THE 1/2-INCH SIEVE AND A MAXIMUM OF 15 PERCENT PASSES A #200 SIEVE. IN LIEU OF A SAND BLANKET, A STONE ENVELOPE 6 INCHES THICK COMPLETELY AROUND THE PIPE USING 3/4-INCH STONE MAY BE USED.
- PIPE BEDDING MATERIAL SHALL EXTEND FROM A HORIZONTAL PLANE THROUGH THE PIPE AXIS TO 6-INCHES BELOW THE BOTTOM OF THE OUTSIDE SURFACE OF THE PIPE.
- PIPE SAND BLANKET MATERIAL SHALL COVER THE PIPE A MINIMUM OF 12 INCHES ABOVE THE CROWN OF THE OUTSIDE SURFACE.
- COMPACTION SHALL BE IN 12-INCH LAYERS FOR BEDDING AND BLANKET MATERIALS.
- BACKFILL MATERIAL SHALL BE IN 3-FOOT LAYERS TO THE GROUND SURFACE EXCEPT FOR ROAD CONSTRUCTION WHERE THE FINAL 3-FEET SHALL BE COMPACTED IN 12-INCH LAYERS TO THE ROAD BASE SURFACE.
- TRENCH BACKFILL MATERIAL IN ROADWAY LOCATIONS SHALL BE NATURAL MATERIALS EXCAVATED FROM THE TRENCH DURING CONSTRUCTION, EXCLUDING DEBRIS, PAVEMENT PIECES, ORGANIC MATTER, TOP SOIL, WET OR SOFT MUCK, PEAT, CLAY, EXCAVATED LEDGE, ROCKS OVER 6 INCHES IN THE LARGEST DIMENSION, OR ANY OTHER UNSUITABLE MATERIAL NOT APPROVED BY THE ENGINEER.
- TRENCH BACKFILL AT CROSS-COUNTRY LOCATIONS SHALL BE AS DESCRIBED ABOVE EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK OR PEAT, IF HE IS SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER FOR MAINTENANCE AND POSSIBLE RECONSTRUCTION, WHEN NECESSARY WILL BE PRESERVED. BACKFILL SHALL BE MOUNDING 6-INCHES ABOVE ORIGINAL GROUND.
- BASE COURSE MATERIALS FOR TRENCH REPAIRS SHALL MEET THE REQUIREMENTS OF DIVISION 300 OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION.
- WHERE SHEETING IS PLACED ALONG SIDE OF THE PIPE AND EXTENDS BELOW MID-DIAMETER, THE SHEETING SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION NOT LESS THAN ONE FOOT ABOVE THE TOP OF THE PIPE AND AT LEAST 3 FEET BELOW FINISH GRADE.
- TRENCHES FOR SEWER PIPES WITH SLOPES OVER 0.08 FEET PER FOOT AND TRENCHES FOR SEWER PIPES BELOW THE SEASONAL HIGH GROUND WATER LEVEL SHALL HAVE IMPERVIOUS TRENCH DAMS CONSTRUCTED EVERY 300 FEET TO PREVENT POTENTIAL DISTURBANCE TO PIPE BEDDING AND BLANKET MATERIALS.

# SITE DEVELOPMENT PLANS

TAX MAP 52 LOT 112A  
**DETAILS**  
**C/A DESIGN, INC.**  
**131 PORTSMOUTH AVE. EXETER NH**  
 OWNED BY  
**NH EXETER PROPERTIES, LLC**  
 PREPARED FOR  
**C/A DESIGN, INC.**  
**SCALE: NTS** **FEBRUARY 28, 2023**



REV	DATE	DESCRIPTION	DR	CK
1	3/31/2023	REVISED PER EXETER TRC REVIEW	JD	TCB

45659-51	DR	JED	FB	-
	CK	TCB	CADFILE	45659-51 COVER AND DETAILS

C-14

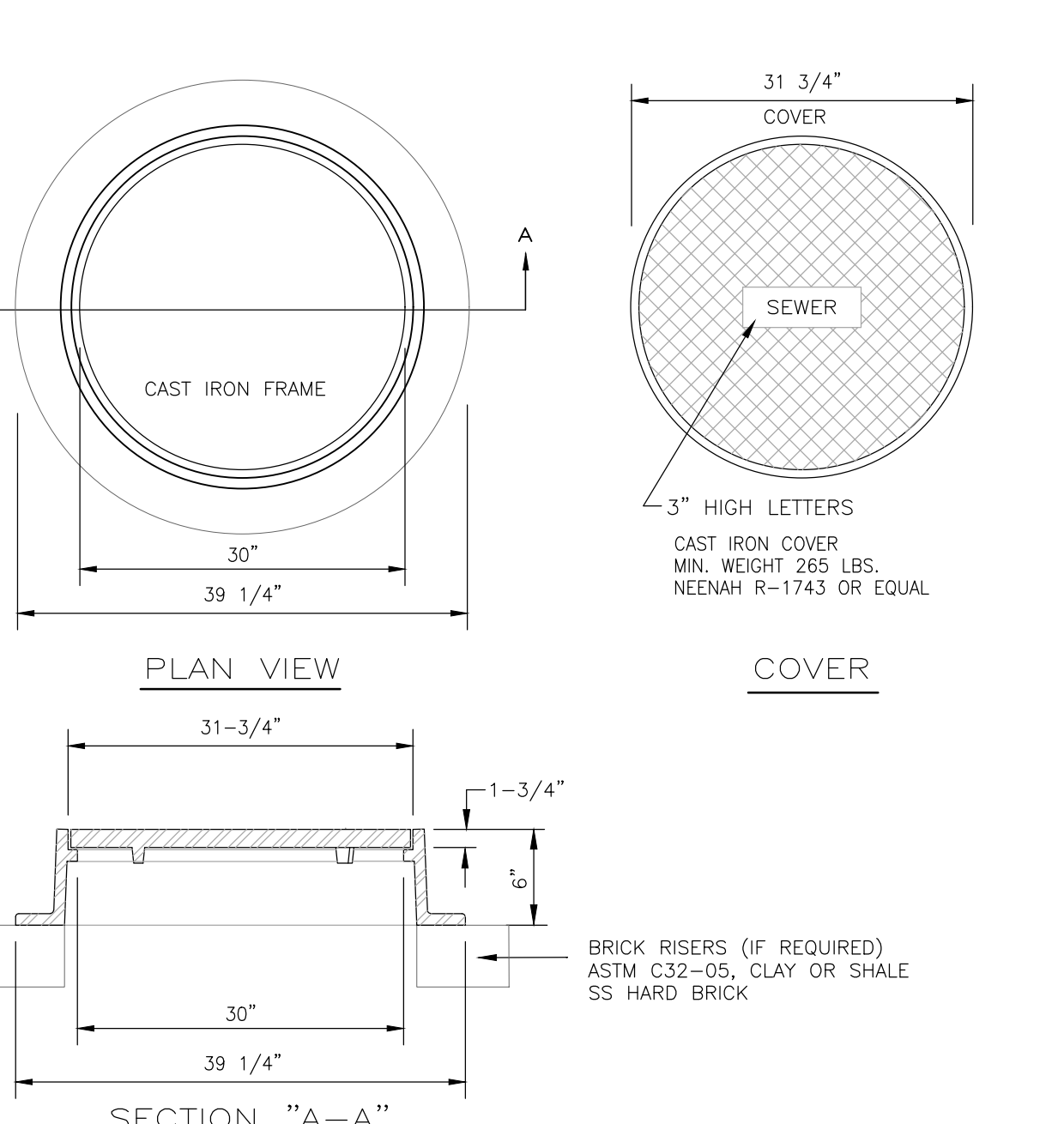
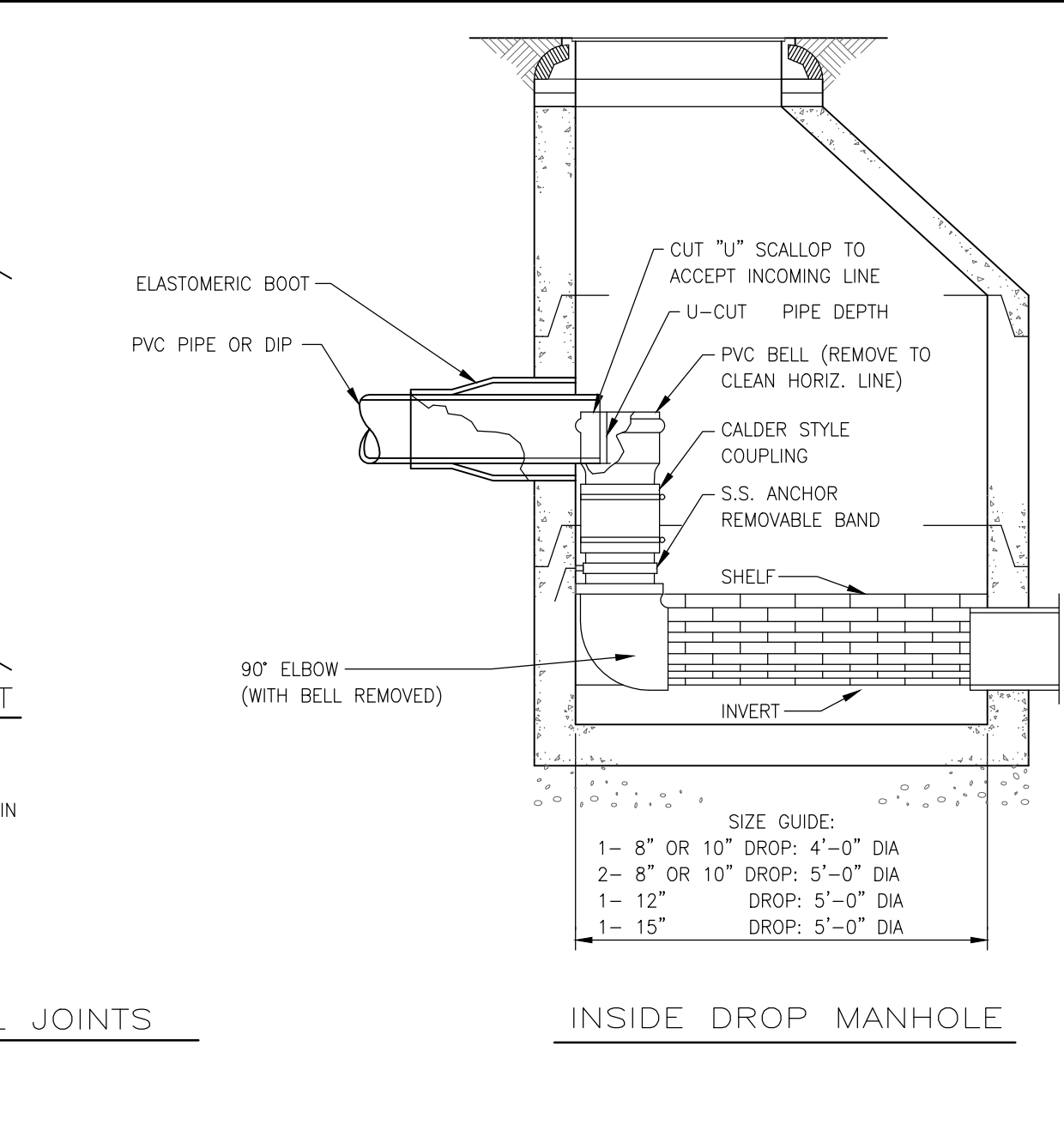
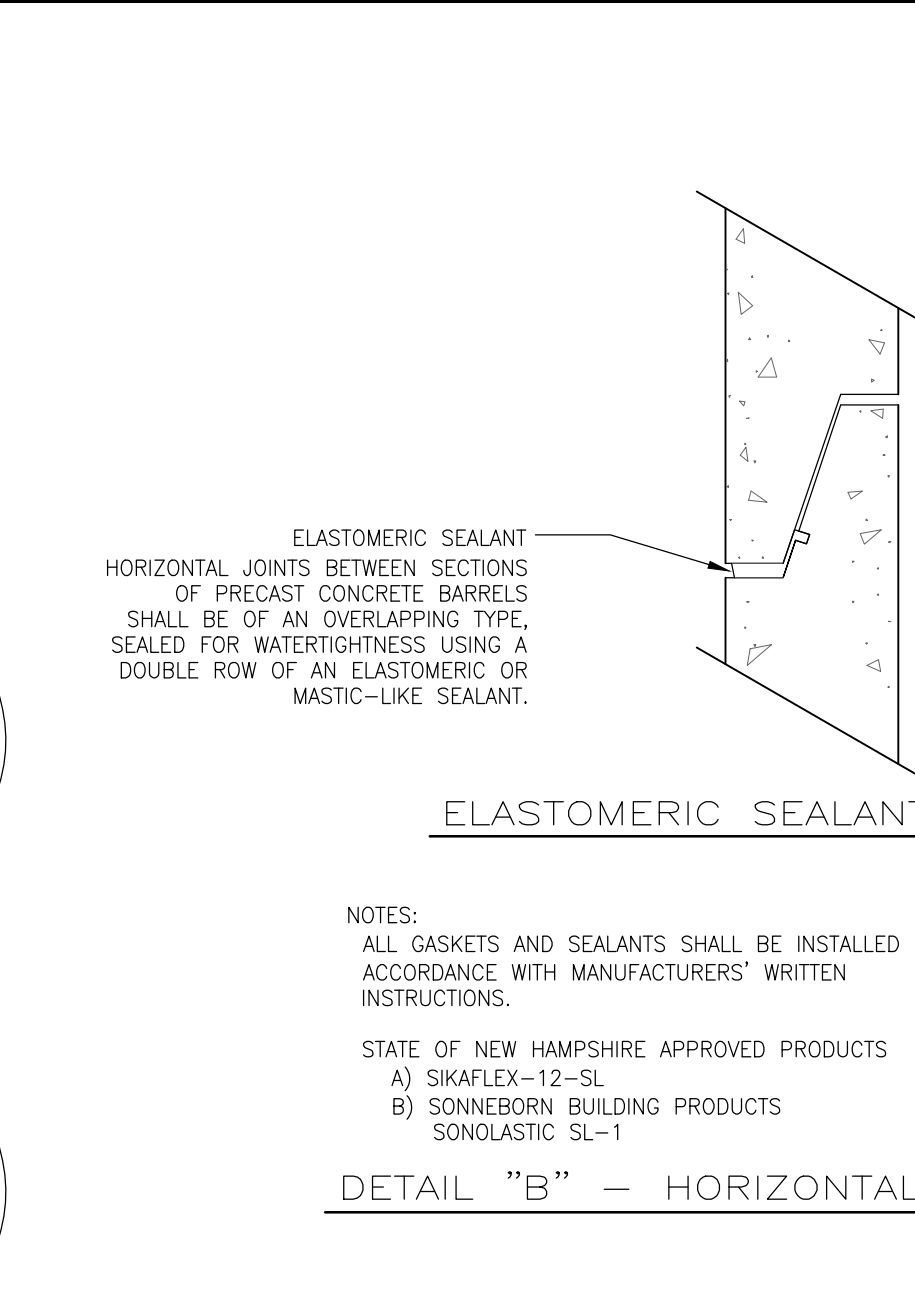
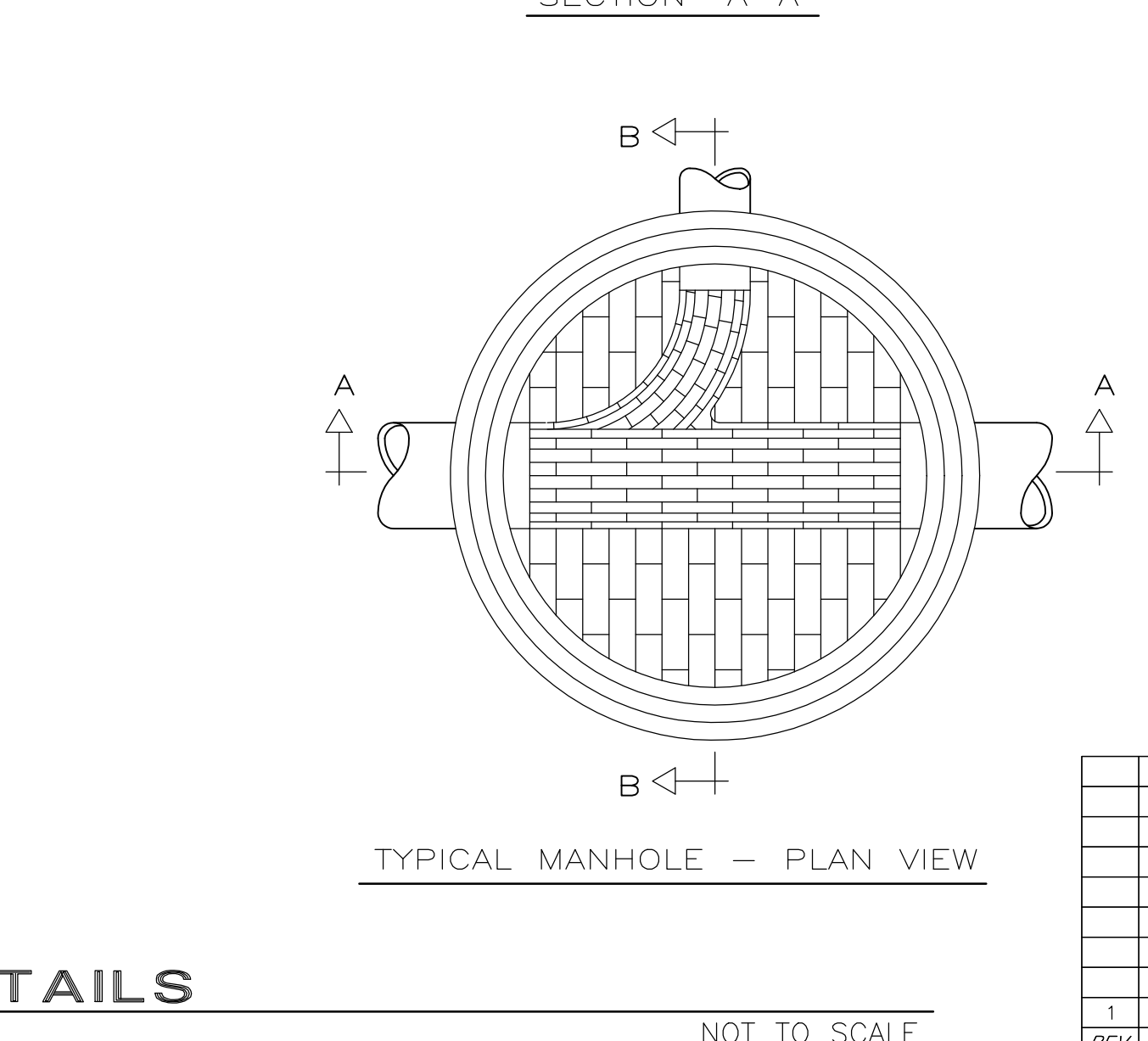
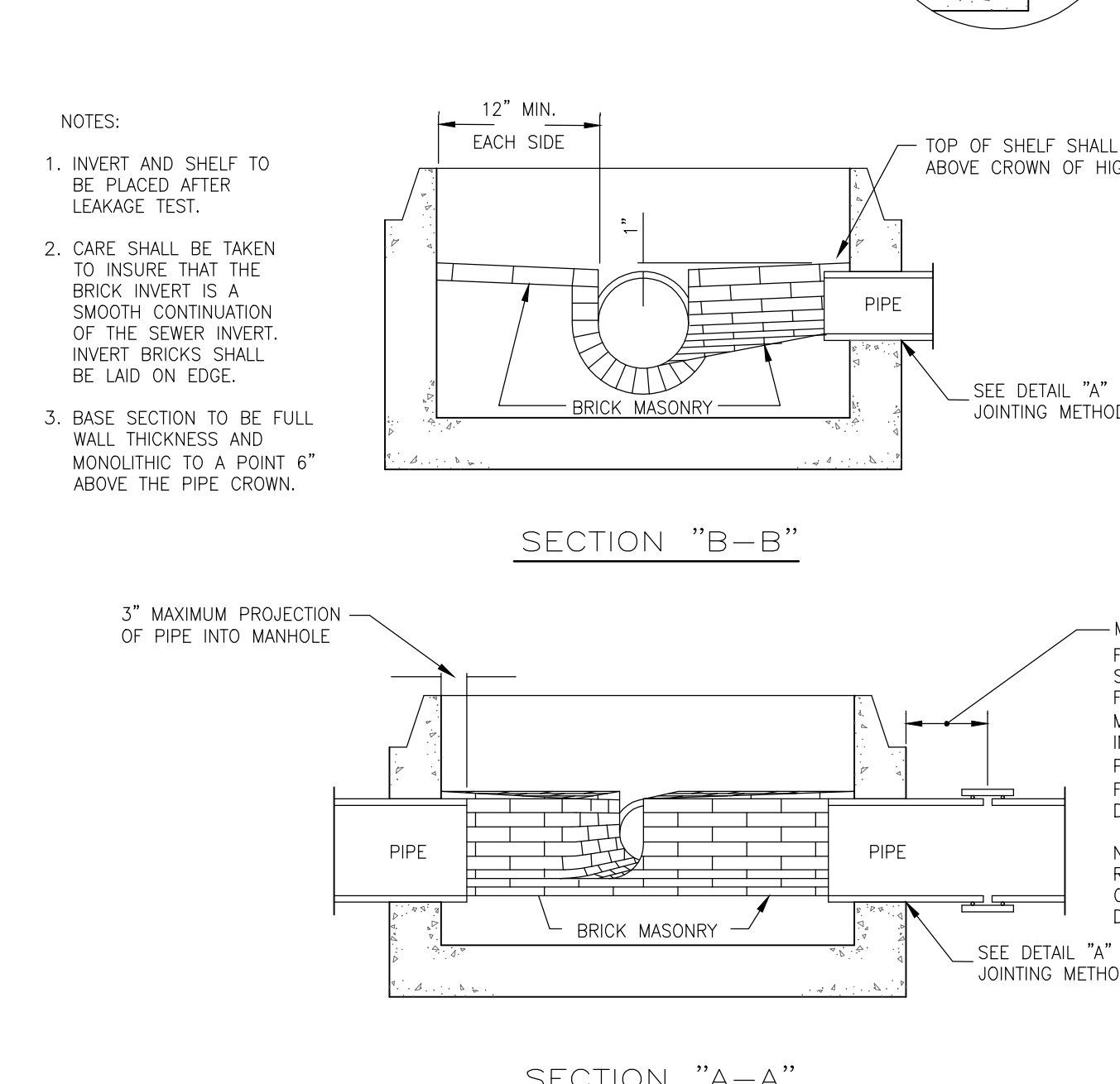
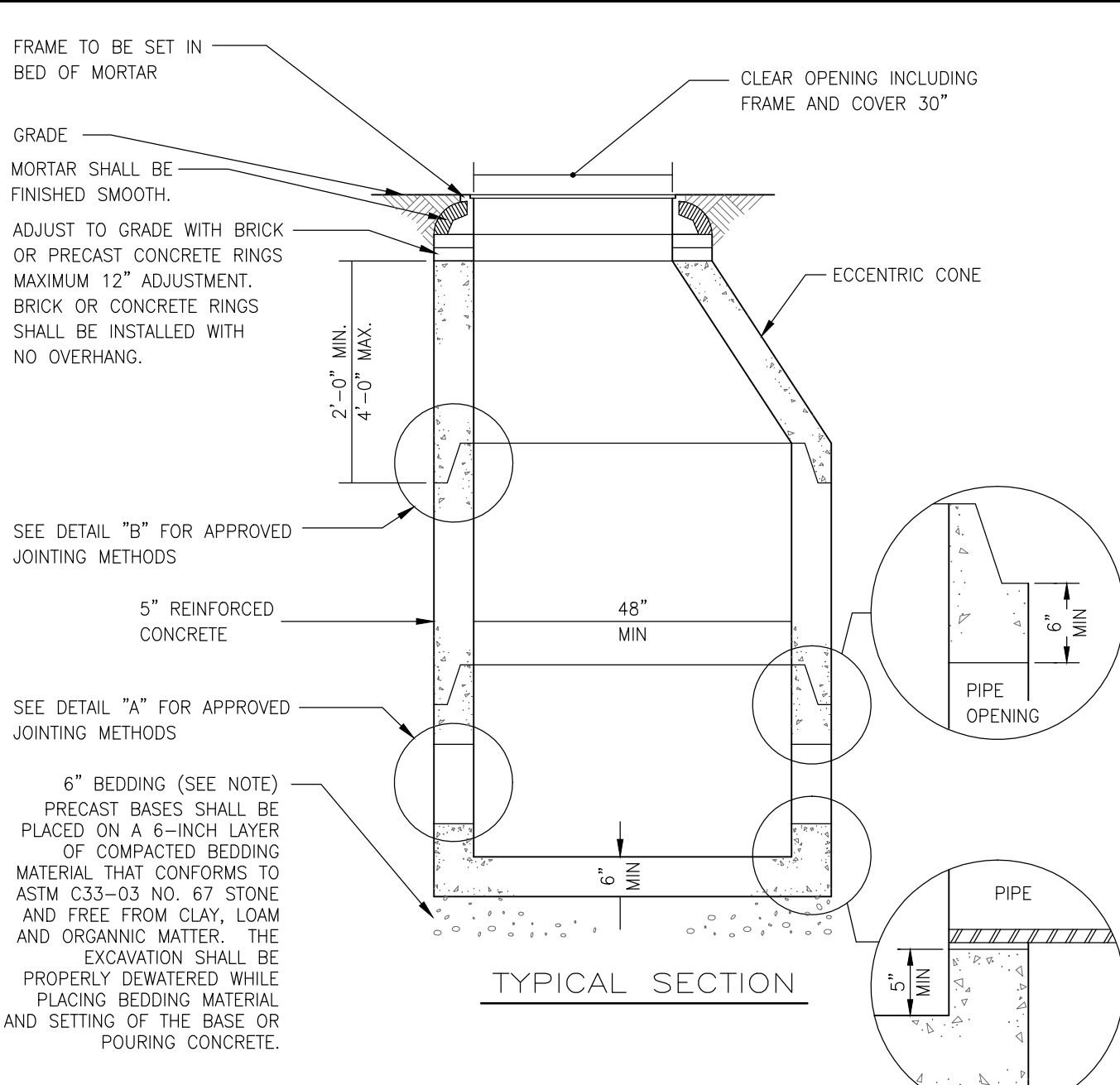
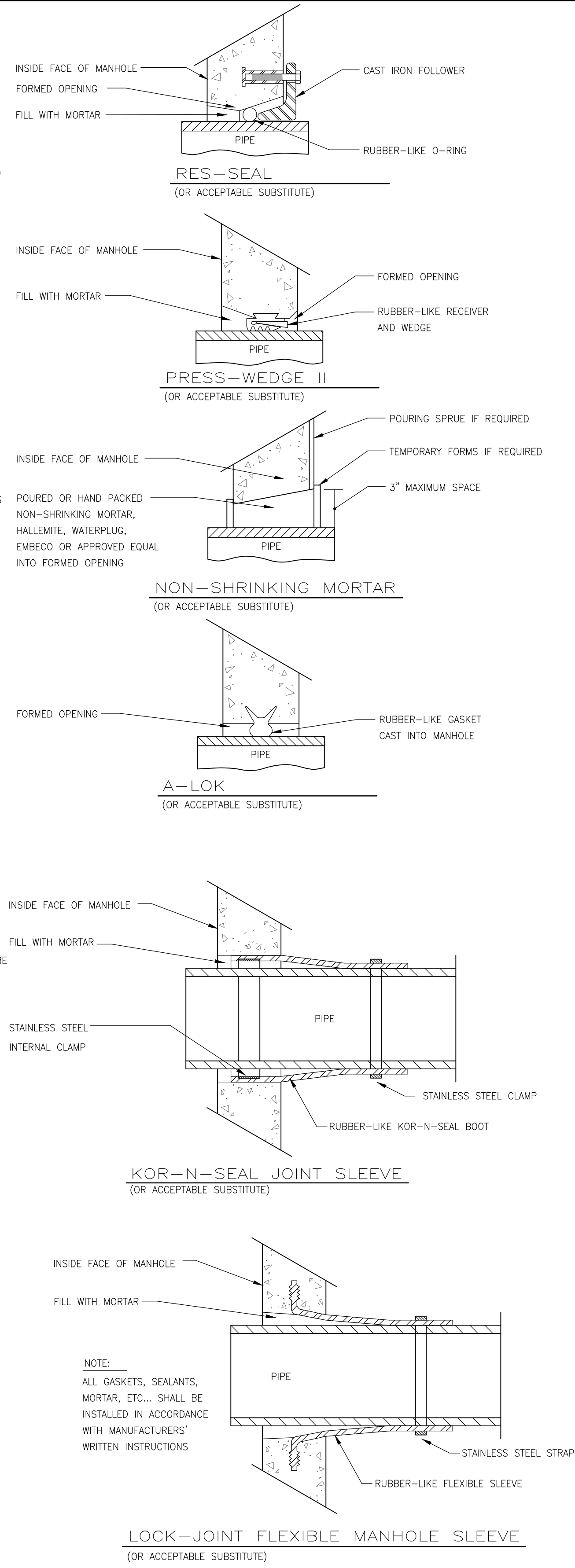
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 CONTACT US AT LEAST 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

# GENERAL NOTES

- IT IS THE INTENTION THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH AND LEAKPROOF QUALITIES CONSIDERED NECESSARY FOR THE INTENDED SERVICE. SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES SHALL BE AN ASSEMBLY OF PRECAST SECTIONS, WITH STEEL REINFORCEMENT, WITH ADEQUATE JOINTING, OR CONCRETE CAST MONOLITHICALLY IN PLACE WITH REINFORCEMENT. IN ANY APPROVED MANHOLE, THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND LOADS OF 8 TONS (H=20 LOADING) WITHOUT FAILURE AND PREVENT LEAKAGE IN EXCESS OF ONE GALLON PER DAY PER VERTICAL FOOT OF MANHOLE, CONTINUOUSLY FOR THE LIFE OF THE STRUCTURE. A PERIOD GENERALLY IN EXCESS OF 25 YEARS IS TO BE UNDERSTOOD IN BOTH CASES.
- BARRELS, CONE SECTIONS AND CONCRETE GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE AND SHALL CONFORM ENV-WQ 704.12 & 704.13.
- PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C478-06.
- BASE SECTIONS SHALL BE OF MONOLITHIC CONSTRUCTION TO A POINT AT LEAST 6 INCHES ABOVE THE CROWN OF THE INCOMING PIPE.
- MANHOLE CONE SECTIONS SHALL BE ECCENTRIC IN SHAPE.
- ALL PRECAST SECTIONS AND BASES SHALL HAVE THE DATE OF MANUFACTURE AND THE NAME OR TRADEMARK OF THE MANUFACTURER IMPRESSED OR INDELIBLY MARKED ON THE INSIDE WALL.
- ALL PRECAST SECTIONS AND BASES SHALL BE COATED ON THE EXTERIOR WITH A BITUMINOUS DAMP-PROOFING COATING.
- SHALLOW MANHOLE: IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H=20 LOADS.
- HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF AN OVERLAPPING TYPE, SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW OF AN ELASTOMERIC OR MASTIC-LIKE SEALANT. APPROVED ELASTOMERIC SEALANTS ARE:
  - SIKAFLEX-12-SL
  - SONNEBORN BUILDING PRODUCTS--SONOLASTIC SL-1
- THE MINIMUM INTERNAL DIAMETER OF MANHOLES SHALL BE 48 INCHES. FOR SEWERS LARGER THAN 24-INCH DIAMETER, MANHOLE DIAMETERS SHALL BE INCREASED SO AS TO PROVIDE AT LEAST 12-INCHES OF SHELF ON EACH SIDE OF THE SEWER.
  - ALL MANHOLES SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST IN ACCORDANCE WITH THE ASTM C1244 STANDARD IN EFFECT WHEN THE TESTING IS PERFORMED.
  - THE MANHOLE VACUUM TEST SHALL CONFORM TO THE FOLLOWING:
    - THE INITIAL VACUUM GAUGE TEST PRESSURE SHALL BE 10 INCHES Hg.
    - THE MINIMUM ACCEPTABLE TEST HOLD TIME FOR 1-INCH Hg PRESSURE DROP TO 9 INCHES SHALL BE:
      - NOT LESS THAN 2 MINUTES FOR MANHOLES LESS THAN 10 FEET DEEP.
      - NOT LESS THAN 2.5 MINUTES FOR MANHOLES 10 TO 15 FEET DEEP.
      - NOT LESS THAN 3 MINUTES FOR MANHOLES MORE THAN 15 FEET DEEP.
  - THE MANHOLE SHALL BE REPAIRED AND RETESTED IF THE TEST HOLD TIMES FAIL TO ACHIEVE THE ACCEPTANCE LIMITS SPECIFIED IN (b) ABOVE.
  - INVERTS AND SHELVES SHALL NOT BE INSTALLED UNTIL AFTER SUCCESSFUL TESTING IS COMPLETE.
  - FOLLOWING COMPLETION OF THE LEAKAGE TEST, THE FRAME AND COVER SHALL BE PLACED ON TOP OF THE MANHOLE OR SOME OTHER MEANS USED TO PREVENT ACCIDENTAL ENTRY BY UNAUTHORIZED PERSONS, CHILDREN OR ANIMALS, UNTIL THE CONTRACTOR IS READY TO MAKE FINAL ADJUSTMENT TO GRADE.
- BRICK MASONRY FOR SHELF, INVERT AND GRADE ADJUSTMENT SHALL COMPLY WITH ASTM C32-05, CLAY OR SHALE, FOR GRADE SS HARD BRICK.
- MORTAR SHALL BE COMPOSED OF PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION. PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE:
  - 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
  - 4.5 PARTS SAND, 1 PART CEMENT AND 0.5 PART HYDRATED LIME

CEMENT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C150-05. HYDRATED LIME SHALL BE TYPE S CONFORMING TO ASTM C207-06 "STANDARD SPECIFICATIONS FOR HYDRATED LIME FOR MASONRY PURPOSES". SAND SHALL CONSIST OF INERT NATURAL SAND CONFORMING TO ASTM C33-03 "STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES".
- INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED OR PRECAST CONCRETE SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF THE PIPE AND FLOW. AT CHANGES IN DIRECTIONS, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY.
- FRAMES AND COVERS: MANHOLES FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN, CLASS 30, CONFORMING TO ASTM A48/48M AND PROVIDE A 30-INCH CLEAR OPENING. 3-INCH WORD (MINIMUM HEIGHT) LETTERS "SEWER" SHALL BE PLAINLY CAST INTO THE TOP SURFACE. THE CASTING SHALL BE OF EVEN GRAINED CAST IRON, SMOOTH, AND FREE FROM SCALE, LUMPS, BUSTERS, SAND HOLES AND DEFECTS. CONTACT SURFACES OF COVERS AND FRAMES SHALL BE MACHINED AT THE FOUNDRY TO PREVENT ROCKING OF COVERS IN ANY ORIENTATION.
- BEDDING: PRECAST BASES SHALL BE PLACED ON A 6-INCH LAYER OF COMPACTED BEDDING MATERIAL THAT CONFORMS TO ASTM C33-03 NO. 67 STONE AND FREE FROM CLAY, LOAM AND ORGANIC MATTER. THE EXCAVATION SHALL BE PROPERLY DEWATERED WHILE PLACING BEDDING MATERIAL AND SETTING OF THE BASE OR POURING CONCRETE. WATER-STOPS SHALL BE USED AT THE HORIZONTAL JOINT OF THE CAST-IN-PLACE MANHOLES.
 

100% PASSING	1" SCREEN
90-100% PASSING	3/4" SCREEN
20-55% PASSING	3/8" SCREEN
0-10% PASSING	#4 SIEVE
0-5% PASSING	#8 SIEVE
- FLEXIBLE JOINT: A FLEXIBLE JOINT SHALL BE PROVIDED WITHIN THE FOLLOWING DISTANCES FROM ANY MANHOLE CONNECTION: (a) WITHIN 48 INCHES FOR REINFORCED CONCRETE PIPE (RCP). (b) WITHIN 60 INCHES FOR PVC PIPE LARGER THAN 15" DIAMETER.
- NO FLEXIBLE JOINT SHALL BE REQUIRED FOR DUCTILE IRON PIPE OR PVC PIPE UP THROUGH 15-INCH DIAMETER.
- PIPE TO MANHOLE JOINTS SHALL BE ONLY AS FOLLOWS:
  - ELASTOMERIC, RUBBER SLEEVE WITH WATERTIGHT JOINTS AT THE MANHOLE OPENING AND PIPE SURFACES.
  - CAST INTO WALL OR SECURED WITH STAINLESS STEEL CLAMPS.
  - ELASTOMERIC SEALING RING CAST IN THE MANHOLE OPENING WITH THE SEAL FORMED ON THE SURFACE OF THE PIPE BY COMPRESSION OF THE RING.
  - NON-SHRINK GROUTED JOINTS WHERE WATERTIGHT BONDING TO THE MANHOLE AND PIPE CAN BE OBTAINED.
- THE INVERT OF THE INCOMING PIPE SHALL BE NO MORE THAN 6 INCHES ABOVE THE OUTGOING PIPE UNLESS A DROP ENTRY IS USED.



**SITE DEVELOPMENT PLANS**

TAX MAP 52 LOT 112A

**DETAILS**

**C/A DESIGN, INC.**

131 PORTSMOUTH AVE. EXETER NH

OWNED BY  
**NH EXETER PROPERTIES, LLC**

PREPARED FOR  
**C/A DESIGN, INC.**

SCALE: NTS

FEBRUARY 28, 2023

Professional Engineer Seal: THOMAS C. BURNS No. 11915 LICENSED PROFESSIONAL ENGINEER

TFM Civil Engineers, Structural Engineers, Traffic Engineers, Land Surveyors, Landscape Architects, Scientists

48 Constitution Drive, Bedford, NH 03110, Phone (603) 472-4488, Fax (603) 472-9747, www.tfmoran.com

1	3/31/2023	REVISED PER EXETER TRC REVIEW	JD	TCB
REV	DATE	DESCRIPTION	DR	CK

45659-51

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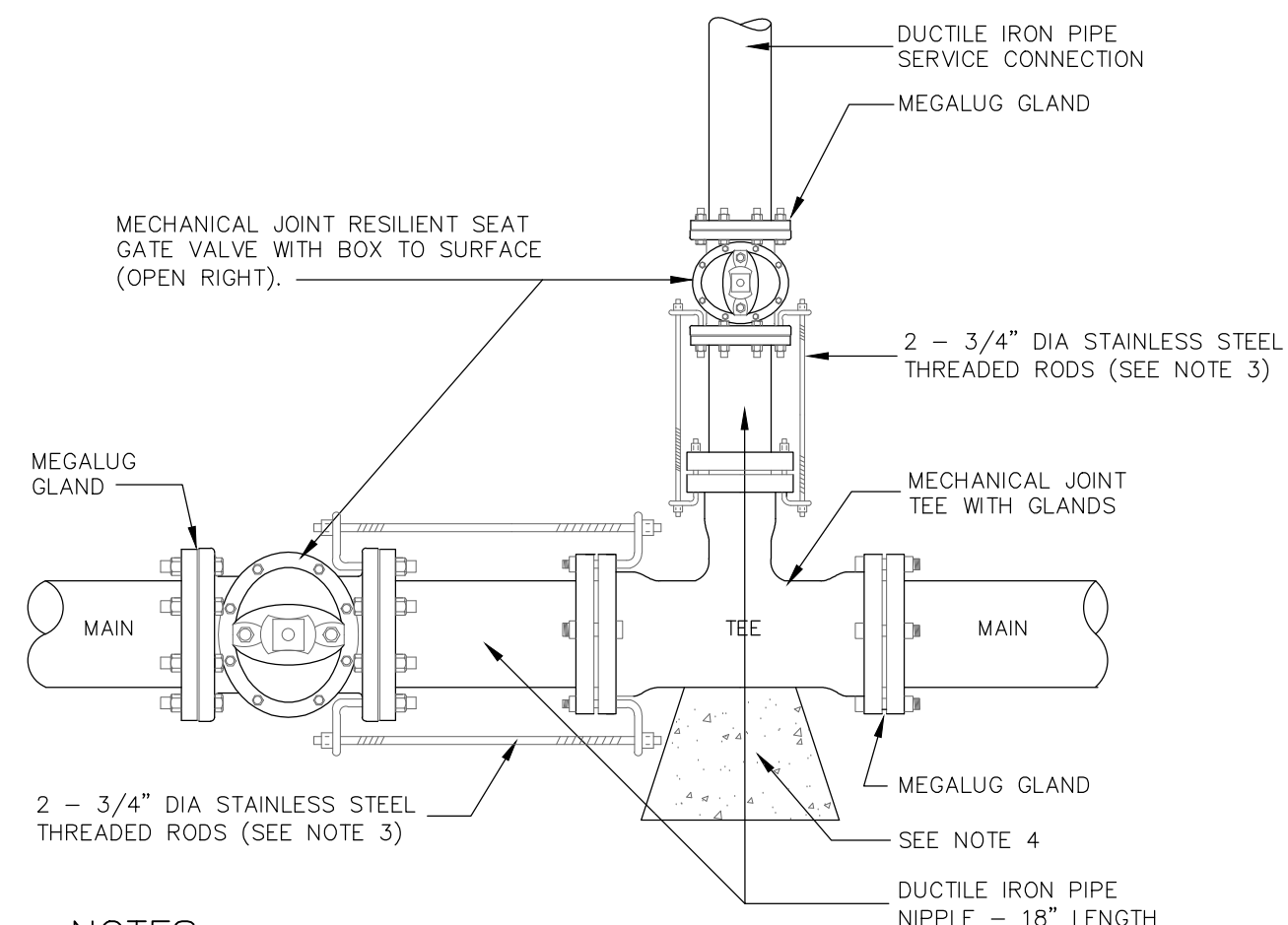
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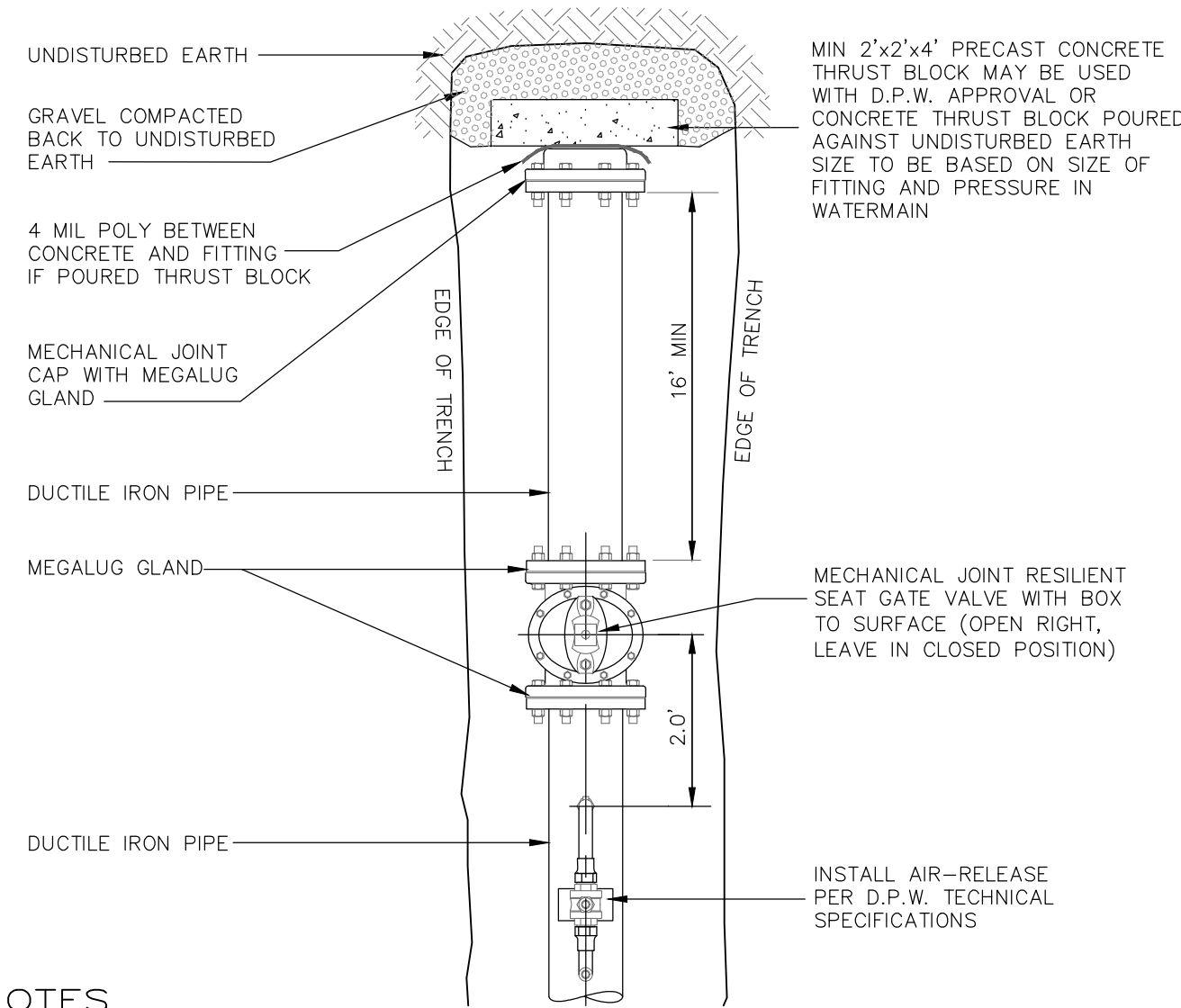


**NOTES**

1. ALL MATERIAL AND INSTALLATION PROCEDURES WILL CONFORM TO CHWP TECHNICAL SPECIFICATIONS.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTHS OF 5.5' FROM TOP OF PIPE TO FINISH GRADE.
3. ALL THREADED RODS AND NUTS MUST BE STAINLESS STEEL.
4. MIN 2'x2'x4' PRECAST CONCRETE THRUST BLOCK MAY BE USED WITH CHWP APPROVAL OR CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH - SIZE TO BE BASED ON SIZE OF FITTING AND PRESSURE IN WATERMAIN.

**TEE INSTALLATION**

NOT TO SCALE



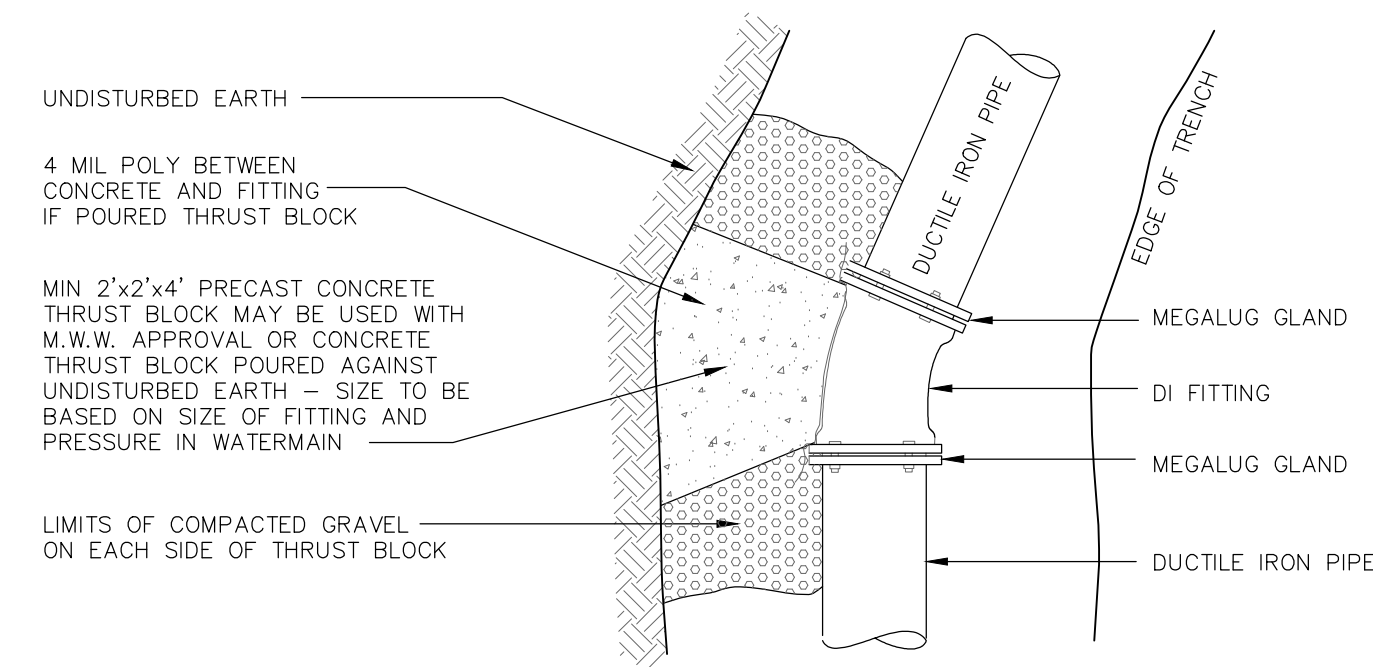
**NOTES**

1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO CHWP TECHNICAL SPECIFICATIONS.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5.5' FROM TOP OF PIPE TO FINISH GRADE.

**END OF MAIN INSTALLATION**

NOT TO SCALE

PIPE SIZE	90° BEND		45° BEND		22½° BEND		11½° BEND		TEE & PLUG	
	WIDTH	HGT.	WIDTH	HGT.	WIDTH	HGT.	WIDTH	HGT.	WIDTH	HGT.
6"	33"	21"	18"	21"	12"	18"	9"	12"	21"	24"
8"	45"	27"	24"	27"	18"	21"	12"	15"	27"	33"
10"	60"	36"	36"	36"	24"	30"	18"	21"	36"	42"
12"	66"	39"	36"	42"	24"	30"	18"	21"	39"	45"
14"	72"	45"	42"	48"	27"	36"	18"	27"	45"	54"

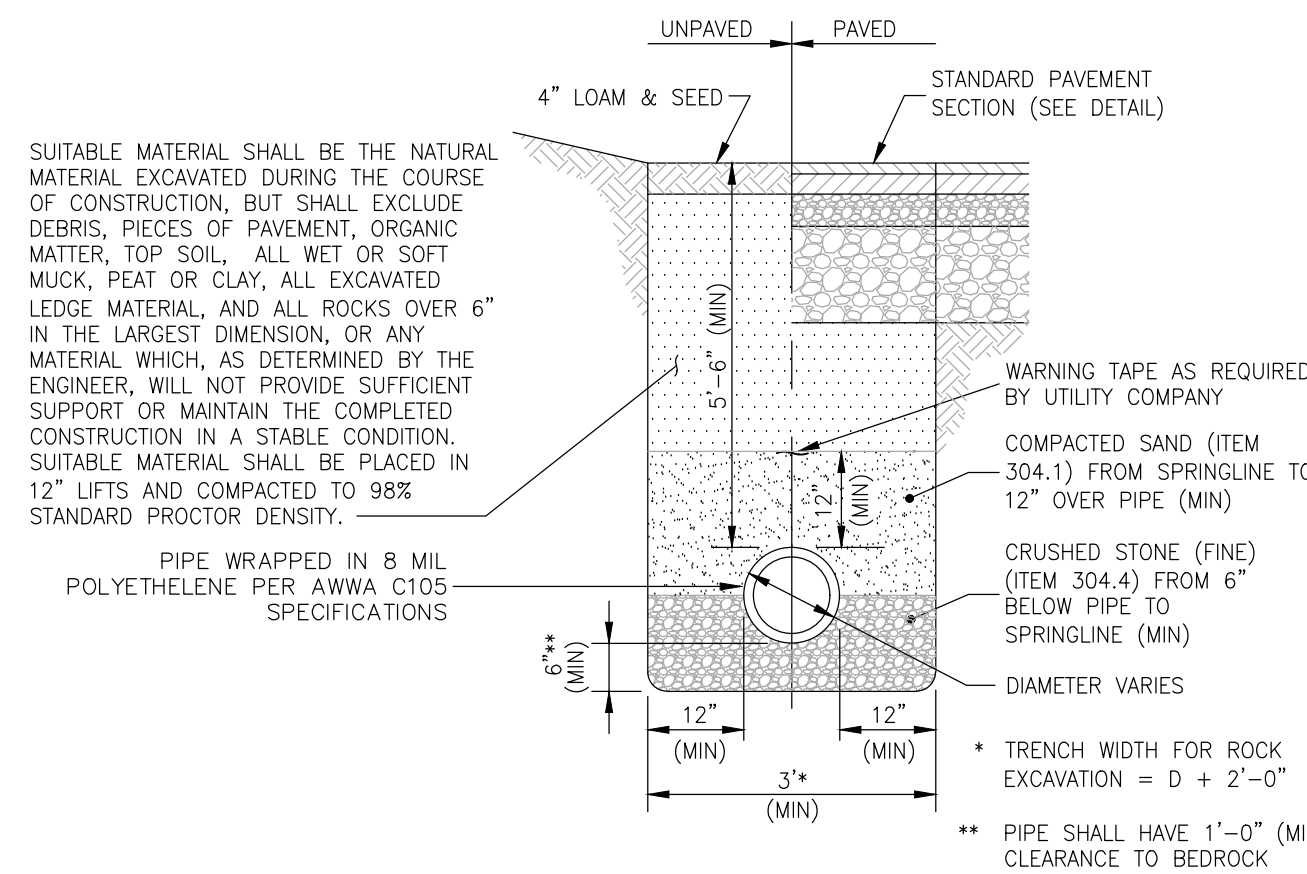


**NOTE**

1. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5.5' FROM TOP OF PIPE TO FINISH GRADE.

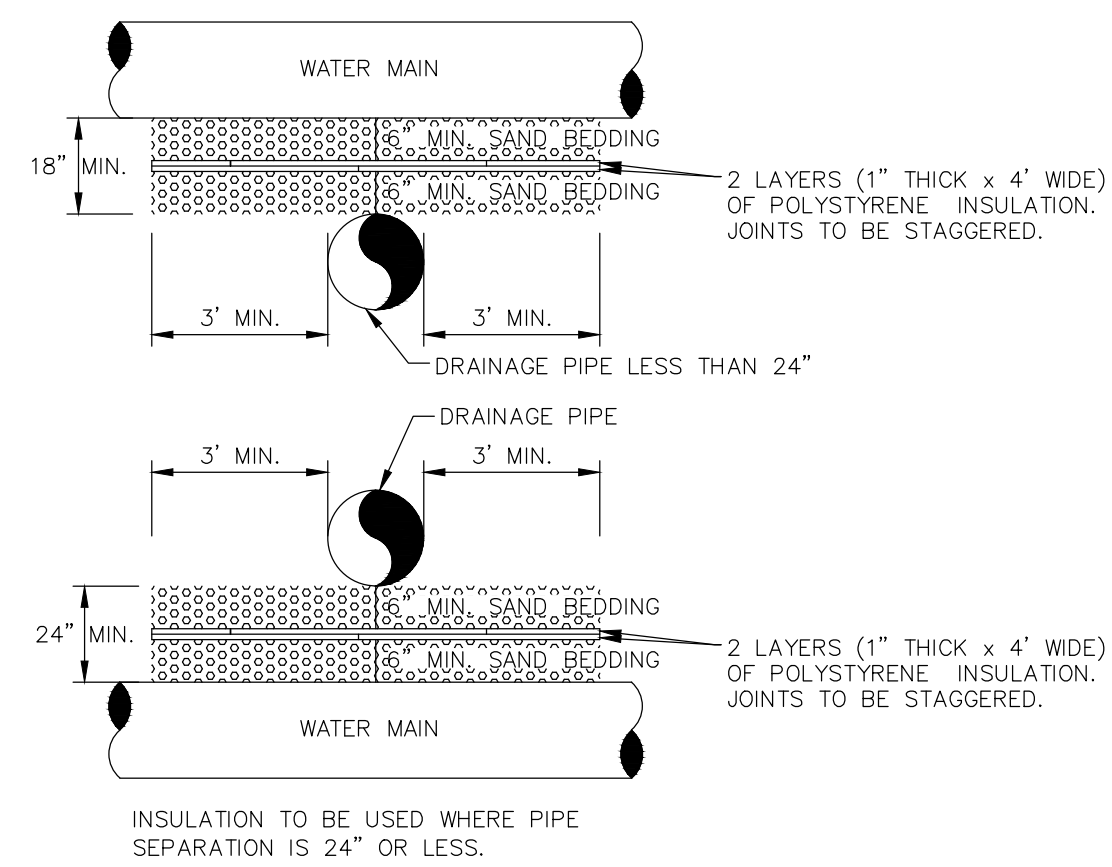
**THRUST BLOCKING BEHIND FITTINGS INSTALLATION**

NOT TO SCALE



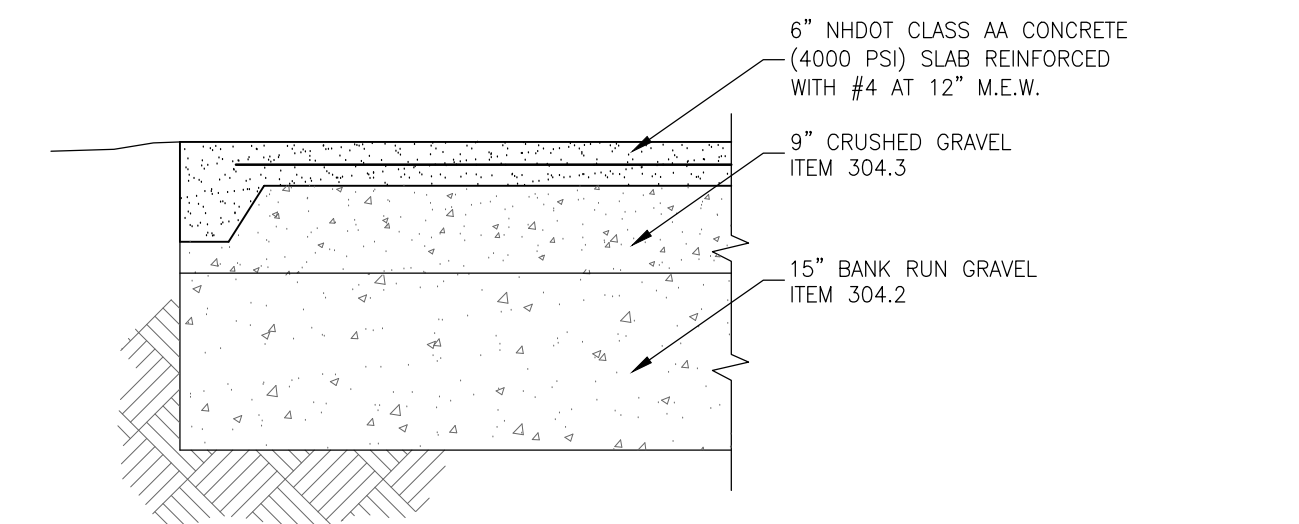
**WATER MAIN TRENCH**

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**WATER/DRAIN TRENCH DETAIL**

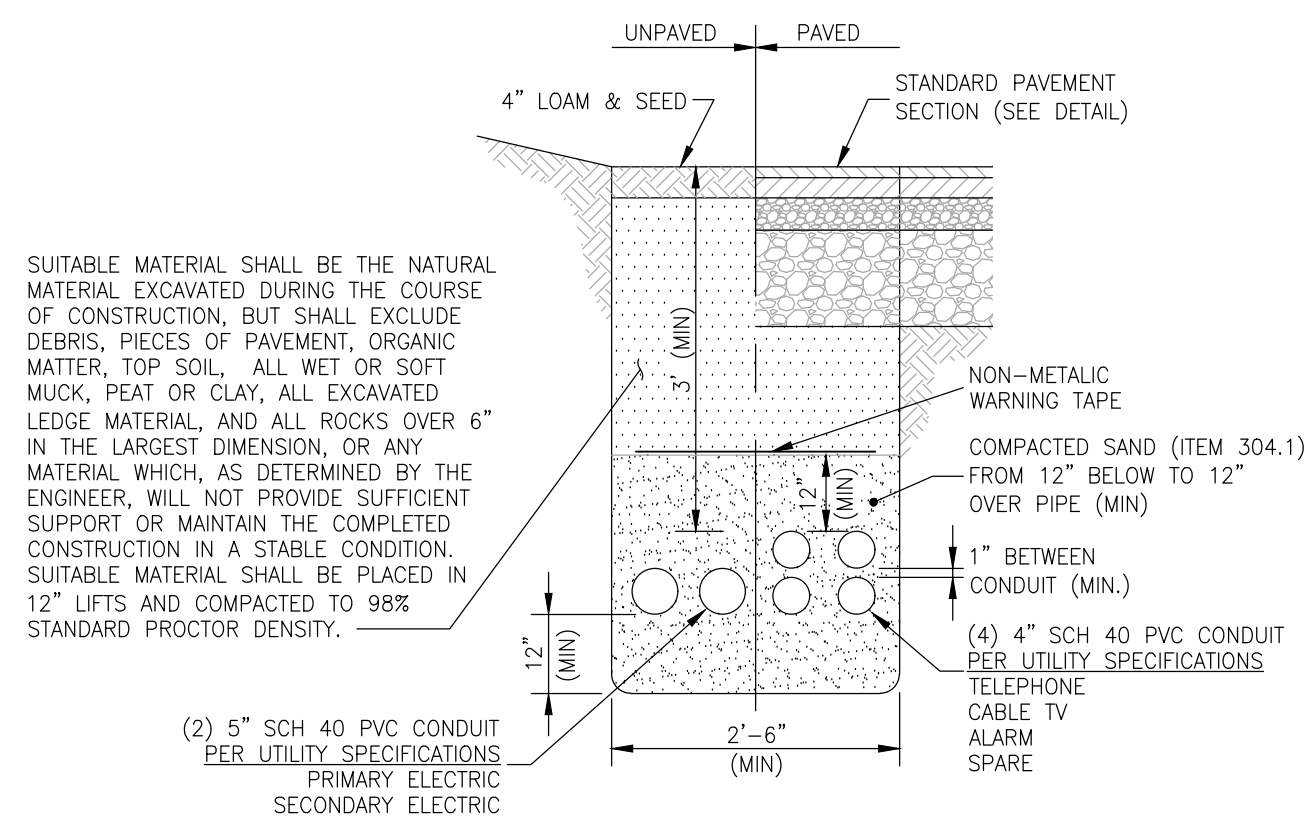
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**CONCRETE PAD**

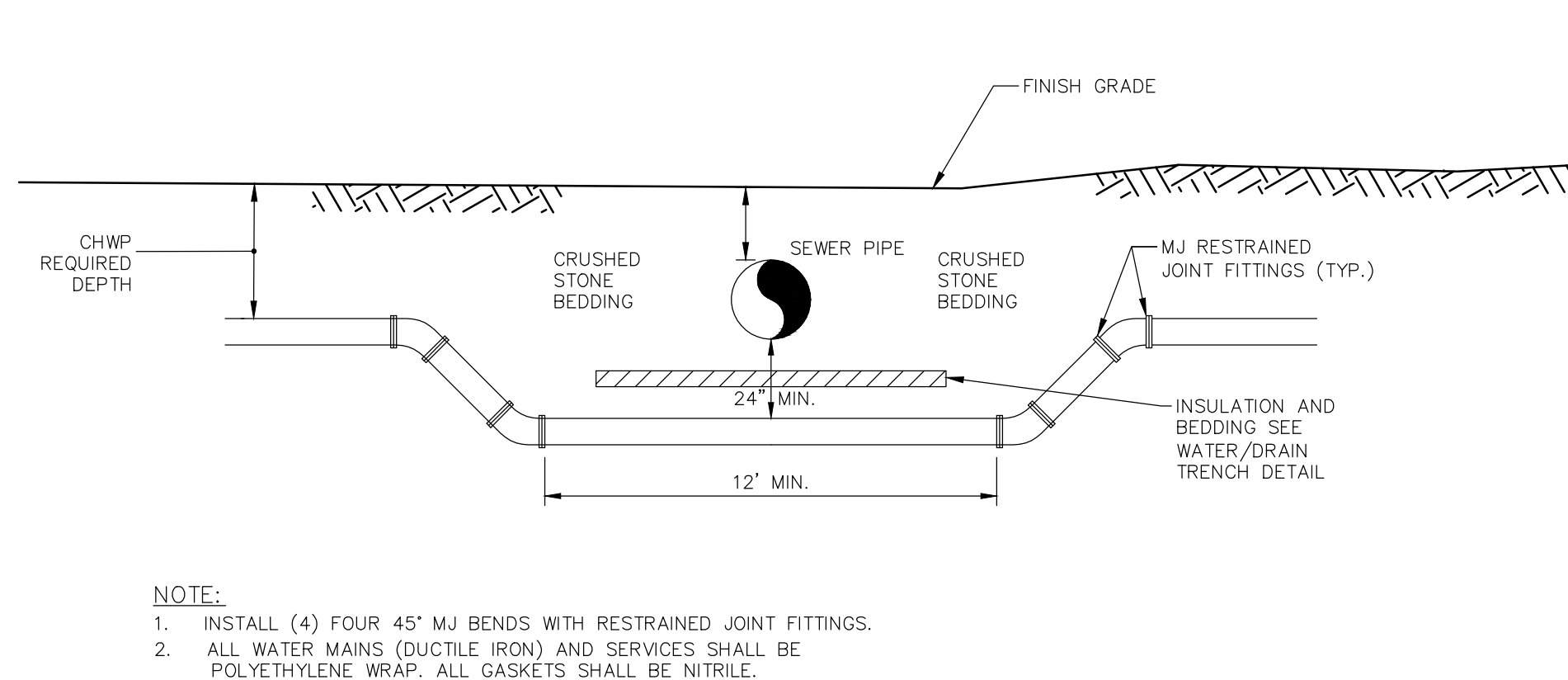
MECHANICAL EQUIPMENT PADS

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**UTILITY TRENCH**

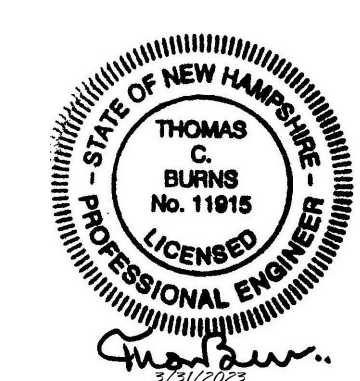
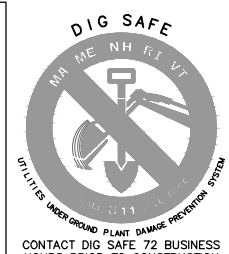
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**WATER/SEWER TRENCH DETAIL**

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45659-51 DR JED FB, CK TCB CADFILE 45659-51 COVER AND DETAILS C-16

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# STORMTECH PRODUCT SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH MC-4500.
- CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
  - A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
  - A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
  - STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

# STORMTECH GENERAL NOTES

- STORMTECH MC-4500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
  - STONESHOOTER LOCATED OFF THE CHAMBER BED.
  - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
  - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
- INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
- STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 12" (300 mm) BETWEEN ADJACENT CHAMBER ROWS.
- STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.
- STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
- THE USE OF EQUIPMENT OVER MC-4500 CHAMBERS IS LIMITED:
  - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
  - NO RUBBER Tired LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
  - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
- FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

## INSPECTION & MAINTENANCE

- INSPECT ISOLATOR ROW FOR SEDIMENT
  - INSPECTION PORTS (IF PRESENT)
    - REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
    - REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
    - USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
    - LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
    - IF SEDIMENT IS AT, OR ABOVE, 3", PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
  - ALL ISOLATOR ROWS
    - REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
    - USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
      - MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
      - FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
    - IF SEDIMENT IS AT, OR ABOVE, 3", PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
  - A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
  - APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
  - VACUUM STRUCTURE SUMP AS REQUIRED
- REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

## NOTES

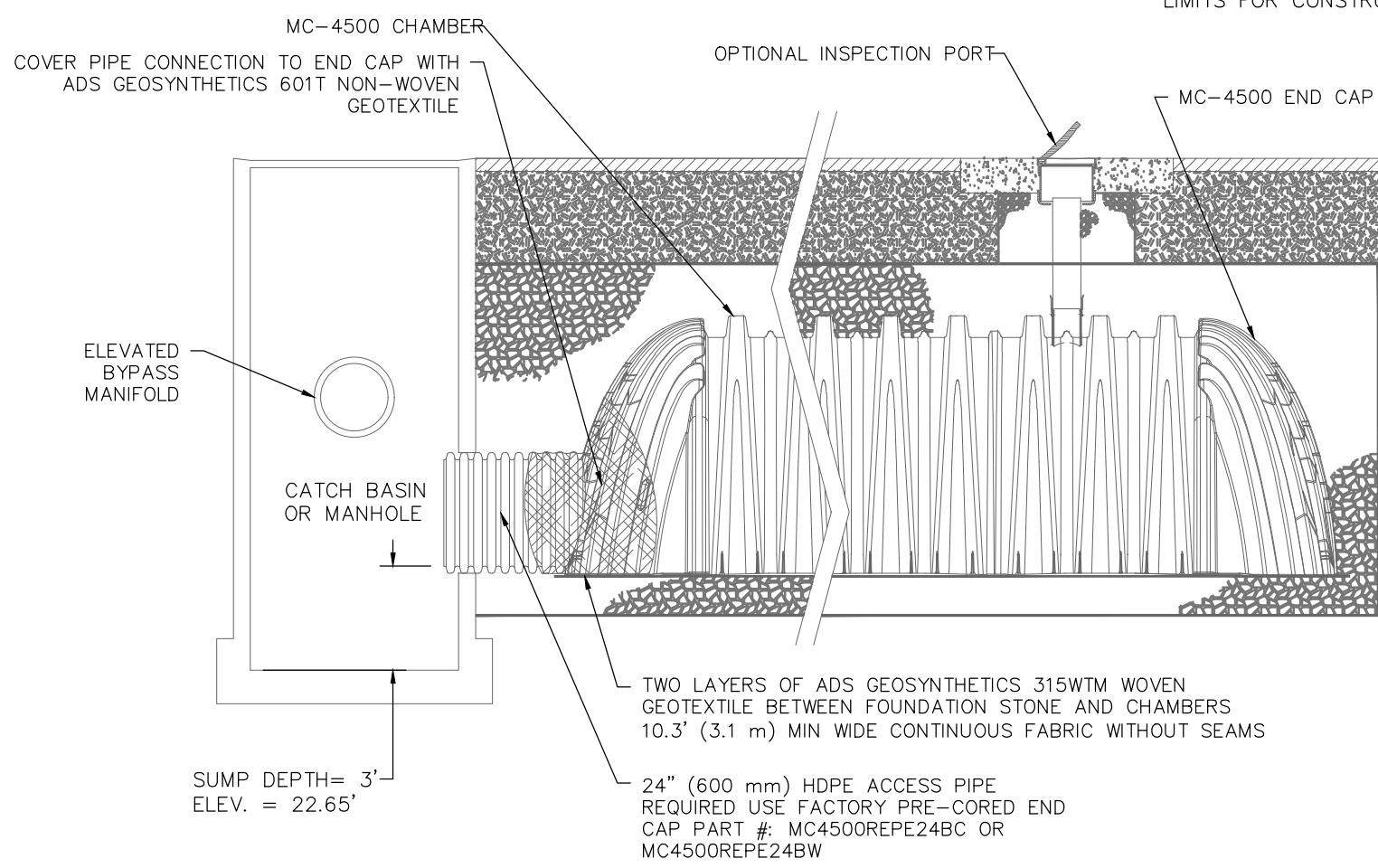
- INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
- CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

# ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL/FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL/FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	AASHTO M145 A-1, A-2-4, A-3 OR AASHTO M43 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY. FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	EMBEDMENT STONE-FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	AASHTO M43 3, 4	NO COMPACTION REQUIRED.
A	FOUNDATION STONE-FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	AASHTO M43 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.

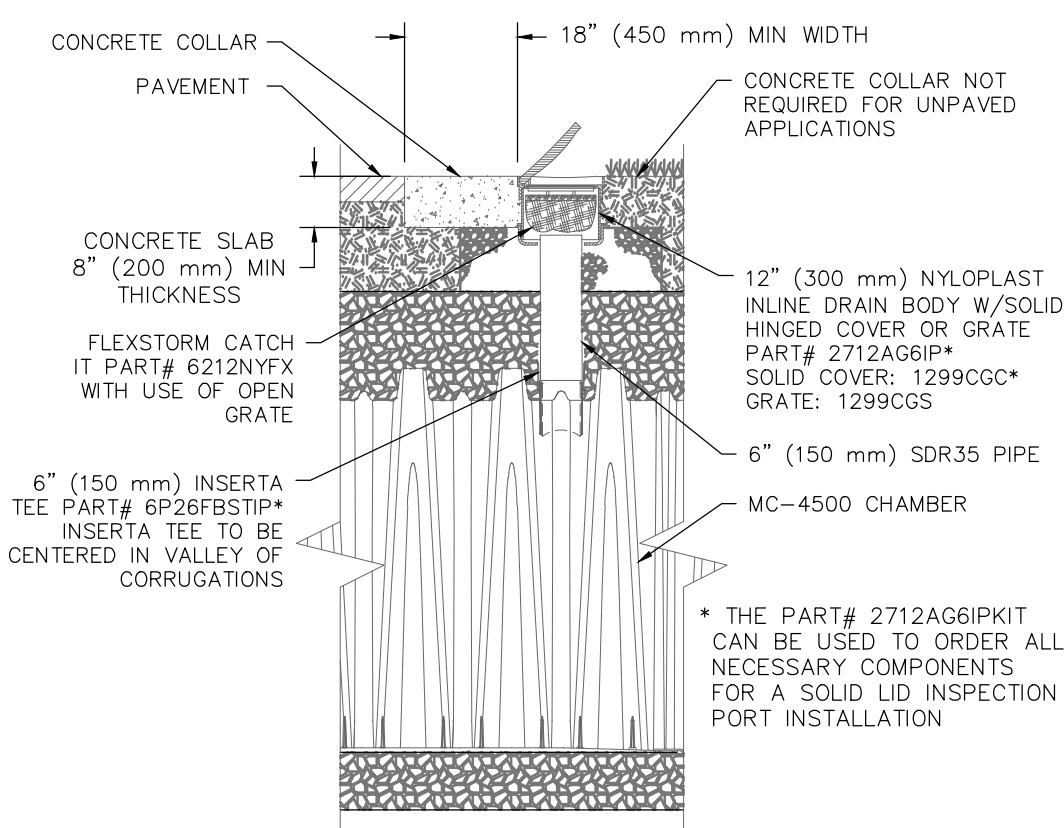
## PLEASE NOTE:

- THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
- STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
- WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



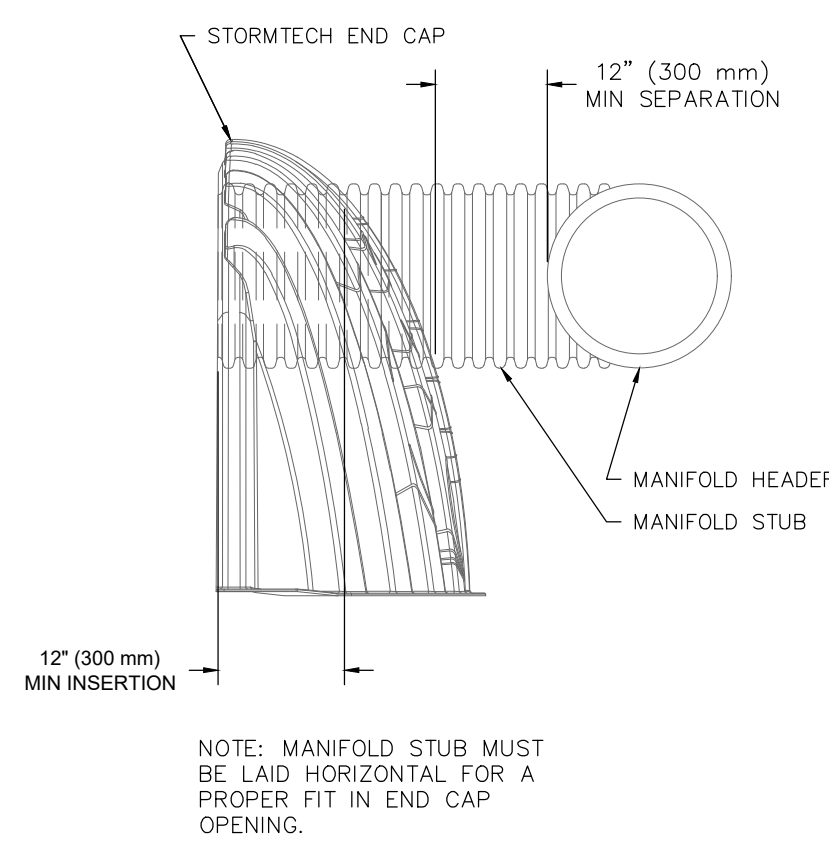
## MC-4500 ISOLATOR ROW DETAIL

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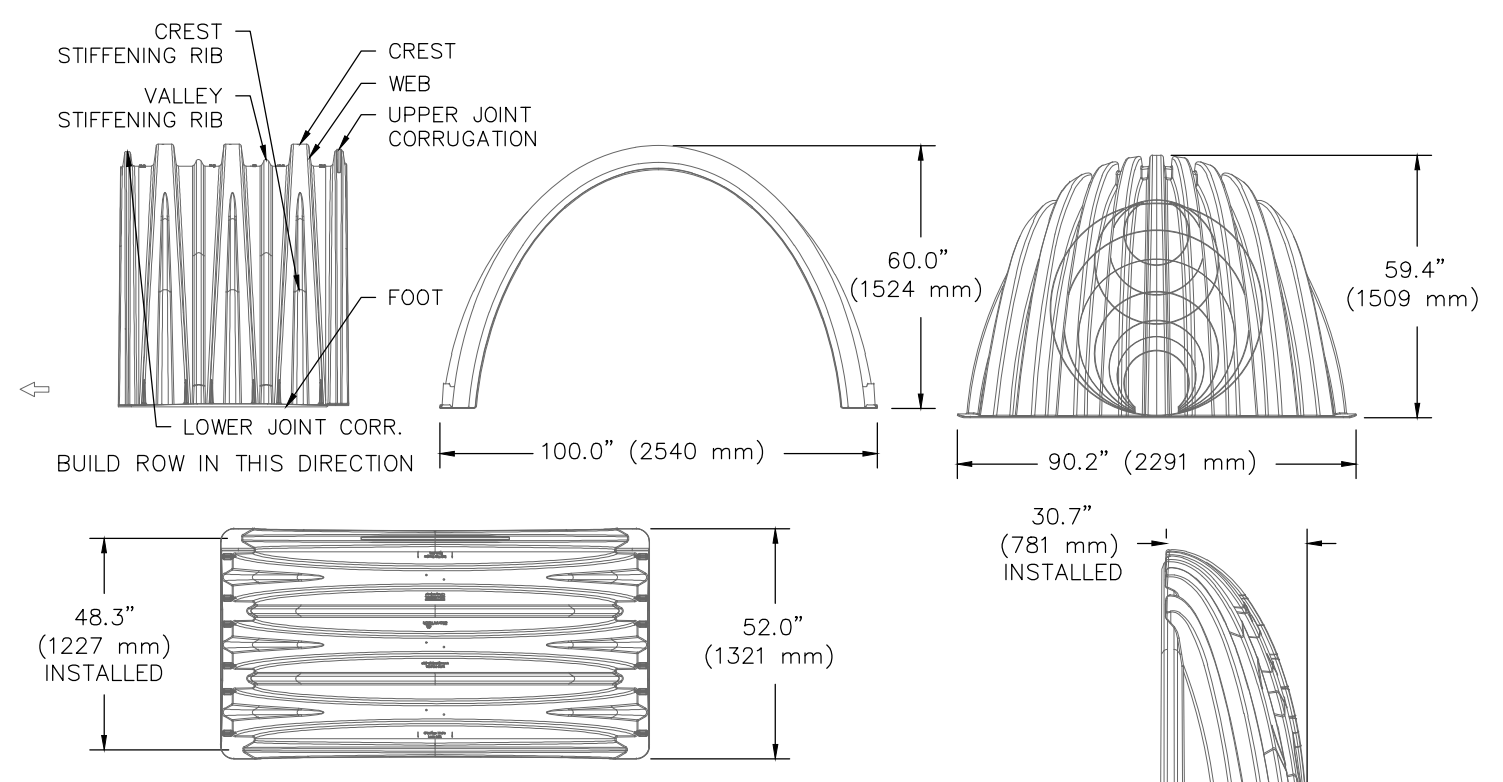
## INSPECTION PORT DETAIL

NOT TO SCALE



## END CAP INSERTION DETAIL

NOT TO SCALE



**NOMINAL CHAMBER SPECIFICATIONS**

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 48.3" (2540 mm X 1524 mm X 1227 mm)
CHAMBER STORAGE	106.5 CUBIC FEET (3.01 m <sup>3</sup> )
MINIMUM INSTALLED STORAGE*	162.6 CUBIC FEET (4.60 m <sup>3</sup> )
WEIGHT	130.0 lbs. (59.0 kg)

**NOMINAL END CAP SPECIFICATIONS**

SIZE (W X H X INSTALLED LENGTH)	90.2" X 59.4" X 30.7" (2291 mm X 1509 mm X 781 mm)
END CAP STORAGE	35.7 CUBIC FEET (1.01 m <sup>3</sup> )
MINIMUM INSTALLED STORAGE*	108.7 CUBIC FEET (3.08 m <sup>3</sup> )
WEIGHT	135.0 lbs. (61.2 kg)

\*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

## MC-4500 TECHNICAL SPECIFICATIONS

NOT TO SCALE

## SITE DEVELOPMENT PLANS

TAX MAP 52 LOT 112A

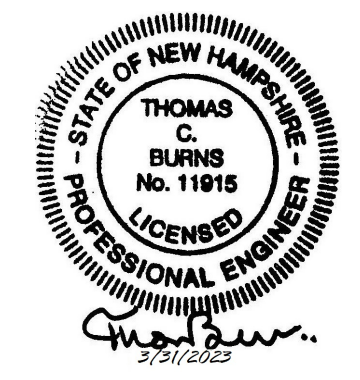
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SCALE: NTS

FEBRUARY 28, 2023



REV	DATE	DESCRIPTION	DR	CK	TCB
1	3/31/2023	REVISED PER EXETER TRC REVIEW	JD	TCB	

45659-51	DR	JED	FB	-
	CK	TCB	CADFILE	45659-51 COVER AND DETAILS



Civil Engineers  
Structural Engineers  
Traffic Engineers  
Land Surveyors  
Landscape Architects  
Scientists

48 Constitution Drive  
Bedford, NH 03110  
Phone (603) 472-4488  
Fax (603) 472-9747  
www.tfmoran.com

Mar 31, 2023 - 11:42am WFM-BEDFORD\Projects\Civil-Survey\TFM Projects\45659-51 Wakefield Thermal - Exeter NH\45659-51 Cover and Details.dwg

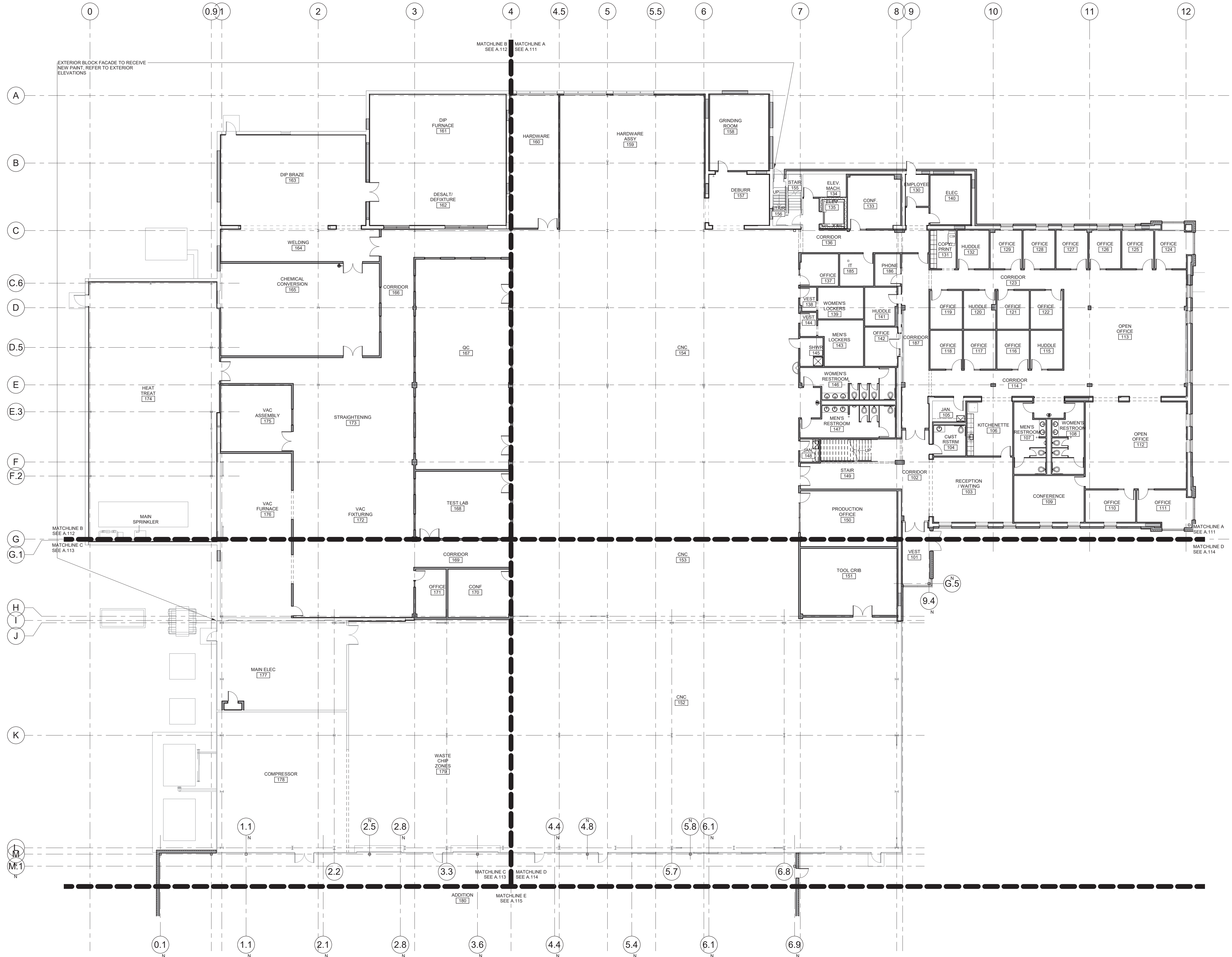
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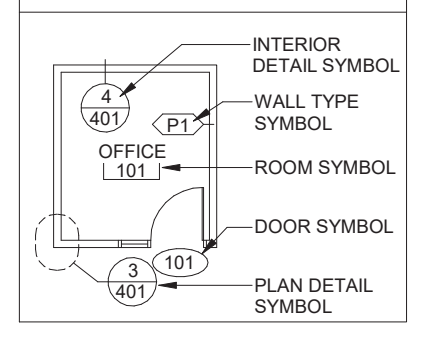






**Notes:**

**ARCHITECTURAL FLOOR PLAN REFERENCE SYS.**



**PARTITION LEGEND**

[Symbol]	EXISTING WALL, VERIFY CONSTRUCTION IN FIELD
[Symbol]	NEW INTERIOR PARTITION
[Symbol]	CMU WALL

- PARTITION NOTES**
1. ALL WALLS NOT KEYED IN BY WALL TYPE DESIGNATION TO BE PARTITION "P" - TYP
  2. REPAIR EXISTING WALLS AS REQUIRED WHERE ADJACENT WALLS WERE REMOVED
  3. GC TO REVIEW CONDITION OF EXISTING TO REMAIN WALLS WITH TENANT/OWNER

- DIMENSION NOTES**
1. INTERIOR PARTITIONS ARE DIMENSIONED TO THE CENTERLINE, UON
  2. EXTERIOR MASONRY WALLS ARE DIMENSIONED TO THE FACE OF MASONRY
  3. INTERIOR MASONRY WALLS ARE DIMENSIONED TO THE FACE OF MASONRY

**ABBREVIATION LEGEND**

CR	CARD READER LOCATION
MS	MOTION SENSOR LOCATION
PB	PB RELEASE LOCATION
CJ	CONTROL JOINT LOCATION, REFER TO A 621 FOR DETAIL, ALIGN WITH EDGE OF DOOR/WINDOW FRAME WHERE POSSIBLE

- KEYNOTES**
1. INFILL OPENING WITH STUDS, DRYWALL AND INSULATION
  2. INFILL OPENING WITH BLOCK, REFER TO ELEVATIONS AND STRUCTURAL DRAWINGS
  3. PROVIDE IN-WALL BLOCKING FOR WALL MOUNTED TVS, CENTER ON WALL UON, CENTER AT 5'-6" AFF UON
  4. REPAIR DAMAGED DRYWALL
  5. CONFIRM EXISTING WALLS ARE 1HR RATED, IF NOT CONVERT TO WALL TYPE F51, FIRESEAL ALL PENETRATIONS

**FIRE EXTINGUISHER SCHEDULE**

FE-1	SURFACE MOUNT FIRE EXTINGUISHER, JL INDUSTRIES; PLASTIC SIGN # 245 BY JL INDUSTRIES TO BE MOUNTED ABOVE EXTINGUISHER
FE-2	RECESSED FIRE EXTINGUISHER - 1-1/2" TRIM, JL INDUSTRIES; ACADEMY SERIES; CABINET #1826G17, LDCVRFE LETTERS, WHITE POWDER-COAT FINISH, REFER TO DETAIL A.622; PLASTIC SIGN # 245 BY JL INDUSTRIES TO BE MOUNTED ABOVE CABINET

Key Plan:

Stamp:

Project:  
**C/A Design**  
 131 Portsmouth Avenue  
 Exeter, NH 03833

Client:  
 C/A Design  
 180 Crosby Road  
 Dover, NH 03820  
 (603) 748-5991  
 ahp Project #: 22047  
 Scale: As Noted

Issue: \_\_\_\_\_ Date: \_\_\_\_\_  
 75% Construction Documents 02.23.23

Revisions:

	Date:

Drawing Title:  
 FIRST FLOOR PLAN  
 Sheet Number:

**A.101**

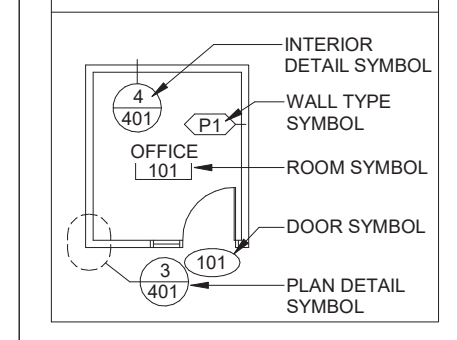
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 116 John Street, Suite 115, Lowell, Ma. 01852  
 Tel: (978) 244-1100  
 www.ahparchitects.com

1 FIRST FLOOR PLAN  
 SCALE: 3/32" = 1'-0"



**Notes:**

**ARCHITECTURAL FLOOR PLAN REFERENCE SYS.**



**PARTITION LEGEND**

[Symbol]	EXISTING WALL, VERIFY CONSTRUCTION IN FIELD
[Symbol]	NEW INTERIOR PARTITION
[Symbol]	CMU WALL

**PARTITION NOTES**

1. ALL WALLS NOT KEYED IN BY WALL TYPE DESIGNATION TO BE PARTITION "P" TYPE
2. REPAIR EXISTING WALLS AS REQUIRED WHERE ADJACENT WALLS WERE REMOVED
3. GC TO REVIEW CONDITION OF EXISTING TO REMAIN WALLS WITH TENANT/ OWNER

**DIMENSION NOTES**

1. INTERIOR PARTITIONS ARE DIMENSIONED TO THE CENTERLINE, UON
2. EXTERIOR MASONRY WALLS ARE DIMENSIONED TO THE FACE OF MASONRY
3. INTERIOR MASONRY WALLS ARE DIMENSIONED TO THE FACE OF MASONRY

**ABBREVIATION LEGEND**

CR	CARD READER LOCATION
MS	MOTION SENSOR LOCATION
PB	PB RELEASE LOCATION
CJ	CONTROL JOINT LOCATION, REFER TO A.621 FOR DETAIL, ALIGN WITH EDGE OF DOOR/WINDOW FRAME WHERE POSSIBLE

**KEYNOTES**

1. INFILL OPENING WITH STUDS, DRYWALL AND INSULATION
2. INFILL OPENING WITH BLOCK, REFER TO ELEVATIONS AND STRUCTURAL DRAWINGS
3. PROVIDE IN-WALL BLOCKING FOR WALL MOUNTED TVS, CENTER ON WALL UON, CENTER AT 5'-6" AFF UON
4. REPAIR DAMAGED DRYWALL
5. CONFIRM EXISTING WALLS ARE 1HR RATED, IF NOT CONVERT TO WALL TYPE FS1, FIRESEAL ALL PENETRATIONS

**FIRE EXTINGUISHER SCHEDULE**

FE-1	SURFACE MOUNT FIRE EXTINGUISHER, JL INDUSTRIES; PLASTIC SIGN # 245 BY JL INDUSTRIES TO BE MOUNTED ABOVE EXTINGUISHER
FE-2	RECESSED FIRE EXTINGUISHER - 1-1/2" TRIM, JL INDUSTRIES; ACADEMY SERIES CABINET #1826G17, LDCVRFE LETTERS, WHITE POWDER-COAT FINISH, REFER TO DETAIL A.622; PLASTIC SIGN # 245 BY JL INDUSTRIES TO BE MOUNTED ABOVE CABINET

**Key Plan:**

**Stamp:**

**Project:**  
**C/A Design**  
 131 Portsmouth Avenue  
 Exeter, NH 03833

**Client:**  
 C/A Design  
 180 Crosby Road  
 Dover, NH 03820  
 (603) 748-5991  
 ahp Project #: 22047  
 Scale: As Noted

**Issue:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
 75% Construction Documents 02.23.23

**Revisions:**


**Drawing Title:**  
 MEZZANINE PLAN

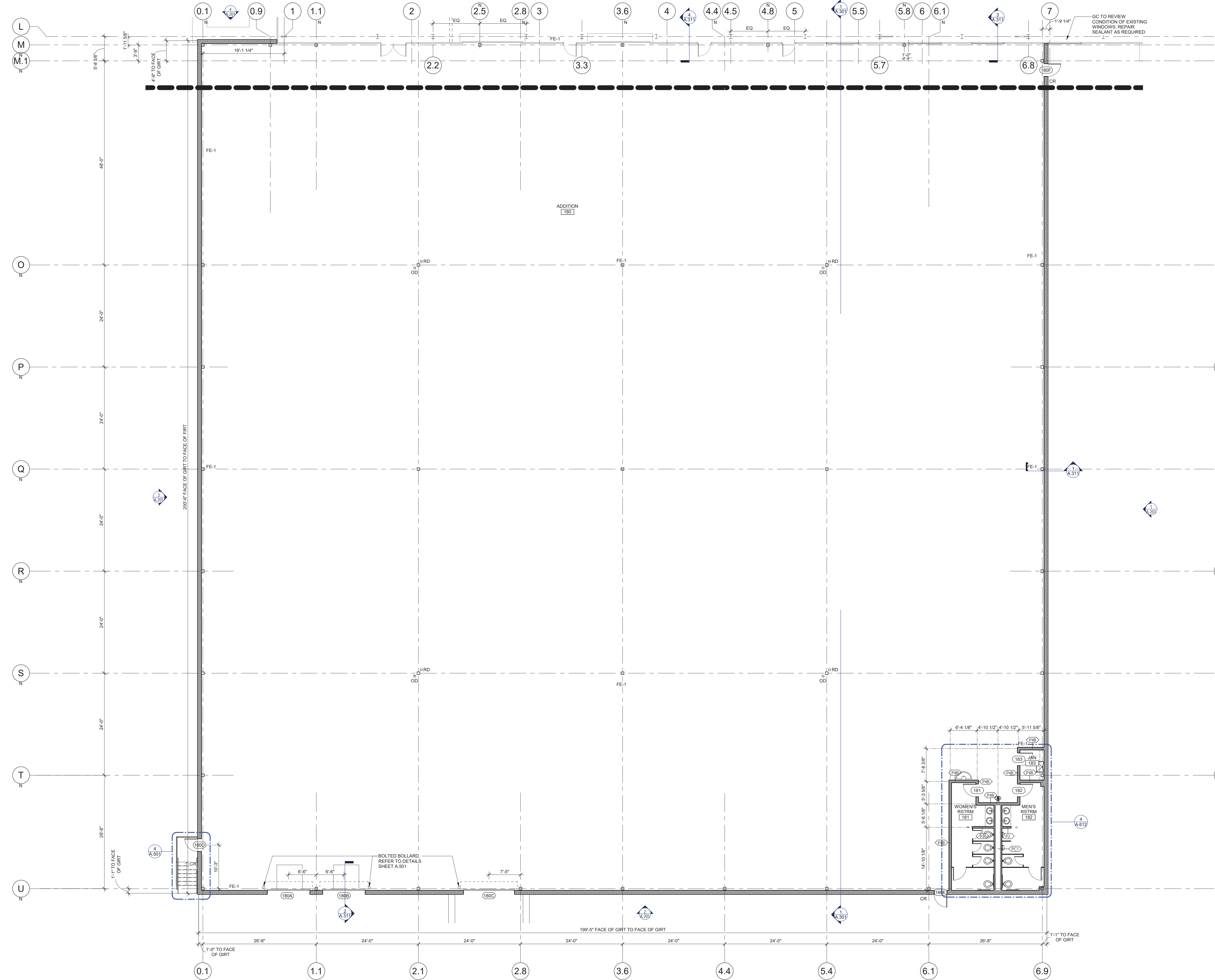
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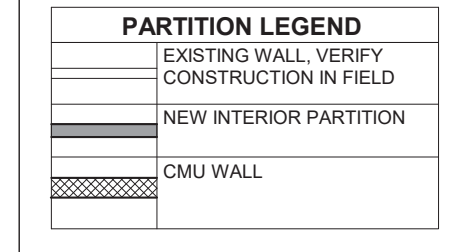
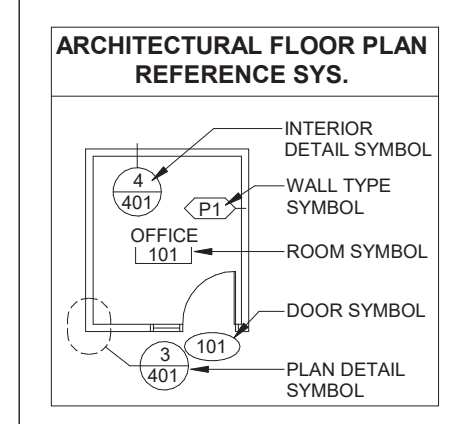
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1 MEZZANINE PLAN  
 SCALE: 3/32" = 1'-0"

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**Notes:**



**PARTITION NOTES**

1. ALL WALLS NOT KEYED IN BY WALL TYPE DESIGNATION TO BE PARTITION "PBR" TYPE
2. REPAIR EXISTING WALLS AS REQUIRED WHERE ADJACENT WALLS WERE REMOVED
3. GC TO REVIEW CONDITION OF EXISTING TO REMAIN WALLS WITH TENANT/OWNER

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**Key Plan:**

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**C/A Design**  
 131 Portsmouth Avenue  
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**Client:**  
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 180 Crosby Road  
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 (603) 748-5991  
 ahp Project #: 22047  
 Scale: As Noted

**Issue:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
 75% Construction Documents 02.23.23

**Revisions:**


**Drawing Title:**  
 ADDITION PLAN

**Sheet Number:**

**A.115**

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1 PARTIAL FIRST FLOOR ADDITION PLAN  
 SCALE: 1/8" = 1'-0"

**Notes:**

**EXTERIOR WINDOW FRAMING & GLAZING**

- GENERAL WINDOW NOTES:**  
 1. ALL DIMENSIONS SHOWN ON ARCHITECTURAL DRAWINGS ARE ROUGH OPENINGS. SHOP DRAWINGS SHOULD REFLECT APPROPRIATE FRAME SIZES INCLUDING JOINT SIZES PER MANUFACTURERS SPECIFICATIONS  
 2. GC/SUB-CONTRACTOR TO FIELD VERIFY ALL OPENINGS PRIOR TO FABRICATION OF WINDOWS.  
 3. SUBMIT COLOR SAMPLES FOR FRAMES AND GLAZING AS PART OF THE SHOP DRAWING PROCESS.

**STOREFRONT SYSTEM:**

1. KAWNEER 4511 - FRONT GLAZED  
 2. FRAME COLOR - CLEAR ANODIZED ALUMINUM

**CURTAIN WALL SYSTEM:**

1. KAWNEER 1000 SYSTEM - 7-1/2" FRAME DEPTH  
 2. STEEL REINFORCING TO BE FABRICATOR DURING SHOP DRAWINGS AS REQUIRED TO MEET MANUFACTURER'S SPECIFICATIONS AND WIND LOAD REQUIREMENTS  
 3. FRAME COLOR - CLEAR ANODIZED ALUMINUM.

**ENTRANCES:**

1. DOORS: KAWNEER 350 MEDIUM STILE

**GLAZING:**

1. ALL GLAZING TO BE LOW E-II  
 2. PROVIDE TEMPERED GLAZING IN ALL AREA REQUIRED BY CODE.  
 3. GLAZING COLORS (PILKINGTON):

- G1: 1" INSULATED ECLIPSE ADVANTAGE (LOW E)  
 -14" ARCTIC BLUE ECLIPSE ADVANTAGE (LOW E SURFACE #2)  
 -12" AIR SPACE  
 -14" CLEAR ANNEALED, TEMPERED WHERE REQUIRED

- G2: 1" INSULATED ECLIPSE ADVANTAGE (LOW E) SPANDREL:  
 -14" ARCTIC BLUE ECLIPSE ADVANTAGE (LOW E REFLECTIVE SURFACE #2)  
 -12" AIR SPACE  
 -14" CLEAR ANNEALED, TEMPERED WHERE REQUIRED (WARM GRAY SPANDREL COATING SURFACE #4)

**Key Plan:**

**Stamp:**

**Project:**

**C/A Design**  
 131 Portsmouth Avenue  
 Exeter, NH 03833

**Client:**  
 C/A Design  
 180 Crosby Road  
 Dover, NH 03820  
 (603) 748-5981

**ahp Project #:** 22047

**Scale:** As Noted

<b>Issue:</b>	<b>Date:</b>
75% Construction Documents	02.23.23

<b>Revisions:</b>	<b>Date:</b>

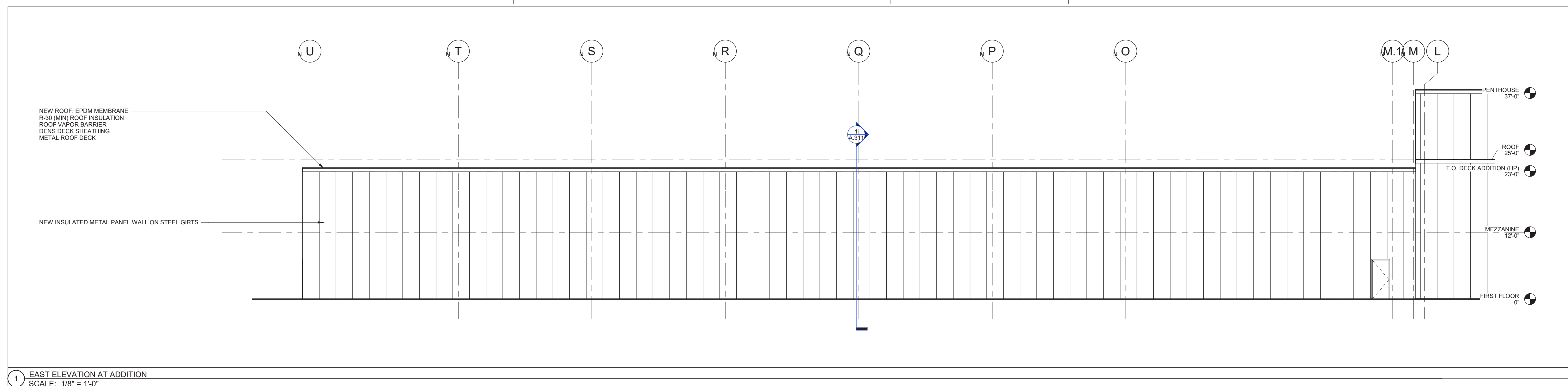
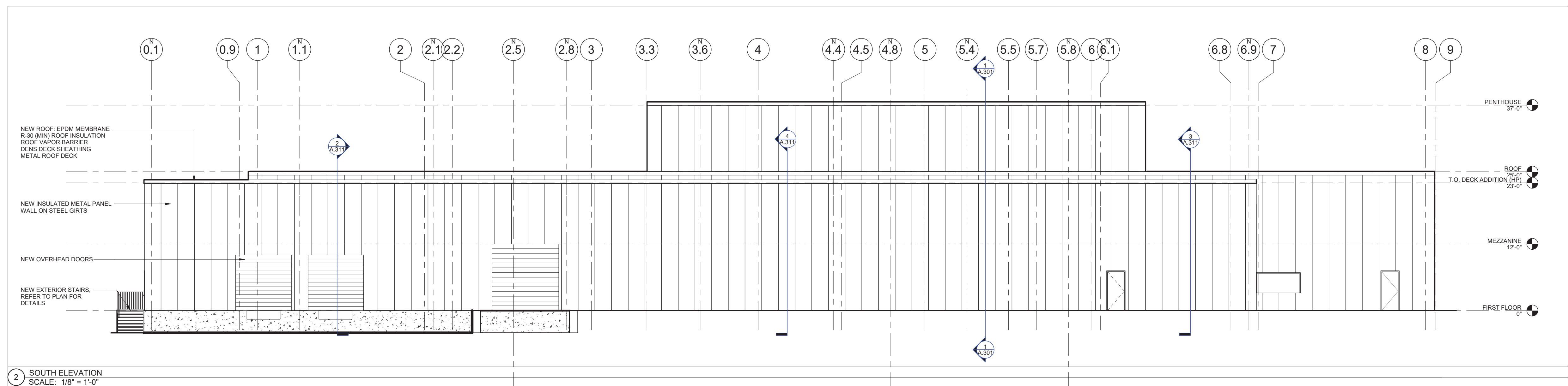
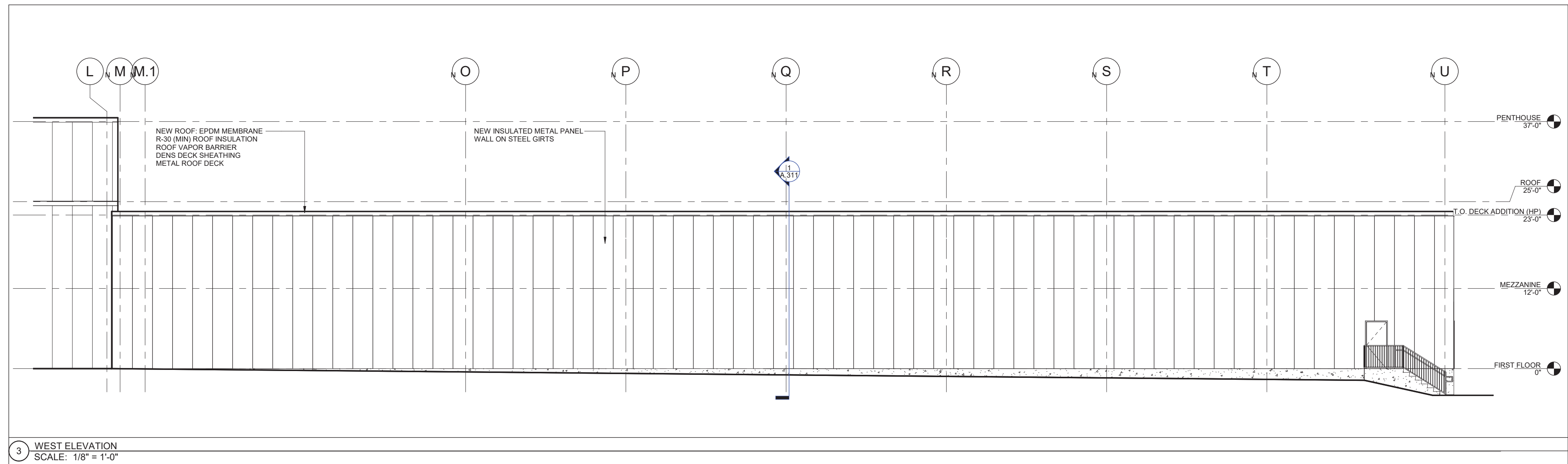
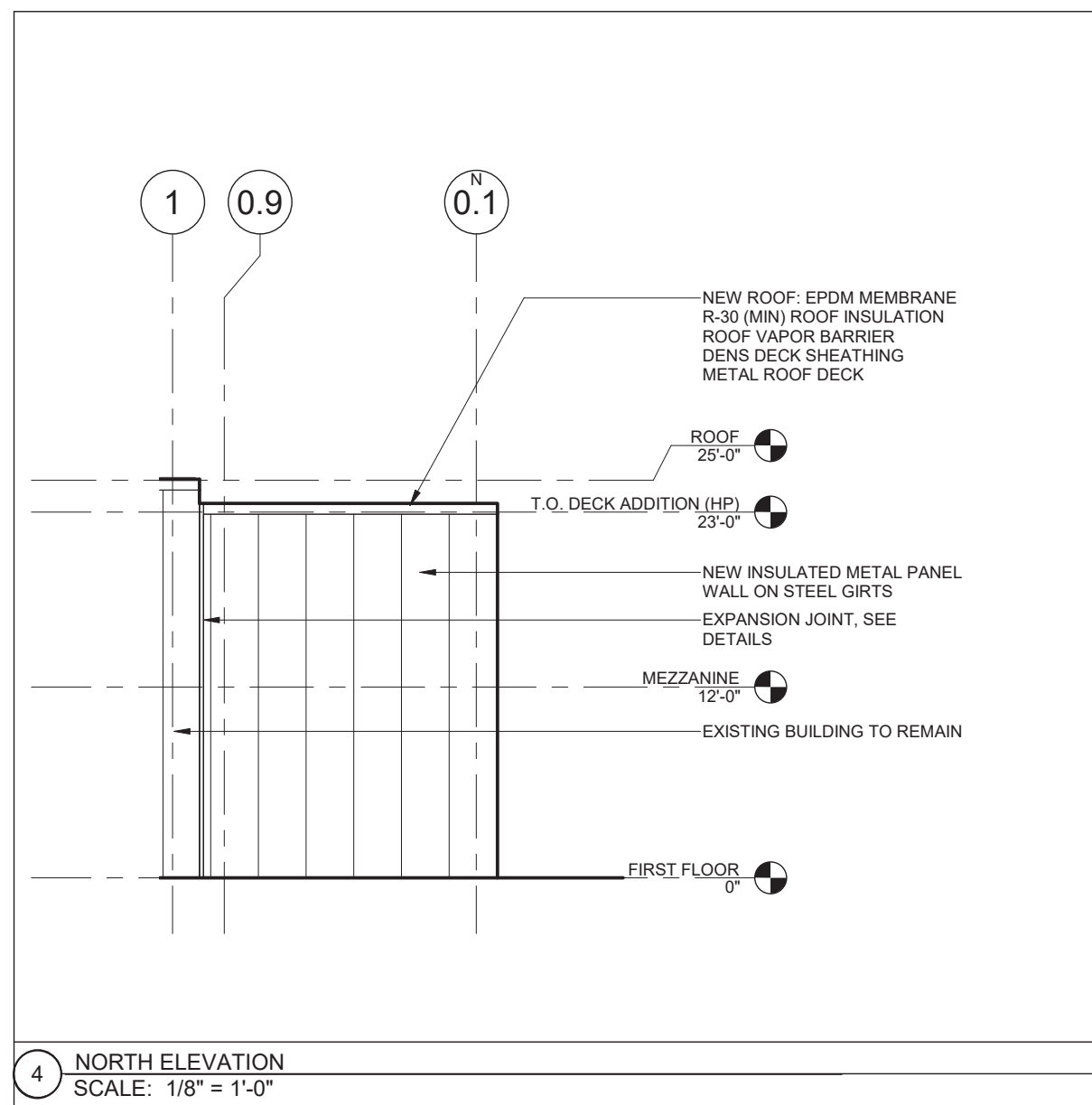
**Drawing Title:**  
 EXTERIOR ELEVATIONS AT ADDITION

**Sheet Number:**

**A.201**

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# STORMWATER MANAGEMENT REPORT

C/A Design, Inc.

Manufacturing Warehouse

**Tax Map 52 Lot 112A**

**131 Portsmouth Avenue**

**Exeter, NH**

*Prepared On:*

February 28, 2023

*Revised March 31, 2023*

*Prepared for:*

**C/A Design, Inc.**

**(Wakefield Thermal, Inc.)**

120 Northwest Blvd

Nashua, NH 03063

Job Number:

45659-51

*Prepared by:*

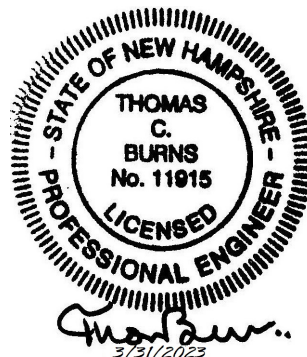


Civil Engineers  
Structural Engineers  
Traffic Engineers  
Land Surveyors  
Landscape Architects  
Scientists

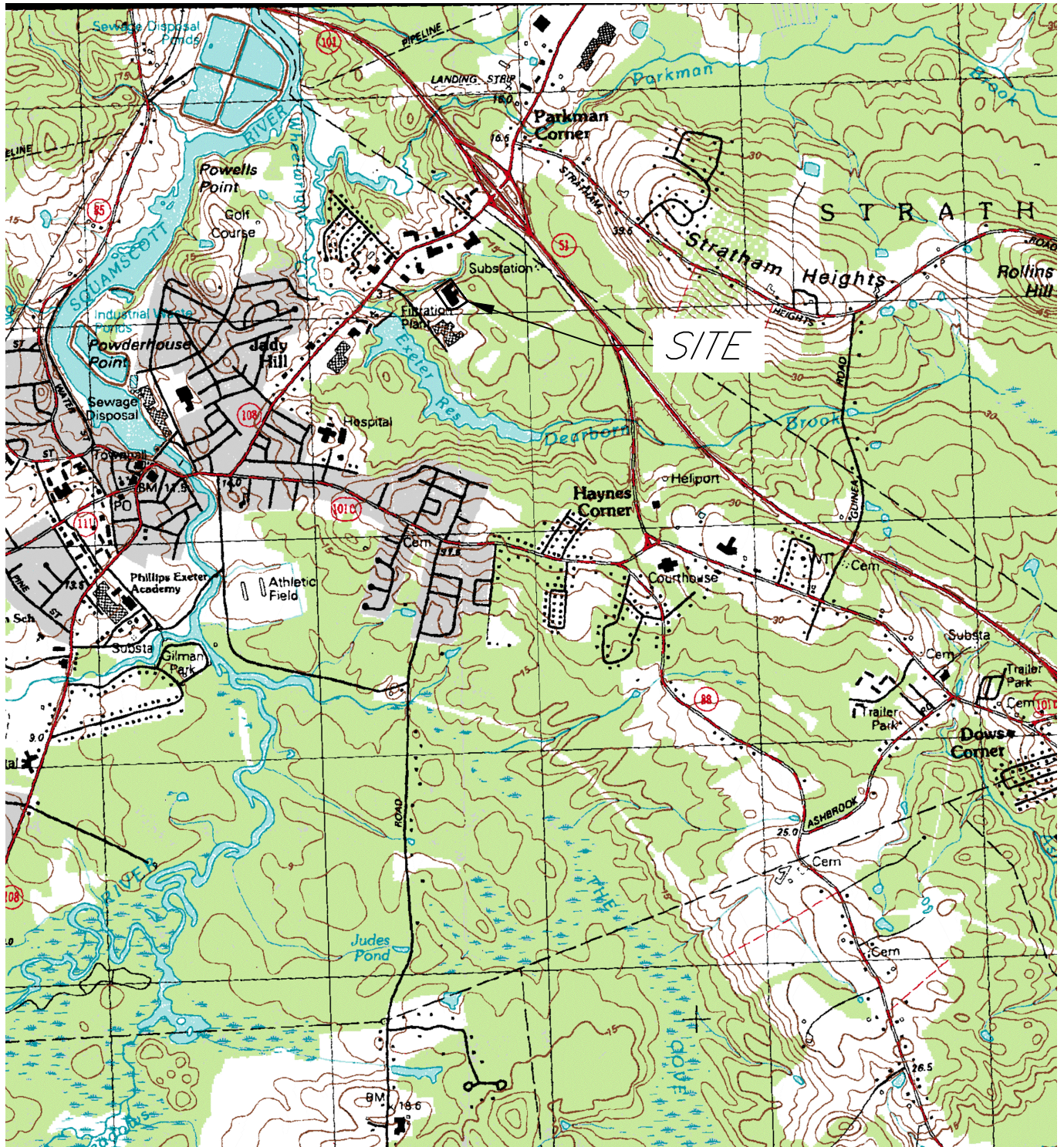
48 Constitution Drive, Bedford, NH 03110

Tel: (603) 472-4488 Fax: (603) 472-9747

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**USGS LOCUS MAP**

**SCALE: 1"=2000'**



Civil Engineers  
Structural Engineers  
Traffic Engineers  
Land Surveyors  
Landscape Architects  
Scientists

48 Constitution Drive  
Bedford, NH 03110  
Phone (603) 472-4488  
Fax (603) 472-9747  
www.tfmoran.com

TAX MAP 52 LOT 112-A

**WAKEFIELD  
THEMRAL  
EXETER, NH**

PREPARED FOR:  
**WAKEFIELD THERMAL  
NAHSUA, NH**

FILE	45659.51	DATE	2023-01-37	SHEET 1 OF 1
		CADFILE	45659-51DRAINAGE	



# ALTERATION OF TERRAIN PERMIT APPLICATION



Water Division/ Alteration of Terrain Bureau/ Land Resources Management  
Check the Status of your Application: [www.des.nh.gov/onestop](http://www.des.nh.gov/onestop)

RSA/ Rule: RSA 485-A:17, Env-Wq 1500

Administrative Use Only	Administrative Use Only	Administrative Use Only	File Number:
			Check No.
			Amount:
			Initials:

<b>1. APPLICANT INFORMATION (INTENDED PERMIT HOLDER)</b>			
Applicant Name: C/A Design Inc.		Contact Name: Matt Van Zile c/o Wakefield Thermal	
Email: mvanzile@wakefield-vette.com		Daytime Telephone:	
Mailing Address: 120 Northwest Blvd.			
Town/City: Nashua		State: NH	Zip Code: 03063
<b>2. APPLICANT'S AGENT INFORMATION</b> If none, check here: <input checked="" type="checkbox"/>			
Business Name:		Contact Name:	
Email:		Daytime Telephone:	
Address:			
Town/City:		State:	Zip Code:
<b>3. PROPERTY OWNER INFORMATION (IF DIFFERENT FROM APPLICANT)</b>			
Applicant Name: NH Exeter Properties, LLC		Contact Name: Matt Van Zile c/o Wakefield Thermal	
Email: mvanzile@wakefield-vette.com		Daytime Telephone:	
Mailing Address: 70 W. Madison St, Suite 5600			
Town/City: Chicago		State: IL	Zip Code: 60602
<b>4. PROPERTY OWNER'S AGENT INFORMATION</b> If none, check here: <input checked="" type="checkbox"/>			
Business Name:		Contact Name:	
Email:		Daytime Telephone:	
Address:			
Town/City:		State:	Zip Code:
<b>5. CONSULTANT INFORMATION</b> If none, check here: <input type="checkbox"/>			
Engineering Firm: TFMoran, Inc.		Contact Name: Thomas C. Burns, P.E.	
Email: tburns@tfmoran.com		Daytime Telephone: 603-472-4488	
Address: 48 Constitution Drive			
Town/City: Bedford		State: NH	Zip Code: 03110

**6. PROJECT TYPE**

- Excavation Only  
  Residential  
  Commercial  
  Golf Course  
  School  
  Municipal  
 Agricultural  
  Land Conversion  
  Other: Industrial

**7. PROJECT LOCATION INFORMATION**

Project Name: C/A Design, Inc. Exeter Expansion

Street/Road Address: 131 Portsmouth Avenue

Town/City: Exeter

County: Rockingham

Tax Map: 52

Block:

Lot Number: 112-A

Unit:

Location Coordinates: 42.98768N, 70.93033W

Latitude/Longitude

UTM

State Plane

Post-development, will the proposed project withdraw from or directly discharge to any of the following? If yes, identify the purpose.

1. Stream or Wetland Purpose:	<input type="checkbox"/> Yes	<input type="checkbox"/> Withdrawal	<input type="checkbox"/> Discharge
	<input checked="" type="checkbox"/> No		
2. Man-made pond created by impounding a stream or wetland Purpose:	<input type="checkbox"/> Yes	<input type="checkbox"/> Withdrawal	<input type="checkbox"/> Discharge
	<input checked="" type="checkbox"/> No		
3. Unlined pond dug into the water table Purpose:	<input type="checkbox"/> Yes	<input type="checkbox"/> Withdrawal	<input type="checkbox"/> Discharge
	<input checked="" type="checkbox"/> No		

Post-development, will the proposed project discharge to:

- A surface water impaired for phosphorus and/or nitrogen?  No    Yes - include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen
- A Class A surface water or Outstanding Resource Water?  No    Yes - include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen
- A lake or pond not covered previously?  No    Yes - include information to demonstrate that project will not cause net increase in phosphorus in the lake or pond

Is the project a High Load area?  Yes    No

If yes, specify the type of high load land use or activity: \_\_\_\_\_

Is the project within a Water Supply Intake Protection Area (WSIPA)?

Yes    No

Is the project within a Groundwater Protection Area (GPA)?

Yes    No

Will the well setbacks identified in Env-Wq 1508.02 be met?

Yes    No

Note: Guidance document titled "[Using NHDES's OneStop WebGIS to Locate Protection Areas](#)" is available online. For more details on the restrictions in these areas, read Chapter 3.1 in Volume 2 of the NH Stormwater Manual.

Is any part of the property within the 100-year floodplain?  Yes    No

If yes: Cut volume: \_\_\_\_\_ cubic feet within the 100-year floodplain

Fill volume: \_\_\_\_\_ cubic feet within the 100-year floodplain

Project IS within ¼ mile of a designated river   Name of River: \_\_\_\_\_

Project is NOT within ¼ mile of a designated river

Project IS within a Coastal/Great Bay Region community - include info required by Env-Wq 1503.08(l) if applicable

Project is NOT within a Coastal/Great Bay Region community

**8. BRIEF PROJECT DESCRIPTION (PLEASE DO NOT REPLY "SEE ATTACHED")**

**9. IF APPLICABLE, DESCRIBE ANY WORK STARTED PRIOR TO RECEIVING PERMIT**

No.

**10. ADDITIONAL REQUIRED INFORMATION**

A. Date a copy of the application was sent to the municipality as required by Env-Wq 1503.05(e)<sup>1</sup>: 3/23/2023.

**(Attach proof of delivery)**

B. Date a copy of the application was sent to the local river advisory committee if required by Env-Wq 1503.05(e)<sup>2</sup>:  / / .

**(Attach proof of delivery)**

C. Type of plan required:  Land Conversion  Detailed Development  Excavation, Grading & Reclamation  Steep Slope

D. Additional plans required:  Stormwater Drainage & Hydrologic Soil Groups  Source Control  Chloride Management

E. Total area of disturbance: 257,004 square feet

F. Additional impervious cover as a result of the project: 116,232 square feet (use the "-" symbol to indicate a net reduction in impervious coverage).

Total final impervious cover: 248,397 square feet

G. Total undisturbed cover: 76,742 square feet

H. Number of lots proposed: 1

I. Total length of roadway: 0 linear feet

J. Name(s) of receiving water(s): 0

K. Identify all other NHDES permits required for the project, and for each indicate whether an application has been filed and is pending, or if the required approval has been issued provide the permit number, registration date, or approval letter number, as applicable.

Type of Approval	Application Filed?	Status	
		Pending	If Issued:
1. Water Supply Approval	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/>	Permit number:
2. Wetlands Permit	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/>	Permit number:
3. Shoreland Permit	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/>	Permit number:
4. UIC Registration	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/>	Registration date:
5. Large/Small Community Well Approval	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/>	Approval letter date:
6. Large Groundwater Withdrawal Permit	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/>	Permit number:
7. Other:	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	Permit number:

L. List all species identified by the Natural Heritage Bureau as threatened or endangered or of concern: None Identified

M. Using NHDES's Web GIS OneStop program ([www2.des.state.nh.us/gis/onestop/](http://www2.des.state.nh.us/gis/onestop/)), with the Surface Water Impairment layer turned on, list the impairments identified for each receiving water. If no pollutants are listed, enter "N/A."  
N/A

N. Did the applicant/applicant's agent have a pre-application meeting with AOT staff?  Yes  No  
If yes, name of staff member:

O. Will blasting of bedrock be required?  Yes  No If yes, estimated quantity of blast rock: \_\_\_\_\_ cubic yards  
If yes, standard blasting BMP notes must be placed on the plans, available at:  
<http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-10-12.pdf>

**NOTE:** If greater than 5,000 cubic yards of blast rock will be generated, a groundwater monitoring program must be developed and submitted to NHDES. Contact AOT staff for additional detail.

<sup>1</sup> Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the governing body of each municipality in which the project is proposed.

<sup>2</sup> Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the Local River Advisory Committee, if the project is within ¼ mile of a designated river.

**11. CHECK ALL APPLICATION ATTACHMENTS THAT APPLY (SUBMIT WITH APPLICATION IN ORDER LISTED)****LOOSE:**

- Signed application form: [des.nh.gov/organization/divisions/water/aot/index.htm](http://des.nh.gov/organization/divisions/water/aot/index.htm) (with attached proof(s) of delivery)
- Check for the application fee: [des.nh.gov/organization/divisions/water/aot/fees.htm](http://des.nh.gov/organization/divisions/water/aot/fees.htm)
- Color copy of a USGS map with the property boundaries outlined (1" = 2,000' scale)
- If Applicant is not the property owner, proof that the applicant will have a legal right to undertake the project on the property if a permit is issued to the applicant.

**BIND IN A REPORT IN THE FOLLOWING ORDER:**

- Copy of the signed application form & application checklist ([des.nh.gov/organization/divisions/water/aot/index.htm](http://des.nh.gov/organization/divisions/water/aot/index.htm))
- Copy of the check
- Copy of the USGS map with the property boundaries outlined (1" = 2,000' scale)
- Narrative of the project with a summary table of the peak discharge rate for the off-site discharge points
- Web GIS printout with the "Surface Water Impairments" layer turned on - <http://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx>
- Web GIS printouts with the AOT screening layers turned on - <http://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx>
- NHB letter using DataCheck Tool – [www.nhdf.org/about-forests-and-lands/bureaus/natural-heritage-bureau/](http://www.nhdf.org/about-forests-and-lands/bureaus/natural-heritage-bureau/)
- The Web Soil Survey Map with project's watershed outlined – [websoilsurvey.nrcs.usda.gov](http://websoilsurvey.nrcs.usda.gov)
- Aerial photograph (1" = 2,000' scale with the site boundaries outlined)
- Photographs representative of the site
- Groundwater Recharge Volume calculations (one worksheet for each permit application): [des.nh.gov/organization/divisions/water/aot/documents/bmp\\_worksh.xls](http://des.nh.gov/organization/divisions/water/aot/documents/bmp_worksh.xls)
- BMP worksheets (one worksheet for each treatment system): [des.nh.gov/organization/divisions/water/aot/documents/bmp\\_worksh.xls](http://des.nh.gov/organization/divisions/water/aot/documents/bmp_worksh.xls)
- Drainage analysis, stamped by a professional engineer (see Application Checklist for details)
- Riprap apron or other energy dissipation or stability calculations
- Site Specific Soil Survey report, stamped and with a certification note prepared by the soil scientist that the survey was done in accordance with the Site Specific Soil Mapping standards, *Site-Specific Soil Mapping Standards for NH & VT, SSSNNE Special Publication No. 3*.
- Infiltration Feasibility Report (example online) [Env-Wq 1503.08(f)(3)]
- Registration and Notification Form for Storm Water Infiltration to Groundwater (UIC Registration-for underground systems only, including drywells and trenches): [http://des.nh.gov/organization/divisions/water/dwgb/dwspp/gw\\_discharge](http://des.nh.gov/organization/divisions/water/dwgb/dwspp/gw_discharge)
- Inspection and maintenance manual with, if applicable, long term maintenance agreements [Env-Wq 1503.08(g)]
- Source control plan

**PLANS:**

- One set of design plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)
- Pre & post-development color coded soil plans on 11" x 17" (see Application Checklist for details)
- Pre & post-development drainage area plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)

**100-YEAR FLOODPLAIN REPORT:**

- All information required in Env-Wq 1503.09, submitted as a separate report.

**ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE**

- See Checklist for Details

- REVIEW APPLICATION FOR COMPLETENESS & CONFIRM INFORMATION LISTED ON THE APPLICATION IS INCLUDED WITH SUBMITTAL.**

**12. REQUIRED SIGNATURES**

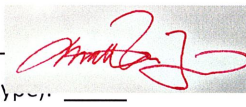
TCB By initialing here, I acknowledge that I am required by Env-Wq 1503.20(e) to submit a copy of all approved documents to the department in PDF format on a CD within one week after permit approval.

By signing below, I certify that:

- The information contained in or otherwise submitted with this application is true, complete, and not misleading to the best of my knowledge and belief;
- I understand that the submission of false, incomplete, or misleading information constitutes grounds for the department to deny the application, revoke any permit that is granted based on the information, and/or refer the matter to the board of professional engineers established by RSA 310-A:3 if I am a professional engineer; and
- I understand that I am subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641.

**APPLICANT**

**APPLICANT'S AGENT:**

Signature: \_\_\_\_\_ 

Name (print or type): \_\_\_\_\_


Digitally signed by Matt Van Zile  
 DN: cn=Matt Van Zile gn=Matt Van Zile c=US United States l=US United States ou=Wakefield Thermal Solutions  
 e=mvanzile@wakefieldthermal.com  
 Date: 2023-03-16 10:21:04:00

Date: \_\_\_\_\_

Title: \_\_\_\_\_

**PROPERTY OWNER**

**PROPERTY OWNER'S AGENT:**

Signature: \_\_\_\_\_ 

Name (print or type): \_\_\_\_\_

Digitally signed by Matt Van Zile  
 DN: cn=Matt Van Zile gn=Matt Van Zile c=US United States l=US United States ou=Wakefield Thermal Solutions  
 e=mvanzile@wakefieldthermal.com  
 Date: 2023-03-16 10:23:04:00

Date: \_\_\_\_\_

Title: \_\_\_\_\_

## ATTACHMENT A: ALTERATION OF TERRAIN PERMIT APPLICATION CHECKLIST

Check the box to indicate the item has been provided or provide an explanation why the item does not apply.

### DESIGN PLANS

- Plans printed on 34 - 36" by 22 - 24" white paper
- PE stamp
- Wetland delineation
- Temporary erosion control measures
- Treatment for all stormwater runoff from impervious surfaces such as roadways (including gravel roadways), parking areas, and non-residential roof runoff. Guidance on treatment BMPs can be found in Volume 2, Chapter 4 of the NH Stormwater Management Manual.
- Pre-existing 2-foot contours
- Proposed 2-foot contours
- Drainage easements protecting the drainage/treatment structures
- Compliance with the Wetlands Bureau, RSA 482- A <http://des.nh.gov/organization/divisions/water/wetlands/index.htm>. Note that artificial detention in wetlands is not allowed.
- Compliance with the Comprehensive Shoreland Protection Act, RSA 483-B. <http://des.nh.gov/organization/divisions/water/wetlands/cspa>
- Benches. Benching is needed if you have more than 20 feet change in elevation on a 2:1 slope, 30 feet change in elevation on a 3:1 slope, 40 feet change in elevation on a 4:1 slope.
- Check to see if any proposed ponds need state Dam permits.  
<http://des.nh.gov/organization/divisions/water/dam/documents/damdef.pdf>

### DETAILS

- Typical roadway x-section
- Detention basin with inverts noted on the outlet structure
- Stone berm level spreader
- Outlet protection – riprap aprons
- A general installation detail for an erosion control blanket
- Silt fences or mulch berm
- Storm drain inlet protection. Note that since hay bales must be embedded 4 inches into the ground, they are not to be used on hard surfaces such as pavement.
- Hay bale barriers
- Stone check dams
- Gravel construction exit
- Temporary sediment trap
- The treatment BMP's proposed
- Any innovative BMP's proposed

[ridge.mauck@des.nh.gov](mailto:ridge.mauck@des.nh.gov) or (603) 271-2147

NHDES Alteration of Terrain Bureau, PO Box 95, Concord, NH 03303-0095

[www.des.nh.gov](http://www.des.nh.gov)

**CONSTRUCTION SEQUENCE/EROSION CONTROL**

- Note that the project is to be managed in a manner that meets the requirements and intent of RSA 430:53 and Chapter Agr 3800 relative to invasive species.
- Note that perimeter controls shall be installed prior to earth moving operations.
- Note that temporary water diversion (swales, basins, etc) must be used as necessary until areas are stabilized.
- Note that ponds and swales shall be installed early on in the construction sequence (before rough grading the site).
- Note that all ditches and swales shall be stabilized prior to directing runoff to them.
- Note that all roadways and parking lots shall be stabilized within 72 hours of achieving finished grade.
- Note that all cut and fill slopes shall be seeded/loamed within 72 hours of achieving finished grade
- Note that all erosion controls shall be inspected weekly AND after every half-inch of rainfall.
- Note the limits on the open area allowed, see Env-Wq 1505.02 for detailed information.

Example note: The smallest practical area shall be disturbed during construction, but in no case shall exceed 5 acres at any one time before disturbed areas are stabilized.

- Note the definition of the word "stable"

Example note: An area shall be considered stable if one of the following has occurred:

- Base course gravels have been installed in areas to be paved.
- A minimum of 85 percent vegetated growth has been established.
- A minimum of 3 inches of non-erosive material such stone or riprap has been installed.
- Or, erosion control blankets have been properly installed.

- Note the limit of time an area may be exposed  
Example note: All areas shall be stabilized within 45 days of initial disturbance.

- Provide temporary and permanent seeding specifications. (Reed canary grass is listed in the Green Book; however, this is a problematic species according to the Wetlands Bureau and therefore should not be specified)

- Provide winter construction notes that meet or exceed our standards.

**Standard Winter Notes:**

- All proposed vegetated areas that do not exhibit a minimum of 85 percent vegetative growth by October 15, or which are disturbed after October 15, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting, elsewhere. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events.
- All ditches or swales which do not exhibit a minimum of 85 percent vegetative growth by October 15, or which are disturbed after October 15, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions.
- After October 15, incomplete road or parking surfaces, where work has stopped for the winter season, shall be protected with a minimum of 3 inches of crushed gravel per NHDOT item 304.3.

- Note at the end of the construction sequence that "Lot disturbance, other than that shown on the approved plans, shall not commence until after the roadway has the base course to design elevation and the associated drainage is complete and stable." – This note is applicable to single/duplex family subdivisions, when lot development is not part of the permit.

**DRAINAGE ANALYSES**

[ridge.mauck@des.nh.gov](mailto:ridge.mauck@des.nh.gov) or (603) 271-2147

NHDES Alteration of Terrain Bureau, PO Box 95, Concord, NH 03303-0095

[www.des.nh.gov](http://www.des.nh.gov)



Please double-side 8 ½" × 11" sheets where possible but, **do not** reduce the text such that more than one page fits on one side.

- PE stamp
- Rainfall amount obtained from the Northeast Regional Climate Center- <http://precip.eas.cornell.edu/>. Include extreme precipitation table as obtained from the above referenced website.
- Drainage analyses, in the following order:
  - Pre-development analysis: Drainage diagram.
  - Pre-development analysis: Area Listing and Soil Listing.
  - Pre-development analysis: Node listing 1-year (if applicable), 2-year, 10-year and 50-year.
  - Pre-development analysis: Full summary of the 10-year storm.
  - Post-development analysis: Drainage diagram.
  - Post-development analysis: Area Listing and Soil Listing.
  - Post-development analysis: Node listing for the 2-year, 10-year and 50-year.
  - Post-development analysis: Full summary of the 10-year storm.
- Review the Area Listing and Soil Listing reports
  - Hydrologic soil groups (HSG) match the HSGs on the soil maps provided.
  - There is the same or less HSG A soil area after development (check for each HSG).
  - There is the same or less "woods" cover in the post-development.
  - Undeveloped land was assumed to be in "good" condition.
  - The amount of impervious cover in the analyses is correct.

Note: A good check is to subtract the total impervious area used in the pre analysis from the total impervious area used in the post-analysis. For residential projects without demolition occurring, a good check is to take this change in impervious area, subtract out the roadway and divide the remaining by the number of houses/units proposed. Do these numbers make sense?

- Check the storage input used to model the ponds.
- Check to see if the artificial berms pass the 50-year storm, i.e., make sure the constructed berms on ponds are not overtopped.
- Check the outlet structure proposed and make sure it matches that modeled.
- Check to see if the total areas in the pre and post analyses are same.
- Confirm the correct NRCS storm type was modeled (Coos, Carroll & Grafton counties are Type II, all others Type III).

#### **PRE- AND POST-DEVELOPMENT DRAINAGE AREA PLANS**

- Plans printed on 34 - 36" by 22 - 24" on white paper.
- Submit these plans separate from the soil plans.
- A north arrow.
- A scale.
- Labeled subcatchments, reaches and ponds.
- Tc lines.
- A clear delineation of the subcatchment boundaries.
- Roadway station numbers.
- Culverts and other conveyance structures.

#### **PRE AND POST-DEVELOPMENT COLOR-CODED SOIL PLANS**

- 11" x 17" sheets suitable, as long as it is readable.
- Submit these plans separate from the drainage area plans.
- A north arrow.
- A scale.
- Name of the soil scientist who performed the survey and date the soil survey took place.
- 2-foot contours (5-foot contours if application is for a gravel pit) as well as other surveyed features.
- Delineation of the soil boundaries and wetland boundaries.
- Delineation of the subcatchment boundaries.
- Soil series symbols (e.g., 26).
- A key or legend which identifies each soil series symbol and its associated soil series name (e.g., 26 = Windsor).
- The hydrologic soil group color coding (A = Green, B = yellow, C= orange, D=red, Water=blue, & Impervious = gray).

**Please note that excavation projects (e.g., gravel pits) have similar requirements to that above, however the following are common exceptions/additions:**

- Drainage report is not needed if site does not have off-site flow.
- 5 foot contours allowed rather than 2 foot.
- No PE stamp needed on the plans.
- Add a note to the plans that the applicant must submit to the Department of Environmental Services a written update of the project and revised plans documenting the project status every five years from the date of the Alteration of Terrain permit.
- Add reclamation notes.

See NRCS publication titled: *Vegetating New Hampshire Sand and Gravel Pits* for a good resource, it is posted online at: <http://des.nh.gov/organization/divisions/water/aot/categories/publications>.

**ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE**

- If project will discharge stormwater to a surface water impaired for phosphorus and/or nitrogen, include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen.
- If project will discharge stormwater to a Class A surface water or Outstanding Resource Water, include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen.
- If project will discharge stormwater to a lake or pond not covered previously, include information to demonstrate that project will not cause net increase in phosphorus in the lake or pond.
- If project is within a Coastal/Great Bay Region community, include info required by Env-Wq 1503.08(l) if applicable.

# Wakefield Thermal Manufacturing Warehouse

131 Portsmouth Avenue (GTE Road), Exeter, NH 03833

February 28, 2023

Revised March 28<sup>th</sup>, 2023

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Diagram  
Area & Soil Listings  
Node Listing: 2-yr, 10-yr, 25-yr, 50-yr (Per AoT)  
Full Summary: 10-yr (per AoT)

#### **Part 5 Post-Development Drainage Analysis**

Post-development HydroCAD Calculations  
Diagram  
Area & Soil Listings  
Node Listing: 2-yr, 10-yr, 25-yr, 50-yr (Per AoT)  
Full Summary: 10-yr (per AoT)

#### **Part 6 Inspection and Maintenance Manual**

Inspection & Maintenance Manual  
Contech Jellyfish Filter Addendum

#### **Part 7 Drainage Plans**

Drainage Plan (11x17)  
Soils Plan (11x17)  
Pre-development – Sheet 1 of 2  
Post-development – Sheet 2 of 2

Pre-development & Post-development Drainage Plans (Full size in pocket)

## Executive Summary

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C/A Design, Inc. is proposing to renovate and expand an existing vacant manufacturing warehouse located at 131 Portsmouth Avenue in Exeter, New Hampshire. In addition to a proposed building expansion, the project incorporates various site improvements including access, stormwater management, landscaping, site grading, parking, and upgraded utilities. The project site, located on GTE Road in Exeter, NH – next to the OSRAM building and Hannaford Super Market, lies within the Tax Map 52, Lot 112A and is approximately 9 +/- acres. The site spans two zoning districts: 1) The Corporate/Technology Park (CT) and the Highway Commercial (C-2). The property is abutted by those zoning districts, CT to the Southeast (OSRAM) and C-2 to the Northwest (Hannaford).

A closed drainage system is being proposed for the development with a Stormtech Subsurface Detention System and Contech water treatment units with associated catch basins and conveyance practices to provide pretreatment, treatment, and attenuate flows.

The system has been designed to maintain peak flows during all storm events up to and including a 50-year storm event.

- Best Management Practices are proposed to manage the stormwater from the development and provide treatment, recharge, and to maintain existing hydrology;
- There is no increase on the peak rate of runoff at the discharge points from the project site;
- The Water Quantity Volume (WQV) has been met by providing the required storage below the lowest orifice of the systems;
- The proposal provides for the removal of at least 80% of Total Suspended Solids (TSS) and 60% removal of Total Phosphorous and Total Nitrogen.

## Description of Project

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The project parcel is currently a vacant lot with an existing (abandoned) building, paved parking and utilities. There are several easements bisecting the lot in various locations including drainage, water works, access, sewer and electric (please refer to the pre-development drainage map for location of the easements).

The project proposes to construct a 40,000 sf addition to the existing building and improve the site access, parking, stormwater management, utilities and landscaping on the parcel. The use of the building is intended to be manufacturing and warehousing. A variance was granted for the non-conforming use of this parcel by the Exeter Zoning Board of Adjustment on September 20<sup>th</sup>, 2022.

Existing stormwater discharge points will be maintained throughout the site. About 90% of the watershed area drains to a wetland complex located north of the site.

The existing lot is 9 +/- acres and approximately 5.8 +/- acres will be disturbed as a part of the project.

A NHDES Alteration of Terrain Permit, NHDES Sewer Connection, NHDES Wetlands Minor and Town Site Plan approval will be required for the site development project.

The objectives for the post-development drainage design are to use best management practices to attenuate the flow, provide pretreatment and treatment to collected stormwater and maintain groundwater recharge where practical.

The intent of this report is: 1) to analyze the rate of runoff from the site for the pre-development conditions and for the post-development conditions. The drainage system will be designed to maintain the current peak rate of runoff from the site, and 2) to provide storm water pretreatment and treatment from the development prior to discharging runoff from the site in accordance with the requirements of the State of New Hampshire and the Town of Exeter.

## Storm Water Methodology

### Rainfall Intensity

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The below table lists the rainfall data used to model storms in HydroCAD, as collected from the Northeast Regional Climate Center (NRCC).

#### 24-Hour Rainfall Intensity

	Northeast Regional Climate Center	+15% Used to Model
2-year	3.22 inches	<b>3.70 inches</b>
10-year	4.91 inches	<b>5.65 inches</b>
25-year	6.25 inches	<b>7.19 inches</b>
50-year	7.50 inches	<b>8.63 inches</b>

### Pre-Development Conditions

Based on the existing topography and property lines, a 10.42+/- acre watershed area has been defined to analyze the hydrology of the site. Ten watershed subcatchment areas and three design discharge points have been defined. Discharge point L-F represents the point where runoff leaves the site to the Northeast corner of the site and by overland flow enters the Route 88 (Holland Way) Right-of-Way. A small portion of the northeast corner of the site is tributary to this point. Discharge point L-E represents the point where runoff leaves the site in the southeast corner of the site and by overland flow enters the OSRAM property (Tax Map 52 Lot 112-1) via a wetland ditch. Some of the paved parking and woodland from lot 52-112-1 as well as the southernmost portion of the project parcel are tributary to this discharge point. Discharge point L-D represents the point where discharge from 90% of the watershed area drains to in the pre-development condition. This point is a wetland complex with steep side slopes from the site draining into it. The existing roof, grass areas, pavement, and some woodland are tributary to this point. Most of the front lawn and paved areas of the site are routed through closed drainage to a different wetland to receive treatment prior to being discharged to the larger wetland (terminal discharge point). The roof and some of the paved areas are routed via a 15" CMP to the wetland. There are five (5) man made wetland pockets on site. Two (2) of the wetlands will be filled (A & B), two (2) of the wetlands will be partially impacted (F & G) and one of the wetlands (C) will be left intact.

There are existing drainage easements that will be modified to accommodate the new addition, however pipe sizing and discharge points for the flow through the easements will be maintained.

Test pits were performed as part of the project design. The depth to seasonal high groundwater was obtained and used in the design of the system.

The Natural Resources Conservation Service's Web Soil Survey was utilized to determine the off-site soil characteristics while a NH Soil Scientist mapped the onsite soils generating a Site Specific Soil Map.

To model the site drainage, the HydroCAD Version 10.00 program has been used. The software is based on the SCS TR-20 technique used for modeling the hydrology and hydraulics of storm water runoff. The 2-year, 5-year, 10-year, 25-year, and 50-year calculations are included per NHDES and Town of Exeter requirements.

### **Post-Development Conditions**

The runoff from proposed impervious areas has been routed to best emulate pre-development conditions at the discharge points after receiving treatment.

For all impervious areas of the site, a series of catch basins and a closed drainage network are being proposed to capture surface runoff. This network will route the runoff to a singular subsurface detention system which will pretreat and treat the stormwater to a pollutant concentration acceptable to be discharged by the Town and State authority. Before runoff enters the proposed Stormtech chamber system, two Contech Jellyfish Peak Flow Rate Diversion units will receive the first flush of pollutant laden water to enhance the removal of TSS, TP, and TN. This system will treat runoff from all proposed impervious areas including, driveways, parking areas, new roofs, and sidewalks and will be located beneath the loading and parking area adjacent to the proposed building addition. Two catch basins will be linked to the systems to route the stormwater into the chambers. These catch basins will also double as inspection ports into the system for inspections and maintenance. The system will ultimately drain to an outlet structure attached to the system near the proposed building addition. This structure will then be linked to the existing drainage network and flow to the discharge point at the top of the site.

The objectives for the post-development drainage design are to use best management practices to attenuate the flow and provide pre-treatment and treatment to collected stormwater..

The post-development drainage model represents the site divided into multiple subcatchments based on the layout of the proposed stormwater collection system.

All pre-development discharge points have been analyzed in post-development conditions.

### **Groundwater Recharge**

The required Groundwater Recharge (GRV) for the soils that have been replaced by impervious cover per the Alteration of Terrain regulations is 2,908 cubic feet based on the NHDES BMP worksheet. Due to the restrictive layers and high groundwater on site, recharge is not being proposed by the stormwater management system. Data is provided on the GRV and BMP Worksheet section of this report.



## **Stormwater Treatment**

Best Management Practices are proposed to manage the stormwater from the development, provide treatment, and maintain existing flow rates leaving the site.

Filtration and treatment systems are being proposed to remove pollutants, reduce the peak rates of flow and reduce flow volume by storing and controlling the release of the treated water. The stormwater receives treatment as it percolates through the filter media allowing for filtration and absorption by the organic matter and mineral complexes. The design provides for the removal of at least 80% of Total Suspended Solids (TSS) and 60% removal of Total Phosphorous and Total Nitrogen.

The Water Quality Volume (WQV) is detained completely within the Stormtech filtration system while providing storm water treatment.

## **Erosion Control Measures**

Erosion Control Measures are found on the Storm Water Management Plan within the plan set. The erosion control notes and construction sequence notes on the Detail Sheets contain specifications for stabilizing disturbed areas and limiting the length of time these areas are exposed.

## **Temporary Erosion Control Measures**

Silt Sock or a stump grindings berm is proposed along the edges of down slope site work to prevent sediment from leaving the project area. A stabilized construction entrance is proposed at the driveway entrance to keep sediment from being tracked onto the street during construction. Catch basin erosion protection is also proposed to keep sediment out of the closed drainage system until the site is stabilized.

## **Permanent Erosion Control Measures**

All disturbed areas shall be stabilized prior to notice of termination. An closed drainage system is proposed on the site to capture the runoff from the project.

## **Flood Protection**

Examination of the Flood Insurance Rate Map for the Town of Exeter, New Hampshire, Community Panel Number 33015C046E, Effective Date: May 17, 2005, indicates that the proposed work is not located within a 100-year flood hazard area.

## Conclusion

### Peak Rate Flows

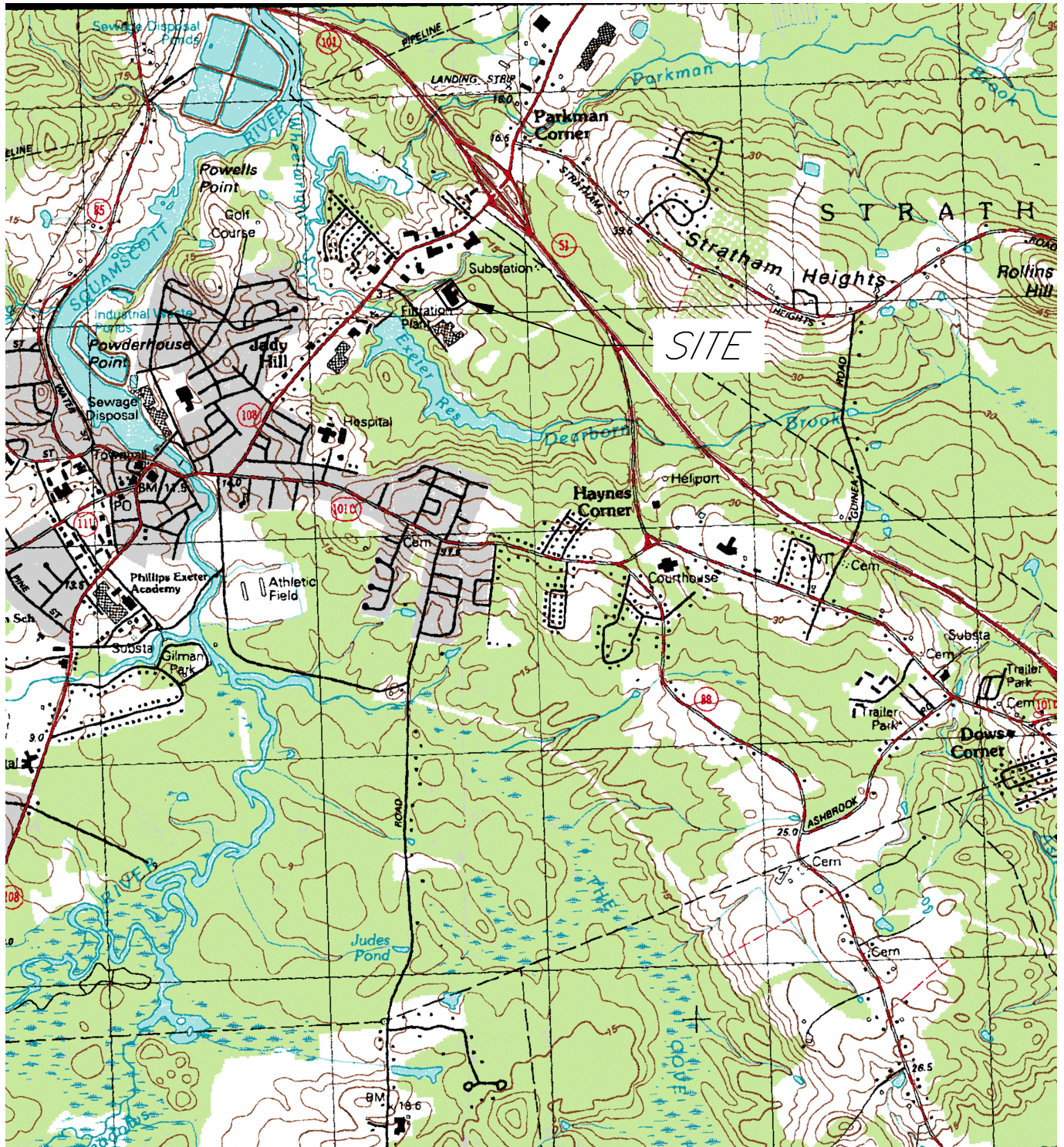
There is no increase in the off-site peak rate of runoff from the project site.

FLOW (CFS)	1-YR	2-YR		10-YR		25-YR		50-YR	
	Pre	Pre	Post	Pre	Post	Pre	Post	Pre	Post
L-D	5.0	6.7	6.7	15.5	11.4	23.1	15.9	30.7	24.1
L-E	0.1	0.5	0.5	1.3	1.0	2.1	1.5	2.9	2.0
L-F	0.3	0.0	0.0	0.2	0.2	0.4	0.4	0.6	0.5

VOLUME (AF)	2-YR	
	Pre	Post
L-D	0.96	0.96
L-E	0.01	0.01
L-F	0.06	0.05

### Treatment

The Stormtech subsurface stormwater chambers combined with the Jellyfish treatment units meet or exceed removal of 80% TSS, 60% TP, and 60% TN, as required by the Town of Exeter's Stormwater Management Standards. The systems meet both the pre-treatment and treatment standards set forth by the State of New Hampshire's water treatment qualifications (Env-Wq 1505) and have been historically used for development in New Hampshire.



**USGS LOCUS MAP**

**SCALE: 1"=2000'**



Civil Engineers  
 Structural Engineers  
 Traffic Engineers  
 Land Surveyors  
 Landscape Architects  
 Scientists

48 Constitution Drive  
 Bedford, NH 03110  
 Phone (603) 472-4488  
 Fax (603) 472-9747  
 www.tfmoran.com

TAX MAP 52 LOT 112-A

**WAKEFIELD  
 THEMRAL  
 EXETER, NH**

PREPARED FOR:  
**WAKEFIELD THERMAL  
 NAHSUA, NH**

FILE	45659.51	DATE	2023-01-37	SHEET 1 OF 1
		CADFILE	45659-51DRAINAGE	



## AERIAL LOCUS MAP

**SCALE: 1"=500'**



Civil Engineers  
Structural Engineers  
Traffic Engineers  
Land Surveyors  
Landscape Architects  
Scientists

48 Constitution Drive  
Bedford, NH 03110  
Phone (603) 472-4488  
Fax (603) 472-9747  
[www.tfmoran.com](http://www.tfmoran.com)

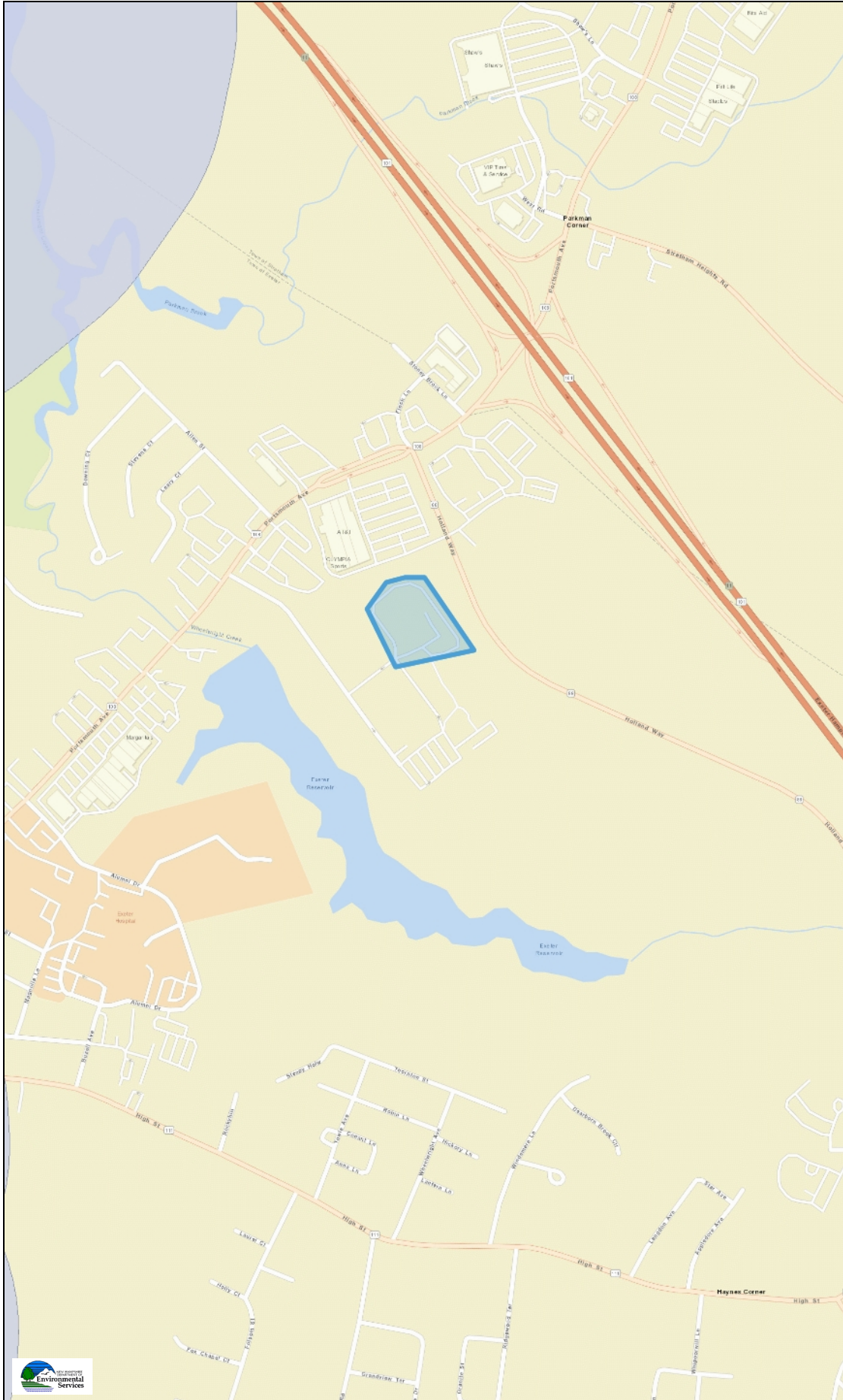
TAX MAP 52 LOT 112-A

**WAKEFIELD  
THERMAL  
EXETER, NH**


PREPARED FOR:  
**WAKEFIELD THERMAL  
NAHSUA, NH**

FILE	45659.51	DATE	2023-01-37	SHEET 1 OF 1
		CADFILE	45659-51DRAINAGE	

# Designated River Check



## Legend

-  Designated Rivers Quarter Buffer

Map Scale

1: 10,000

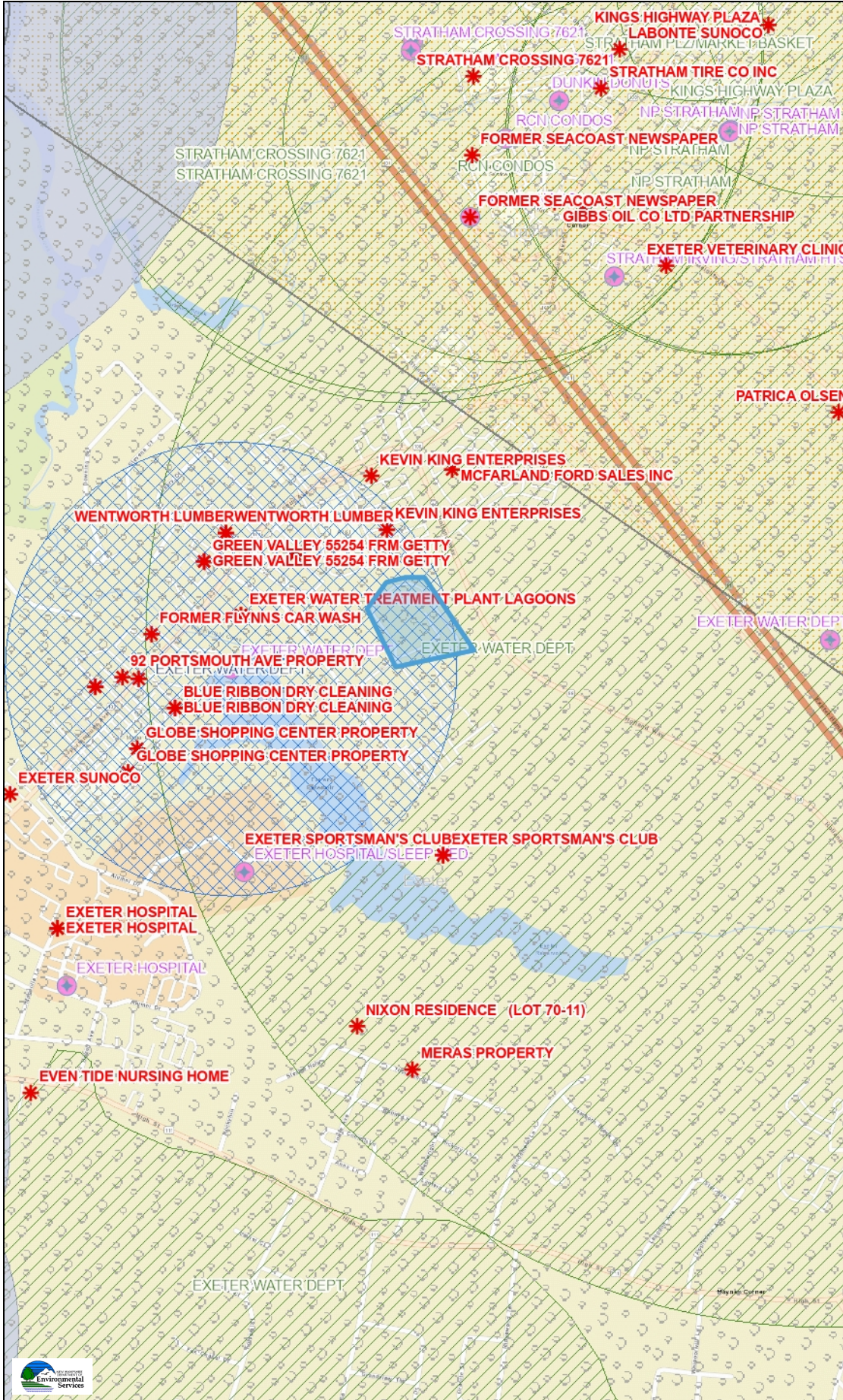
© NH DES, <http://des.nh.gov>

Map Generated: 1/27/2023



## Notes

# AoT Screening Layers



## Legend

- \* Remediation Sites
- Coastal and Great Bay Regi Communities
- Designated Rivers Quarter Buffer
- Public Water Supply Wells
- Groundwater Classification / GA1
- Groundwater Classification / GA2
- Water Supply Intake Protect Areas
- Wellhead Protection Areas

Map Scale

1: 10,000

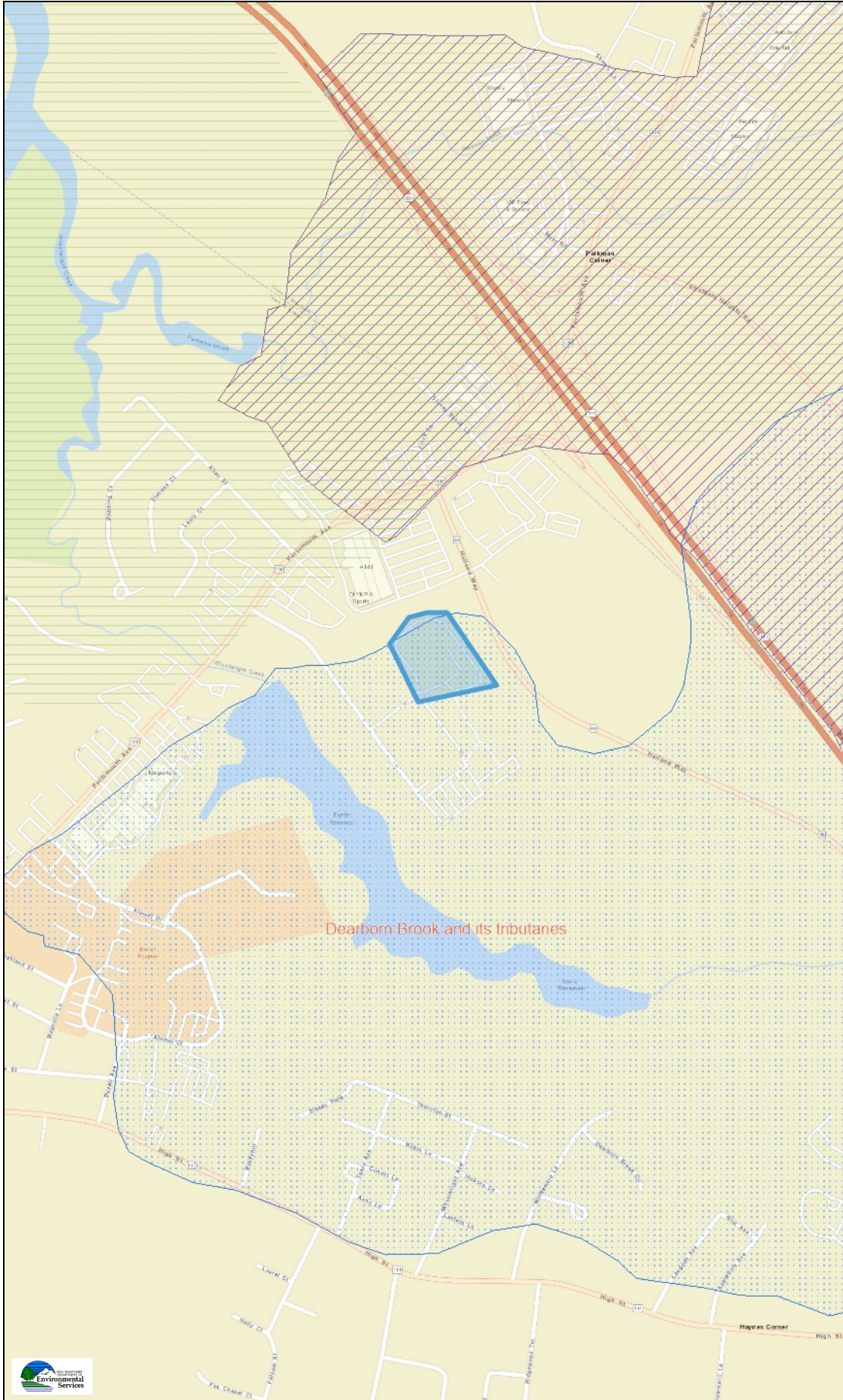
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Map Generated: 1/27/2023









## Notes

# Surface waters



## Legend

-  Surface Waters with Impairn 2022 with Quarter Mile Buffer
-  Class A Lakes with a Quarter Mile Buffer
-  Class A - All Features
-  All Lakes, with a Quarter Mile Buffer
-  Outstanding Resource Water Watersheds
-  Watersheds with Chloride Impairments

Map Scale

1: 10,000

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Map Generated: 1/27/2023



## Notes



## New Hampshire Natural Heritage Bureau NHB DataCheck Results Letter

---

**To:** Paul O'Hanlon  
48 Constitution Drive  
Bedford, NH 03110

**From:** NH Natural Heritage Bureau

**Date:** 7/21/2022 (This letter is valid through 7/21/2023)

**Re:** Review by NH Natural Heritage Bureau of request dated 7/21/2022

**Permit Type:** General Permit

**NHB ID:** NHB22-2476

**Applicant:** Paul O'Hanlon

**Location:** Exeter  
Tax Map: 52, Tax Lot: 112  
Address: 131 Portsmouth Ave

**Proj. Description:** The project will see the construction of a 40,000 sqft addition to an existing 74,00 sqft building. Construction will include associated landscaping as well as infrastructure (153 parking spaces) and start in the fall of this year (fall 2022).

The NH Natural Heritage database has been checked for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government. We currently have no recorded occurrences for sensitive species near this project area.

A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

Based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

New Hampshire Natural Heritage Bureau  
NHB DataCheck Results Letter

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**MAP OF PROJECT BOUNDARIES FOR: NHB22-2476**



Please mail the completed form and required material to:

New Hampshire Division of Historical Resources  
State Historic Preservation Office  
Attention: Review & Compliance  
19 Pillsbury Street, Concord, NH 03301-3570

RECEIVED

AUG 08 2022

RECEIVED JUL 28 2022

DHR Use Only	
R&C #	14116
Log In Date	7/28/22
Response Date	7/29/22
Sent Date	8/3/22

## Request for Project Review by the New Hampshire Division of Historical Resources

- This is a new submittal  
 This is additional information relating to DHR Review & Compliance (R&C) #:

<b>GENERAL PROJECT INFORMATION</b>
Project Title Expansion of Manufacturing Building
Project Location 131 Portsmouth Ave
City/Town Exeter Tax Map 52 Lot # 112
NH State Plane - Feet Geographic Coordinates: Easting 1181258 Northing 178571 (See RPR Instructions and R&C FAQs for guidance.)
Lead Federal Agency and Contact (if applicable) USEPA (Agency providing funds, licenses, or permits) Permit Type and Permit or Job Reference # CGP
State Agency and Contact (if applicable) Town of Exeter Permit Type and Permit or Job Reference # Site Plan Review
<b>APPLICANT INFORMATION</b>
Applicant Name Matt Van Zile
Mailing Address 120 Northwest Blvd Phone Number N/A
City Nashua State NH Zip 03063 Email mvanzile@wakefieldthermal.com
<b>CONTACT PERSON TO RECEIVE RESPONSE</b>
Name/Company Paul O'Hanlon/TFMoran Inc.
Mailing Address 48 Constitution Drive Phone Number (603)472-4488
City Bedford State NH Zip 03110 Email pohanlon@tfmoran.com

*This form is updated periodically. Please download the current form at [www.nh.gov/nhdhr/review](http://www.nh.gov/nhdhr/review). Please refer to the Request for Project Review Instructions for direction on completing this form. Submit one copy of this project review form for each project for which review is requested. **Please include a self-addressed stamped envelope.** Project submissions will not be accepted via facsimile or e-mail. This form is required. Review request form must be complete for review to begin. Incomplete forms will be sent back to the applicant without comment. Please be aware that this form may only initiate consultation. For some projects, additional information will be needed to complete the Section 106 review. All items and supporting documentation submitted with a review request, including photographs and publications, will be retained by the DHR as part of its review records. Items to be kept confidential should be clearly identified. For questions regarding the DHR review process and the DHR's role in it, please visit our website at: [www.nh.gov/nhdhr/review](http://www.nh.gov/nhdhr/review) or contact the R&C Specialist at [marika.s.labash@dncr.nh.gov](mailto:marika.s.labash@dncr.nh.gov) or 603.271.3558.*

**PROJECTS CANNOT BE PROCESSED WITHOUT THIS INFORMATION**

Project Boundaries and Description

- Attach the Project Mapping *using EMMIT or relevant portion of a 7.5' USGS Map.* (See RPR Instructions and R&C FAQs for guidance.)
- Attach a detailed narrative description of the proposed project.
- Attach a site plan. The site plan should include the project boundaries and areas of proposed excavation.
- Attach photos of the project area (overview of project location and area adjacent to project location, and specific areas of proposed impacts and disturbances.) (Informative photo captions are requested.)
- A DHR records search must be conducted to identify properties within or adjacent to the project area. Provide records search results via EMMIT or in **Table 1.** (Blank table forms are available on the DHR website.) Please note, using EMMIT Guest View for an RPR records search does not provide the necessary information needed for DHR review.  
EMMIT or in-house records search conducted on 07/21/2022.

Architecture

Are there any buildings, structures (bridges, walls, culverts, etc.) objects, districts or landscapes within the project area?  Yes  No  
If no, skip to Archaeology section. If yes, submit all of the following information:

Approximate age(s): 1974

- Photographs of *each* resource or streetscape located within the project area, with captions, along with a mapped photo key. (Digital photographs are accepted. All photographs must be clear, crisp and focused.)
- If the project involves rehabilitation, demolition, additions, or alterations to existing buildings or structures, provide additional photographs showing detailed project work locations. (i.e. Detail photo of windows if window replacement is proposed.)

Archaeology

Does the proposed undertaking involve ground-disturbing activity?  Yes  No  
If yes, submit all of the following information:

- Description of current and previous land use and disturbances.
- Available information concerning known or suspected archaeological resources within the project area (such as cellar holes, wells, foundations, dams, etc.)

**Please note that for many projects an architectural and/or archaeological survey or other additional information may be needed to complete the Section 106 process.**

**DHR Comment/Finding Recommendation** *This Space for Division of Historical Resources Use Only*

- Insufficient information to initiate review.**  Additional information is needed in order to complete review.
- No Potential to cause Effects  No Historic Properties Affected  No Adverse Effect  Adverse Effect

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*If plans change or resources are discovered in the course of this project, you must contact the Division of Historical Resources as required by federal law and regulation.*

Authorized Signature: *Nesha Mullen, DSHPO* Date: *7/29/22*

TES ENVIRONMENTAL CONSULTANTS, L.L.C.

*Environmental Planning and Permitting  
Soil and Wetlands Investigations*

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SITE-SPECIFIC  
SOIL SURVEY REPORT

*performed at*

Wakefield Thermal Site  
GTE Drive  
Tax Map 52, Lot 112-A  
Exeter, NH

*prepared for*

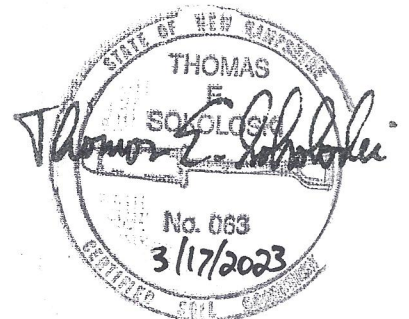
T.F. Moran, Inc.  
48 Constitution Drive  
Bedford, NH 03110

TES Project # 22-0003

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1494 Route 3A, Unit 1  
Bow, NH 03304  
(603) 856-8925

[tom@tesenviro.comcastbiz.net](mailto:tom@tesenviro.comcastbiz.net)



March 14, 2023

Mr. Thomas Burns, P.E.  
T.F. Moran, Inc.  
48 Constitution Drive  
Bedford, NH 03110

RE: Site Specific Soil Map – Wakefield Thermal Site  
GTE Drive, Exeter, NH; Tax Map 52, Lot 112-A

Dear Mr. Burns:

On February 16, 2023 I performed field work on the above-referenced property on GTE Drive in Exeter, New Hampshire for a Site Specific Soil Survey as you requested. The Soil Survey encompassed the entire 9.026-acre parcel and was depicted on an Existing Conditions Plan provided by your office. This plan had a scale of 1" = 50', and depicted contours in 2-foot intervals. The site has a large industrial building in the eastern portion of the site, with associated paved and gravel-surfaced driveways and parking/maneuvering areas. The remainder of the site is mostly maintained lawn or grassland, with mixed deciduous/evergreen forests along portions of the northeastern and southeastern sides of the site.

This Site Specific Soil Survey was completed utilizing SSSNNE Special Publication No. 3; Site Specific Soil Mapping Standards for New Hampshire and Vermont, Version 7.0, March 2021. The soil legend used for this soil map conforms to the New Hampshire State-Wide Numerical Soils Legend, Issue #10, January 2011 established and maintained by the Natural Resources Conservation Service.

Wetlands on the property were previously delineated by Jason R. Aube, CWS No, 313, of your firm. These wetlands include an undisturbed forested wetland with a stream in the northern portion of the parcel, and seep wetlands along a portion of the eastern property boundary and to the east and south of the existing site building. I observed the full extent of the wetland boundaries and fully concur with them.

On February 16, 2023, I traversed the entire site to examine numerous soil profiles via small hand-dug test pits and auger borings taken at intervals sufficient to delineate the boundaries between soil map units. I also reviewed logs from eight (8) test pits described by Paul O'Hanlon of your office on January 25, 2023 that were excavated across most of the undeveloped portions of the parcel. Numerous development features on and adjacent to the parcel, along with wetland boundary flagging, utility corridors, test pit locations, survey hubs and well-marked property boundaries provided ample locational control for the soil survey.

The NRCS Soil Survey of Rockingham County, New Hampshire was also reviewed via Web Soil Survey for reference. This NRCS mapping indicates that site soils consist of Eldridge fine sandy loam (38B) across the northern part of the parcel, with Windsor loamy sand (26B) in the southeastern portion and Udorthents, smoothed (299) located in the southwestern area. Eldridge is a moderately well drained soil formed in sandy surface deposits overlying loamy substrata

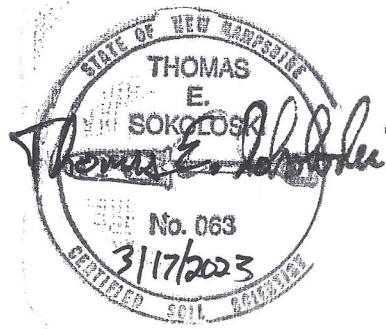
deposited in freshwater or estuarine environments. Windsor is an excessively drained soil formed in sandy glaciofluvial deposits, and Udorthents, smoothed is a disturbed soil on which the soil surface has been regraded, leaving a surface that is generally nearly level. Soil textures and drainage class may vary in the latter soil type. Based on test pit information and my observations, Udorthents, smoothed soils are generally present as shown on the NRCS mapping and in other locations, although Eldridge soils are not present (northern upland soils are well drained), nor is Windsor (soils in the eastern part of the site are predominantly loamy in texture).

The following report includes a Site Specific Soil Map Key with Hydrologic Soil Groups and attached soil map unit descriptions with typical observed soil profiles for each map unit. The general soil conditions on the site consisted of nearly level to steeply sloping, disturbed soils with fill of varying depths over estuarine deposits of silt loam. Higher land surfaces in the eastern portion of the site have soils that formed in loamy glaciofluvial deposits, with sandy loam being the predominant soil texture.

If you have any questions regarding the soils on this site and the accompanying report, please contact our office.

Very truly yours,

Thomas E. Sokoloski  
Certified Soil Scientist #063



## SITE SPECIFIC SOIL MAP UNIT KEY

Symbol*	Map Unit	Slope Class	Drainage Class	HISS Symbol	Hydro. Soil Group
24B	Agawam fine sandy loam	0-8%	Well	211BH	B
24C	Agawam fine sandy loam	8-15%	Well	211CH	B
24D	Agawam fine sandy loam	15-25%	Well	211DH	B
24E	Agawam fine sandy loam	25%+	Well	211EH	B
33B	Scitico silt loam	0-8%	Poorly	575BH	C
400B/ababb	Udorthents, sandy	0-8%	Excessively	111BH	A
400C/ababb	Udorthents, sandy	8-15%	Excessively	111CH	A
400D/ababb	Udorthents, sandy	15-25%	Excessively	111DH	A
400E/ababb	Udorthents, sandy	25%+	Excessively	111EH	A
500B/cbabb	Udorthents, loamy	0-8%	Well	261BH	B
500C/cbabb	Udorthents, loamy	8-15%	Well	261CH	B
500D/cbabb	Udorthents, loamy	15-25%	Well	261DH	B
500E/cbabb	Udorthents, loamy	25%+	Well	261EH	B
500B/dbaab	Udorthents, loamy	0-8%	Moderately well	361BH	B
500D/dbabb	Udorthents, loamy	15-25%	Moderately well	361DH	B
500B/ffccc	Udorthents, loamy	0-8%	Poorly	563BH	C
500B/hbhbb	Udorthents, loamy	0-8%	Undeterminable	761BH	B
513C	Ninigret fine sandy loam	8-15%	Moderately well	311CH	B

\* Refer to accompanying report for 5-unit supplemental symbol explanation.

This detailed Site-Specific Soil Map, prepared on February 16, 2023 by Thomas E. Sokoloski, Certified Soil Scientist #063 of TES Environmental Consultants, L.L.C. in Bow, New Hampshire, with the assistance of Paul O'Hanlon, conforms to the standards of SSSNNE Publication No. 3, Version 7.0, "Site-Specific Soil Mapping Standards for New Hampshire and Vermont", March 2021. This map has been prepared to comply with soil mapping requirements of RSA 485 A: 17 and NHDES Env-Wq 1500, Alteration of Terrain. See accompanying report for methodology, map symbol legend, and interpretations. Use of the map symbol denominators for disturbed or altered soils, where given, is at the discretion of the Certified Soil Scientist.

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for use in support of a New Hampshire Alteration Terrain permit application. It was produced by a certified Soil Scientist, and is not a product of the USDA Natural Resources Conservation Service. There is a narrative report that accompanies this map.



## **Supplemental Symbols**

The five components of the Disturbed Soil Mapping Unit Supplement are as follows:

### **Symbol 1: Drainage Class**

- a-Excessively Well Drained
- b-Somewhat Excessively Drained
- c-Well Drained
- d-Moderately Well Drained
- e-Somewhat Poorly Drained
- f-Poorly Drained
- g-Very Poorly Drained
- h-Not Determined

### **Symbol 2 -: Parent Material (of naturally formed soil only, if present)**

- a-No natural soil within 60"
- b-Glaciofluvial Deposits (outwash/terraces of sand or sand and gravel)
- c-Glacial Till Material (active ice)
- d-Glaciolacustrine very fine sand and silt deposits (glacial lakes)
- e-Loamy/sandy over silt/clay deposits
- f-Marine Silt and clay deposits (ocean waters)
- g-Alluvial Deposits (floodplains)
- h-Organic Materials-Fresh water Bogs, etc
- i- Organic Materials-Tidal Marsh

### **Symbol 3: Restrictive/Impervious Layers**

- a-None
- b-Bouldery surface with more than 15% of the surface covered with boulders
- c-Mineral restrictive layer(s) are present in the soil profile less than 40 inches below the soil surface such as hardpan, platy structure or clayey texture with consistence of at least firm, i.e. more than 20 newtons. For other examples of soil characteristics that qualify for restrictive layer, see "Soil Manual for Site evaluations in NH" 2<sup>nd</sup> Ed., page 3-17, figure 2-14
- d-Bedrock in the soil profile 0-20 inches
- e-Bedrock in the soil profile 20-60 inches
- f-Areas where depth to bedrock is so variable that a single soil type cannot be applied, will be mapped as a complex of soil types
- g-Subject to Flooding
- h -man-made impervious surface including pavement, concrete, or built-up surfaces (i.e. buildings) with no morphological restrictive layer within control section

### **Symbol 4 Estimated Ksat\* (most restrictive layer excluding symbol 3h above).**

- a- High
- b-Moderate
- c-Low
- d-Not determined

\*See "Guidelines for Ksat Class Placement" in Chapter 3 of the Soil Survey Manual, USDA

### **Symbol 5: Hydrologic Soil Group\***

- a-Group A
- b-Group B
- c-Group C
- d-Group D
- e-Not determined

\*excluding man-made impervious/restrictive layers

## SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 24

Map Unit Name: Agawam fine sandy loam

Landscape Settings: Forested or cleared outwash plains and terraces

Surface Features: None

Drainage Class: Well

Parent Material: Loamy glacial outwash deposits

Complex: Yes ( ) No (X)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

None observed.

Additional Notes:

Typical observed soil profile description:

<u>Depth</u>	<u>Horizon</u>	<u>Color</u>	<u>Texture</u>	<u>Structure</u>	<u>Consistency</u>	<u>Redox</u>	<u>Notes</u>
0-6"	Ap	10YR 2/2	Fine sandy loam	Granular	Very friable	None	Plowed
6-32"	Bw	10YR 5/6	Sandy loam	Blocky	Friable	None	
32-40"+	C	2.5Y 5/4	Sandy loam	Blocky	Friable	None	

No coarse fragments.

Tax Map 52, Lot 112-A. Locations: undisturbed soils in northern and eastern portions of site. ESHWT >40".

Thomas E. Sokoloski

February 16, 2023

## SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 33

Map Unit Name: Scitico silt loam

Landscape Settings: Low-lying forested or cleared wetlands on silty glaciolacustrine or glaciomarine deposits

Surface Features: None

Drainage Class: Poorly

Parent Material: Silty glaciolacustrine or glaciomarine deposits

Complex: Yes ( ) No (X)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

Small area of uplands along northern property line where wetland boundary was not delineated.

Additional Notes:

Typical observed soil profile description:

<u>Depth</u>	<u>Horizon</u>	<u>Color</u>	<u>Texture</u>	<u>Structure</u>	<u>Consistency</u>	<u>Redox</u>	<u>Notes</u>
0-4"	A	10YR 2/2	Fine sandy loam	Granular	Very friable	None	Plowed
4-10"	Bw	2.5Y 5/3	Sandy loam	Blocky	Friable	10YR 5/8 @6"	
10-26"+	Cg	2.5Y 5/1	Silty clay loam	Massive	Firm	10YR 5/8	

No coarse fragments.

Tax Map 52, Lot 112-A. Location: undisturbed soils in northern portion of site. ESHWT 6".

Thomas E. Sokoloski February 16, 2023

## SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 400B-E/ababb

Map Unit Name: Udorthents, sandy

Landscape Settings: Filled or regraded land surfaces

Surface Features: None

Drainage Class: Excessively to somewhat excessively

Parent Material: Sandy fill over deep, dense glaciomarine silt and clay deposits

Complex: Yes ( ) No (X)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

None observed.

Additional Notes:

Typical observed soil profile description:

<u>Depth</u>	<u>Horizon</u>	<u>Color</u>	<u>Texture</u>	<u>Structure</u>	<u>Consistency</u>	<u>Redox</u>	<u>Notes</u>
0-12"	Af	10YR 4/3	Sandy loam	Granular	Very friable	None	Fill
12-50"	Bw	10YR 5/4	Loamy sand	Single grain	Loose	None	Fill
50-60"+	Cd	2.5Y 5/1	Silty clay loam	Massive	Firm	5YR 5/6 @50"	

No coarse fragments.

Tax Map 52, Lot 112-A. Location: regraded/filled areas; disturbed soils in southern and western portions of site. ESHWT 50".

Thomas E. Sokoloski February 16, 2023

## SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 500B-E/cbabb

Map Unit Name: Udorthents, loamy

Landscape Settings: Filled or regraded land surfaces

Surface Features: Loamy fill material

Drainage Class: Well

Parent Material: Loamy fill over deep, dense glaciomarine silt and clay deposits

Complex: Yes ( ) No (X)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

None observed.

Additional Notes:

Typical observed soil profile description:

<u>Depth</u>	<u>Horizon</u>	<u>Color</u>	<u>Texture</u>	<u>Structure</u>	<u>Consistency</u>	<u>Redox</u>	<u>Notes</u>
0-12"	Af	10YR 4/3	Sandy loam	Granular	Very friable	None	Fill
12-24"	Bf	10YR 5/4	Loam	Blocky	Friable	None	Fill
24-48"	C1	2.5Y 5/4	Sandy loam	Blocky	Friable	5YR 5/8 @40"	
48-56"+	C2	2.5Y 5/1	Silty clay loam	Massive	Firm	5YR 5/8	

No coarse fragments.

Tax Map 52, Lot 112-A. Location: regraded/filled areas undisturbed soils across site. ESHWT 40".

Thomas E. Sokoloski

February 16, 2023

## SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 500B-D/dbabb  
Map Unit Name: Udorthents, loamy  
Landscape Settings: Filled or regraded land surfaces  
Surface Features: Loamy fill material  
Drainage Class: Moderately well  
Parent Material: Loamy fill over deep, dense glaciomarine silt and clay deposits  
Complex: Yes ( ) No (X)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

None observed.

Additional Notes:

Typical observed soil profile description:

<u>Depth</u>	<u>Horizon</u>	<u>Color</u>	<u>Texture</u>	<u>Structure</u>	<u>Consistency</u>	<u>Redox</u>	<u>Notes</u>
0-12"	Af	10YR 4/3	Sandy loam	Granular	Very friable	None	Fill
12-18"	Bf	10YR 5/4	Loamy sand	Single grain	Loose	None	Fill
18-36"	Bw	10YR 5/6	Fine sand	Single grain	Loose	7.5YR 5/8 @30"	
36-60"+	C	10YR 4/6	Sand	Single grain	Loose	7.5YR 5/8	

No coarse fragments.

Tax Map 52, Lot 112-A. Location: regraded/filled areas undisturbed soils across site. ESHWT 30".

Thomas E. Sokoloski February 16, 2023

## SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 500B/ffccc

Map Unit Name: Udorthents, loamy

Landscape Settings: Excavated or regraded land surfaces

Surface Features: Loamy fill material

Drainage Class: Poorly

Parent Material: Fill over dense marine silt and clay deposits

Complex: Yes ( ) No (X)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

None observed.

Additional Notes:

Typical observed soil profile description:

<u>Depth</u>	<u>Horizon</u>	<u>Color</u>	<u>Texture</u>	<u>Structure</u>	<u>Consistency</u>	<u>Redox</u>	<u>Notes</u>
0-6"	Af	10YR 2/2	Fine sandy loam	Granular	Very friable	None	Fill
6-9"	Bw	10YR 5/3	Loamy sand	Single grain	Loose	7.5YR 5/8 @6"	
9-16"	Bg	10YR 5/2	Fine sand	Single grain	Loose	7.5YR 5/8	
16-24"+	Cg	5Y 5/1	Silty clay loam	Massive	Firm	5YR 5/8	

No coarse fragments.

Tax Map 52, Lot 112-A. Location: low-lying excavated/regraded areas, wetlands; disturbed soils across site. ESHWT 6".

Thomas E. Sokoloski

February 16, 2023

## SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 500B/hbhhh

Map Unit Name: Udorthents, loamy

Landscape Settings: Developed land surfaces

Surface Features: Pavement or buildings – impervious surfaces

Drainage Class: Undeterminable (assumed to be well drained or moderately well drained based on adjacent soils without impervious surfaces)

Parent Material: Assumed to be fill over dense marine clay deposits

Complex: Yes ( ) No (X)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

None observed.

Additional Notes:

Typical observed soil profile description:

<u>Depth</u>	<u>Horizon</u>	<u>Color</u>	<u>Texture</u>	<u>Structure</u>	<u>Consistency</u>	<u>Redox</u>	<u>Notes</u>
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Soil profiles not observed due not pavement or buildings.

Tax Map 52, Lot 112-A. Location: buildings or pavement in eastern portion of parcel.  
ESHWT not determined.

Thomas E. Sokoloski February 16, 2023



## SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 513

Map Unit Name: Ninigret fine sandy loam

Landscape Settings: Lower areas on forested or cleared outwash plains and terraces

Surface Features: None

Drainage Class: Moderately well

Parent Material: Loamy glacial outwash deposits

Complex: Yes ( ) No (X)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

None observed.

Additional Notes:

Typical observed soil profile description:

<u>Depth</u>	<u>Horizon</u>	<u>Color</u>	<u>Texture</u>	<u>Structure</u>	<u>Consistency</u>	<u>Redox</u>	<u>Notes</u>
0-6"	Ap	10YR 2/2	Fine sandy loam	Granular	Very friable	None	Plowed
6-26"	Bw	10YR 5/6	Sandy loam	Blocky	Friable	None	
26-40"+	C	2.5Y 5/4	Sandy loam	Blocky	Friable	7.7YR 5/8 @30"	

No coarse fragments.

Tax Map 52, Lot 112-A. Locations: undisturbed soils in northern portion of site. ESHWT 30".

Thomas E. Sokoloski February 16, 2023



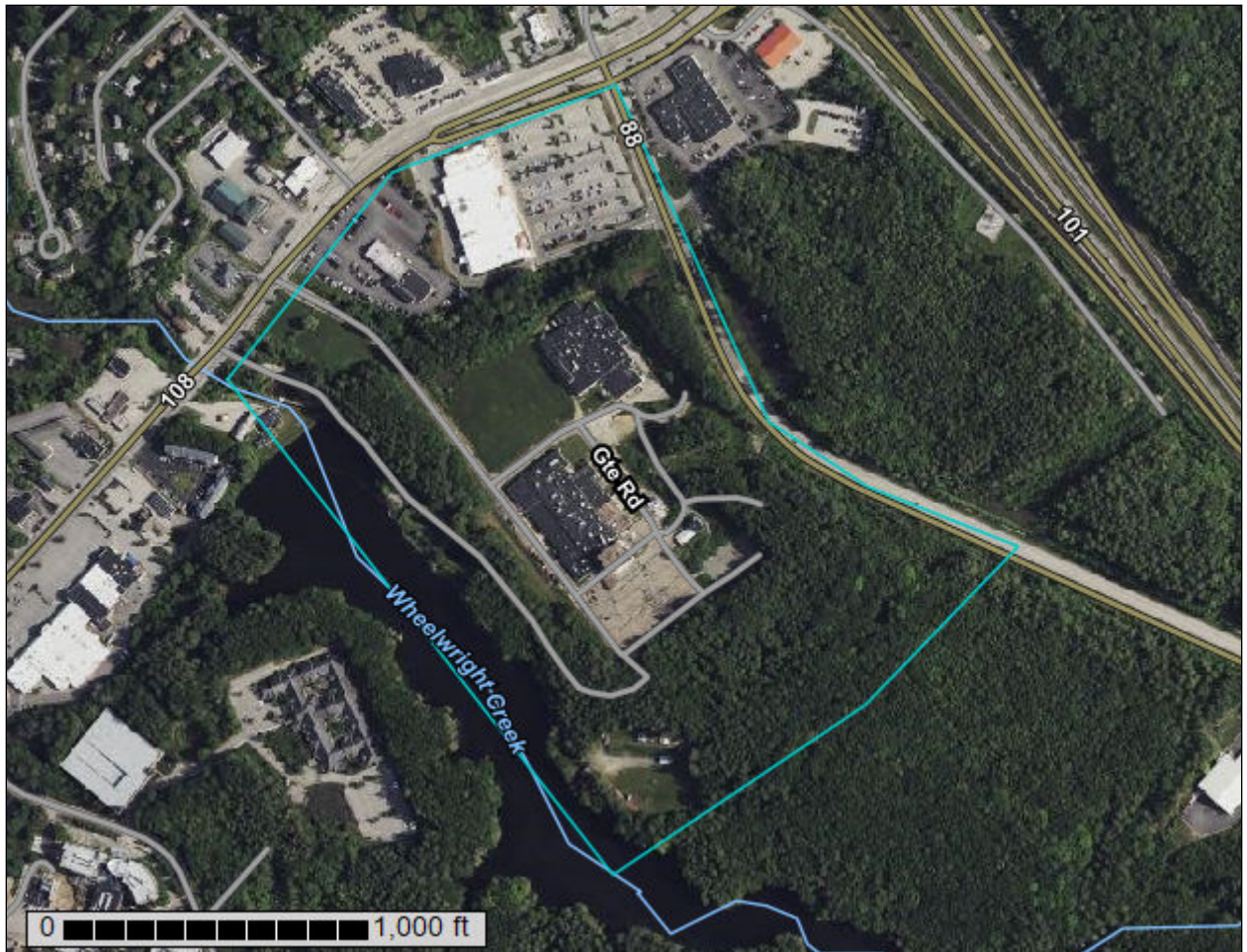
United States  
Department of  
Agriculture

**NRCS**

Natural  
Resources  
Conservation  
Service

A product of the National  
Cooperative Soil Survey,  
a joint effort of the United  
States Department of  
Agriculture and other  
Federal agencies, State  
agencies including the  
Agricultural Experiment  
Stations, and local  
participants

# Custom Soil Resource Report for Rockingham County, New Hampshire



# Preface

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Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# Soil Map

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The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report Soil Map



Soil Map may not be valid at this scale.

Map Scale: 1:6,700 if printed on A landscape (11" x 8.5") sheet.

0 50 100 200 300 Meters


0 300 600 1200 1800 Feet

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





### MAP LEGEND

**Area of Interest (AOI)**

 Area of Interest (AOI)

**Soils**







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

**Special Point Features**






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


**Water Features**

 Streams and Canals

**Transportation**

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

**Background**

 Aerial Photography

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

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

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

Soil Survey Area: Rockingham County, New Hampshire  
 Survey Area Data: Version 25, Sep 12, 2022

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

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



## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
26B	Windsor loamy sand, 3 to 8 percent slopes	11.2	15.0%
33A	Scitico silt loam, 0 to 5 percent slopes	0.7	0.9%
38B	Eldridge fine sandy loam, 3 to 8 percent slopes	24.8	33.1%
299	Udorthents, smoothed	17.1	22.8%
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	1.1	1.5%
699	Urban land	11.5	15.4%
W	Water	8.5	11.4%
<b>Totals for Area of Interest</b>		<b>75.0</b>	<b>100.0%</b>

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it

## Custom Soil Resource Report

was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## Rockingham County, New Hampshire

### 26B—Windsor loamy sand, 3 to 8 percent slopes

#### Map Unit Setting

*National map unit symbol:* 2svkf  
*Elevation:* 0 to 1,210 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Farmland of local importance

#### Map Unit Composition

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

#### Description of Windsor, Loamy Sand

##### Setting

*Landform:* Outwash terraces, outwash plains, dunes, deltas  
*Landform position (three-dimensional):* Tread, riser  
*Down-slope shape:* Linear, convex  
*Across-slope shape:* Linear, convex  
*Parent material:* Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

##### Typical profile

*O - 0 to 1 inches:* moderately decomposed plant material  
*A - 1 to 3 inches:* loamy sand  
*Bw - 3 to 25 inches:* loamy sand  
*C - 25 to 65 inches:* sand

##### Properties and qualities

*Slope:* 3 to 8 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Excessively drained  
*Runoff class:* Low  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to very high (1.42 to 99.90 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 4.5 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 2s  
*Hydrologic Soil Group:* A  
*Ecological site:* F144AY022MA - Dry Outwash  
*Hydric soil rating:* No

### Minor Components

#### Hinckley, loamy sand

*Percent of map unit:* 10 percent

*Landform:* Kames, outwash plains, eskers, deltas

*Landform position (two-dimensional):* Summit, shoulder, backslope

*Landform position (three-dimensional):* Head slope, nose slope, crest, side slope, rise

*Down-slope shape:* Convex

*Across-slope shape:* Convex, linear

*Hydric soil rating:* No

#### Deerfield, loamy sand

*Percent of map unit:* 5 percent

*Landform:* Terraces, outwash plains, deltas

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread, tal

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Hydric soil rating:* No

## 33A—Scitico silt loam, 0 to 5 percent slopes

### Map Unit Setting

*National map unit symbol:* 9cn6

*Elevation:* 0 to 180 feet

*Mean annual precipitation:* 47 to 49 inches

*Mean annual air temperature:* 48 degrees F

*Frost-free period:* 155 to 165 days

*Farmland classification:* Farmland of local importance

### Map Unit Composition

*Scitico and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Scitico

#### Setting

*Landform:* Marine terraces

#### Typical profile

*H1 - 0 to 6 inches:* silt loam

*H2 - 6 to 12 inches:* silty clay loam

*H3 - 12 to 60 inches:* silty clay

#### Properties and qualities

*Slope:* 0 to 5 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Poorly drained

## Custom Soil Resource Report

*Runoff class:* High

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately high (0.00 to 0.20 in/hr)

*Depth to water table:* About 0 to 12 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Moderate (about 7.9 inches)

### **Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 4w

*Hydrologic Soil Group:* C/D

*Ecological site:* F144AY019NH - Wet Lake Plain

*Hydric soil rating:* Yes

### **Minor Components**

#### **Squamscott**

*Percent of map unit:* 5 percent

*Landform:* Marine terraces

*Hydric soil rating:* Yes

#### **Boxford**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

#### **Maybid**

*Percent of map unit:* 5 percent

*Landform:* Marine terraces

*Hydric soil rating:* Yes

## **38B—Eldridge fine sandy loam, 3 to 8 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 9cnb

*Elevation:* 90 to 1,000 feet

*Mean annual precipitation:* 30 to 55 inches

*Mean annual air temperature:* 45 to 54 degrees F

*Frost-free period:* 120 to 180 days

*Farmland classification:* All areas are prime farmland

### **Map Unit Composition**

*Eldridge and similar soils:* 80 percent

*Minor components:* 20 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Eldridge**

#### **Setting**

*Parent material:* Outwash over glaciolacustrine

## Custom Soil Resource Report

### Typical profile

*H1 - 0 to 8 inches:* fine sandy loam  
*H2 - 8 to 23 inches:* loamy fine sand  
*H3 - 23 to 62 inches:* loamy very fine sand

### Properties and qualities

*Slope:* 3 to 8 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Moderately well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.60 in/hr)  
*Depth to water table:* About 12 to 24 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* High (about 9.9 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 2w  
*Hydrologic Soil Group:* C/D  
*Ecological site:* F144AY027MA - Moist Sandy Outwash  
*Hydric soil rating:* No

### Minor Components

#### Well drained inclusion

*Percent of map unit:* 5 percent  
*Hydric soil rating:* No

#### Boxford

*Percent of map unit:* 5 percent  
*Hydric soil rating:* No

#### Scitico

*Percent of map unit:* 5 percent  
*Landform:* Marine terraces  
*Hydric soil rating:* Yes

#### Squamscott

*Percent of map unit:* 5 percent  
*Landform:* Marine terraces  
*Hydric soil rating:* Yes

## 299—Udorthents, smoothed

### Map Unit Setting

*National map unit symbol:* 9cmt  
*Elevation:* 0 to 840 feet  
*Mean annual precipitation:* 44 to 49 inches  
*Mean annual air temperature:* 48 degrees F

## Custom Soil Resource Report

*Frost-free period:* 155 to 165 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Udorthents and similar soils:* 100 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Udorthents

#### Properties and qualities

*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Excessively drained  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None

## 538A—Squamscott fine sandy loam, 0 to 5 percent slopes

### Map Unit Setting

*National map unit symbol:* 9cp9  
*Elevation:* 0 to 1,000 feet  
*Mean annual precipitation:* 30 to 55 inches  
*Mean annual air temperature:* 45 to 54 degrees F  
*Frost-free period:* 120 to 180 days  
*Farmland classification:* Farmland of local importance

### Map Unit Composition

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

### Description of Squamscott

#### Setting

*Landform:* Marine terraces

#### Typical profile

*H1 - 0 to 4 inches:* fine sandy loam  
*H2 - 4 to 12 inches:* loamy sand  
*H3 - 12 to 19 inches:* fine sand  
*H4 - 19 to 65 inches:* silt loam

#### Properties and qualities

*Slope:* 0 to 5 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Poorly drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.60 in/hr)  
*Depth to water table:* About 0 to 12 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None

## Custom Soil Resource Report

*Available water supply, 0 to 60 inches: High (about 9.6 inches)*

### **Interpretive groups**

*Land capability classification (irrigated): None specified*

*Land capability classification (nonirrigated): 4w*

*Hydrologic Soil Group: C/D*

*Ecological site: F144AY019NH - Wet Lake Plain*

*Hydric soil rating: Yes*

### **Minor Components**

#### **Scitico**

*Percent of map unit: 5 percent*

*Landform: Marine terraces*

*Hydric soil rating: Yes*

#### **Maybid**

*Percent of map unit: 5 percent*

*Landform: Marine terraces*

*Hydric soil rating: Yes*

#### **Eldridge**

*Percent of map unit: 5 percent*

*Hydric soil rating: No*

## **699—Urban land**

### **Map Unit Composition**

*Urban land: 85 percent*

*Minor components: 15 percent*

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Minor Components**

#### **Not named**

*Percent of map unit: 15 percent*

*Hydric soil rating: No*

## **W—Water**

### **Map Unit Setting**

*National map unit symbol: 9cq3*

*Elevation: 200 to 2,610 feet*

*Farmland classification: Not prime farmland*

### **Map Unit Composition**

*Water: 100 percent*

*Estimates are based on observations, descriptions, and transects of the mapunit.*



## Custom Soil Resource Report

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# Test Pit Report

For

**Wakefield Thermal**  
**131 Portsmouth Ave,**  
Exeter, NH

Prepared For

**Wakefield Thermal**  
45659.51

PREPARED BY

**TFMoran, Inc.**

**48 Constitution Drive**  
**Bedford, NH 03110**

February 5<sup>th</sup>, 2023

## Test Pit # 1 January 25<sup>th</sup>, 2023

0 – 8” 10YR 4/4 Dark Yellowish Brown, Sandy Loam, Friable, Common Roots, Massive

8 – 29” 10YR 7/2 Light Gray, Fine Sand, Single Grained, Loose, Homogenous

29 – 41” 10YR 5/6 Yellowish Brown, Loamy Sand, Medium-Platy, Firm, Conglomeration of Sediments, Ornstein Forming, Redoximorphic Features Present (5YR 5/8 Yellowish Red)

41 – 60” Gley 1 7/N Light Gray, Sandy Clay Loam, Massive, Indurate, Homogenous, Inclusions of FS (10YR 5/8 Yellowish Brown), Odor of Sulfur, Aquatard (Perching Water Table)

60 – 102” Gley 2 5/10B Bluish Gray, Clay, Blocky, Fragmented, Homogenous, Many Redoximorphic Features (10YR 2/1 Black (Ferric))

REDOX OBS: Common @ 41” Below Grade 5YR 5/8 Yellowish Red

### Soil Series: Windsor

OBSWT: 41” Below Grade

ESHWT: 38” Below Grade

Roots: Common 8” Below Grade

Ledge: 102” +

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## Test Pit # 2 January 25<sup>th</sup>, 2023

0 – 13” 10YR 4/3 Brown, Sandy Loam, Massive, Friable, Common Roots

13 – 25” 10YR 5/4 Yellowish Brown, Loamy Sand, Massive, Friable, Homogenous, Few Roots

25 – 56” 10YR 7/2 Light Gray, Medium Sand, Single Grained, Very Firm, Heterogenous, Inclusions of 10YR 5/6 Yellowish Brown, Redoximorphic Features Present (5YR 5/8 Yellowish Red)

56 – 63” Gley 1 7/N Light Gray, Sandy Clay Loam, Massive, Indurate, Homogenous, Inclusions of CS (10YR 4/4 Dark Yellowish Brown), Odor of Sulfur, Aquatard (Perching Water Table)

63 – 66” 10YR 4/4 Dark Yellowish Brown, Coarse Sand, Single Grained, Loose, Stratified, Redoximorphic Features Common (2.5Y 7/6 Yellow)

66 – 102” Gley 2 5/10B Bluish Gray, Clay, Blocky, Fragmented, Homogenous, Many Redoximorphic Features (10YR 2/1 Black (Ferric))

REDOX OBS: Common @ 56” Below Grade 5YR 5/8 Yellowish Red

### Soil Series: Windsor

OBSWT: 56” Below Grade

ESHWT: 50” Below Grade

Roots: Few 25” Below Grade

Ledge: 102” +

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## Test Pit # 3 January 25<sup>th</sup>, 2023

0 – 7” 10YR 3/3 Dark Brown, Sandy Loam, Massive, Friable, Few Angular Stones, Few Roots

7 – 13” 10YR 6/4 Light Yellowish Brown, Loamy Sand, Single Grained, Homogenous, Very Friable, Few Angular Stones, Few Angular Graves

13 – 36” 10YR 5/6 Yellowish Brown, Fine Sand, Single Grained, Loose, Super Saturated 25” (Heavy Rain in Past Weeks), Redoximorphic Features (7.5YR 5/8 Strong Brown)

36 – 59” 10R 4/6 Dark Yellowish Brown, Medium Sand, Very Firm, Single Grained, Super Saturated, Conglomeration of Sediments, Redoximorphic Features (7.5YR 5/8 Strong Brown), Redoximorphic Features (2.5Y 7/6 Yellow)

59 – 68” Gley 1 7/N Light Gray, Sandy Clay Loam, Massive, Indurate, Homogenous, Inclusions of CS (10YR 4/4 Dark Yellowish Brown), Odor of Sulfur, Aquatard (Perching Water Table)

68 – 96” Gley 2 5/10B Bluish Gray, Clay, Blocky, Fragmented, Homogenous, Many Redoximorphic Features (10YR 2/1 Black (Ferric))

REDOX OBS: Common @ 30” Below Grade 7.5YR 5/8 Strong Brown

### Soil Series: Windsor

OBSWT: 42” Below Grade

ESHW: 30” Below Grade

Roots: common 18” Below Grade

Ledge: 96” +

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## Test Pit # 4 January 25<sup>th</sup>, 2023

0 – 13” 10YR 4/3 Brown, Sandy Loam, Friable, Massive, Few Angular Stones, Saturated, Roots Common

13 – 25” 10YR 5/4 Yellowish Brown, Loam, Massive, Firm, Many Angular Stones, Few Boulders, Few Angular Cobbles, Saturated

25 – 49” 2.5Y 5/4 Light Olive Brown, Sandy Loam, Massive, Very Firm, Many Angular Stones, Redoximorphic Features (5YR 5/8 Yellowish Red), Inclusions of Sandy Clay Loam (Gley 1 7/N Light Gray)

49 – 57” Gley 1 7/N Light Gray, Sandy Clay Loam, Massive, Indurate, Common Redoximorphic Features (2.5Y 7/6 Yellow)

57 – 61” Gley 1 8/N White, Fine Sand, Single Grained, Loose, Homogenous

61 – 66” Gley 1 7/N Light Gray, Sandy Clay Loam, Massive, Indurate, Common Redoximorphic Features (2.5Y 7/6 Yellow)

66 – 69” Gley 1 8/N White, Fine Sand, Single Grained, Loose, Homogenous

69 – 110” Gley 2 5/10B Bluish Gray, Clay, Blocky, Firm, Fragmented, Homogenous, Many Redoximorphic Features (10YR 2/1 Black (Ferric))

REDOX OBS: Common @ 62” Below Grade 10R 5/8 Red

### **Soil Series: Eldridge**

OBSWT: 49” Below Grade

ESHWT: 40” Below Grade

Roots: common 13” Below Grade

Ledge: 110” +

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## Test Pit # 5 January 25<sup>th</sup>, 2023

0 – 18” 10YR 4/3 Brown, Sandy Loam, Firm, Massive, Few Angular Stones, Saturated

18 – 29” 10YR 5/4 Yellowish Brown, Loamy Sand, Massive, Firm, Many Angular Stones, Few Angular Cobbles, Homogenous

29 – 53” 10YR 5/3 Brown, Loam, Massive, Very Firm, Many Angular Stones, Very Few Redoximorphic Features (5YR 5/8 Yellowish Red)

53 – 61” Gley 2 4/5B Dark Bluish Gray, Sandy Clay, Massive, Indurate, Odor of Sulfur, Aquatard, Few Cobbles, Conglomeration at Start (53” (Ornstein Forming)), Common Redoximorphic Features 5YR 5/8 Yellowish Red & 2.5Y 7/6 Yellow

61 – 75” 10YR 7/3 Very Pale Brown, Fine Sand, Single Grained, Friable, Homogenous, Saturated, Common Redoximorphic Features 2.5Y 7/6 Yellow

75 – 82” Gley 1 7/N Light Gray, Fine Sand, Single Grained, Friable, Common Redoximorphic Features (2.5Y 7/6 Yellow), Super Saturated

82 – 146” Gley 1 7/N Light Gray, Sandy Clay Loam, Blocky, Fragmented, Firm, Homogenous, Many Redoximorphic Features (10YR 2/1 Black (Ferric))

REDOX OBS: Common @ 53” Below Grade 5YR 5/8 Yellowish Red

### Soil Series: Eldridge

OBSWT: 77” Below Grade

ESHWT: 53” Below Grade / Over – Excavated: 67” Below Grade

Roots: N/A

Ledge: 146” +

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## Test Pit # 6 January 25<sup>th</sup>, 2023

- 0 – 14" 10YR 4/3 Brown, Sandy Loam, Massive, Few Angular Stones, Very Friable
- 14 – 50" 10YR 5/4 Yellowish Brown, Loamy Sand, Massive, Firm, Many Angular Stones
- 50 – 62" Gley 2 4/5B Bluish Gray, Sandy Clay, Massive, Indurate, Odor of Sulfur, Homogenous, Many Redoximorphic Features (7.5YR 5/8 Strong Brown)
- 62 – 80" 2.5Y 5/4 Light Olive Brown, Fine Sand, Single Grained, Loose, Redoximorphic Features (5YR 5/6 Yellowish Red)
- 80 – 86" 10YR 7/2 Light Gray, Fine Sand, Single Grained, Friable, Few Redoximorphic Features (2.5Y 7/6 Yellow)
- 86 – 108" Gley 1 7/N Light Gray, Sandy Clay Loam, Blocky, Indurate, Common Many Redoximorphic Features (10YR 2/1 Black (Ferric))

REDOX OBS: Many @ 50" Below Grade 7.5YR 5/8 Strong Brown

### Soil Series: Eldridge

OBSWT: 80" Below Grade

ESHWT: 50" Below Grade / Over – Excavated: 70" Below Grade

Roots: N/A

Ledge: 108" +



## Test Pit # 7 January 25<sup>th</sup>, 2023

0 – 2” 10YR 3/4 Dark Yellowish Brown, Loam, Friable, Massive, Many Roots, Fill

2 – 44” 2.5Y 6/4 Yellowish Brown, Fine Sand, Single Grained, Loose, Homogenous, Conglomerations 40” Below Grade, Super Saturated 40” Below Grade, Fill, Redoximorphic Features (5YR 5/8 Yellowish Red)

44 – 98” Gley 1 5/N Gray, Clay, Blocky, Indurate, Homogenous, Many Redoximorphic Features (10YR 2/1 Black (Ferric)), Aquatard, Perching Water Table

REDOX OBS: Common @ 42” Below Grade 10R 5/8 Red

### Soil Series: Udorthents

OBSWT: N/A

ESHWT: 42” Below Grade

Roots: common 2” Below Grade

Ledge: 97” +

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## Test Pit # 8 January 25<sup>th</sup>, 2023

0 – 2" 10YR 3/4 Dark Yellowish Brown, Loam, Friable, Massive, Roots Common, Fill

2 – 58" 2.5Y 6/4 Yellowish Brown, Fine Sand, Single Grained, Loose, Homogenous, Conglomerations 58" Below Grade, Redoximorphic Features (5YR 5/8 Yellowish Red), Fill

58 – 97" Gley 1 5/N Gray, Clay, Blocky, Indurate, Homogenous, Many Redoximorphic Features (10YR 2/1 Black (Ferric)), Aquatard, Perching Water Table

REDOX OBS: Common @ 52" Below Grade 10R 5/8 Red

### Soil Series: Udorthents

OBSWT: N/A

ESHW: 52" Below Grade

Roots: common 2" Below Grade

Ledge: 97" +

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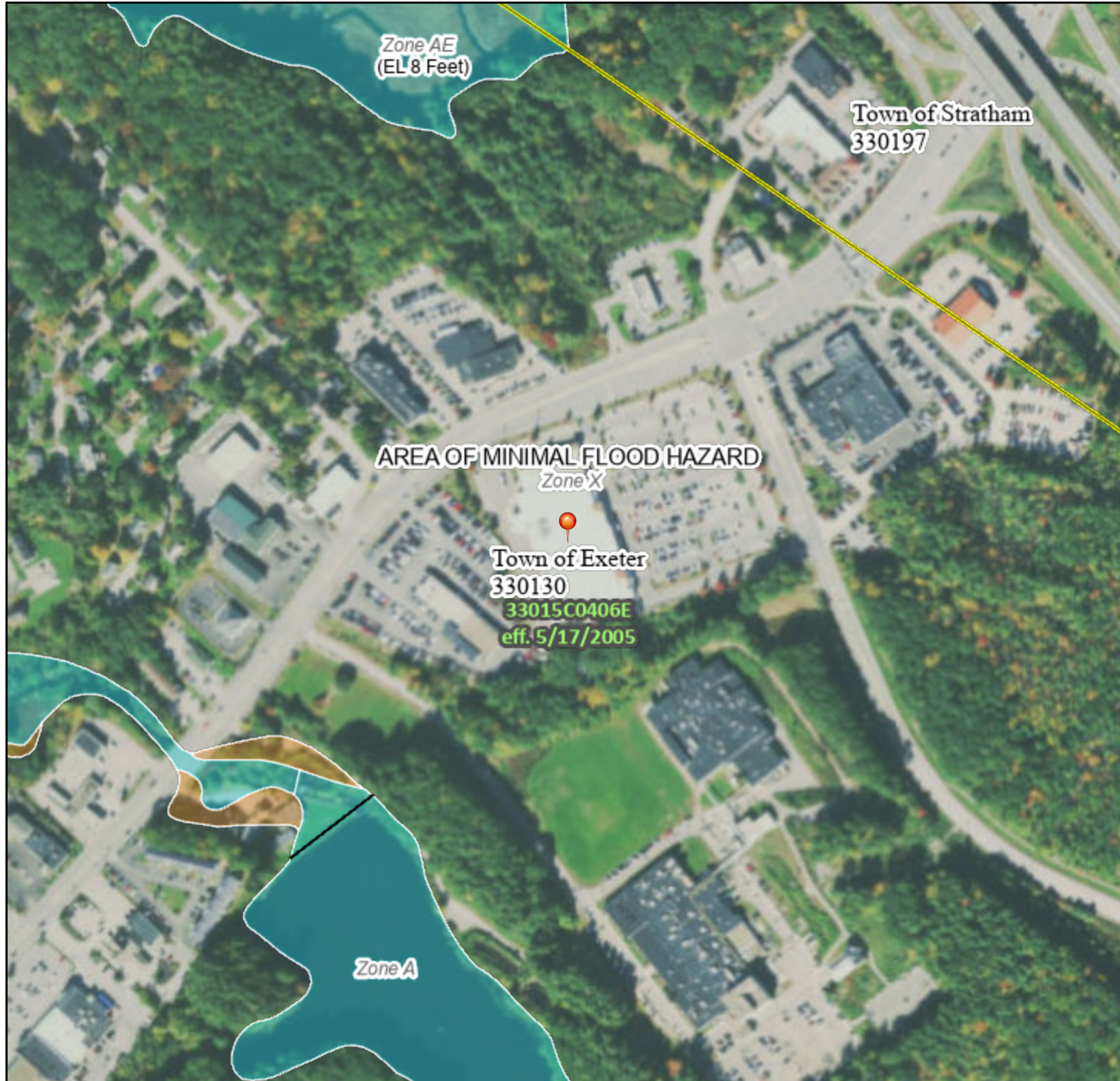




# National Flood Hazard Layer FIRMMette



70°56'9"W 42°59'34"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000

70°55'32"W 42°59'8"N

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) <i>Zone A, V, A99</i>
		With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i>
		Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>
		Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>
		Area with Flood Risk due to Levee <i>Zone D</i>
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard <i>Zone D</i>
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance
		17.5 Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
MAP PANELS		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **1/27/2023 at 3:53 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



Civil Engineers  
Structural Engineers  
Traffic Engineers  
Land Surveyors  
Landscape Architects  
Scientists

**131 Portsmouth Ave, Exeter NH**

Photo 1



Image captures the location of the proposed parking expansion in the northeast corner of the parcel.

Photo 2



Image captures the north-east corner of the subject parcel, which will provide parking and access.



Civil Engineers  
Structural Engineers  
Traffic Engineers  
Land Surveyors  
Landscape Architects  
Scientists

Photo 3



Image captures the existing building on the subject parcel, facing north and proposed addition location on the subject parcel, facing west.

Photo 4



Image captures existing mad made wetland off site which captures and treats site runoff.



# Extreme Precipitation Tables

## Northeast Regional Climate Center

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

<b>Smoothing</b>	Yes
<b>State</b>	New Hampshire
<b>Location</b>	
<b>Longitude</b>	70.929 degrees West
<b>Latitude</b>	42.988 degrees North
<b>Elevation</b>	0 feet
<b>Date/Time</b>	Fri, 27 Jan 2023 15:44:32 -0500

### Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
<b>1yr</b>	0.26	0.40	0.50	0.66	0.82	1.04	<b>1yr</b>	0.71	0.99	1.22	1.57	2.05	2.68	2.91	<b>1yr</b>	2.38	2.80	3.21	3.92	4.55	<b>1yr</b>
<b>2yr</b>	0.32	0.50	0.62	0.81	1.02	1.30	<b>2yr</b>	0.88	1.18	1.52	1.94	2.50	3.22	3.57	<b>2yr</b>	2.85	3.44	3.95	4.69	5.34	<b>2yr</b>
<b>5yr</b>	0.37	0.58	0.73	0.98	1.25	1.62	<b>5yr</b>	1.08	1.47	1.90	2.45	3.16	4.10	4.60	<b>5yr</b>	3.63	4.42	5.06	5.98	6.75	<b>5yr</b>
<b>10yr</b>	0.41	0.65	0.82	1.12	1.46	1.90	<b>10yr</b>	1.26	1.73	2.25	2.92	3.78	4.91	5.56	<b>10yr</b>	4.35	5.35	6.10	7.19	8.07	<b>10yr</b>
<b>25yr</b>	0.48	0.77	0.98	1.35	1.79	2.36	<b>25yr</b>	1.55	2.15	2.80	3.67	4.79	6.25	7.16	<b>25yr</b>	5.53	6.88	7.82	9.18	10.22	<b>25yr</b>
<b>50yr</b>	0.54	0.87	1.11	1.56	2.10	2.79	<b>50yr</b>	1.81	2.54	3.33	4.38	5.74	7.50	8.67	<b>50yr</b>	6.64	8.34	9.44	11.06	12.23	<b>50yr</b>
<b>100yr</b>	0.60	0.98	1.26	1.80	2.45	3.30	<b>100yr</b>	2.12	3.00	3.96	5.24	6.88	9.00	10.51	<b>100yr</b>	7.97	10.10	11.40	13.32	14.63	<b>100yr</b>
<b>200yr</b>	0.69	1.12	1.45	2.08	2.87	3.90	<b>200yr</b>	2.48	3.55	4.70	6.24	8.23	10.82	12.73	<b>200yr</b>	9.57	12.24	13.77	16.05	17.52	<b>200yr</b>
<b>500yr</b>	0.82	1.34	1.75	2.54	3.55	4.86	<b>500yr</b>	3.06	4.43	5.88	7.86	10.44	13.78	16.41	<b>500yr</b>	12.20	15.78	17.68	20.55	22.25	<b>500yr</b>

### Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
<b>1yr</b>	0.24	0.37	0.45	0.60	0.74	0.89	<b>1yr</b>	0.64	0.87	0.94	1.26	1.56	2.28	2.54	<b>1yr</b>	2.02	2.44	2.89	3.39	4.00	<b>1yr</b>
<b>2yr</b>	0.32	0.49	0.60	0.81	1.00	1.19	<b>2yr</b>	0.87	1.16	1.37	1.82	2.33	3.11	3.51	<b>2yr</b>	2.75	3.37	3.86	4.58	5.14	<b>2yr</b>
<b>5yr</b>	0.36	0.55	0.68	0.93	1.19	1.42	<b>5yr</b>	1.03	1.39	1.62	2.12	2.74	3.84	4.29	<b>5yr</b>	3.40	4.13	4.74	5.63	6.35	<b>5yr</b>
<b>10yr</b>	0.39	0.61	0.75	1.05	1.35	1.62	<b>10yr</b>	1.17	1.59	1.82	2.40	3.07	4.43	5.00	<b>10yr</b>	3.92	4.81	5.52	6.53	7.32	<b>10yr</b>
<b>25yr</b>	0.45	0.69	0.86	1.23	1.61	1.94	<b>25yr</b>	1.39	1.90	2.12	2.78	3.58	4.90	6.10	<b>25yr</b>	4.34	5.87	6.74	7.92	8.87	<b>25yr</b>
<b>50yr</b>	0.50	0.76	0.95	1.37	1.84	2.23	<b>50yr</b>	1.59	2.18	2.36	3.12	4.01	5.55	7.09	<b>50yr</b>	4.91	6.81	7.83	9.19	10.24	<b>50yr</b>
<b>100yr</b>	0.56	0.85	1.07	1.54	2.12	2.56	<b>100yr</b>	1.83	2.51	2.65	3.48	4.47	6.25	8.21	<b>100yr</b>	5.53	7.90	9.10	10.62	11.78	<b>100yr</b>
<b>200yr</b>	0.63	0.95	1.20	1.74	2.43	2.94	<b>200yr</b>	2.10	2.87	2.95	3.87	4.98	7.02	9.63	<b>200yr</b>	6.21	9.26	10.58	12.27	13.58	<b>200yr</b>
<b>500yr</b>	0.74	1.10	1.42	2.06	2.93	3.55	<b>500yr</b>	2.53	3.47	3.42	4.46	5.78	8.15	11.73	<b>500yr</b>	7.21	11.28	12.90	14.79	16.36	<b>500yr</b>

### Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
<b>1yr</b>	0.28	0.44	0.54	0.72	0.89	1.08	<b>1yr</b>	0.76	1.06	1.26	1.72	2.18	2.98	3.10	<b>1yr</b>	2.63	2.98	3.58	4.31	5.01	<b>1yr</b>
<b>2yr</b>	0.33	0.51	0.63	0.86	1.06	1.26	<b>2yr</b>	0.91	1.23	1.48	1.95	2.49	3.41	3.66	<b>2yr</b>	3.01	3.52	4.05	4.84	5.64	<b>2yr</b>
<b>5yr</b>	0.40	0.62	0.77	1.05	1.34	1.62	<b>5yr</b>	1.16	1.58	1.87	2.49	3.18	4.37	4.91	<b>5yr</b>	3.87	4.72	5.40	6.35	7.17	<b>5yr</b>
<b>10yr</b>	0.47	0.73	0.90	1.26	1.63	1.97	<b>10yr</b>	1.40	1.93	2.26	3.03	3.83	5.43	6.14	<b>10yr</b>	4.81	5.90	6.75	7.89	8.81	<b>10yr</b>
<b>25yr</b>	0.58	0.89	1.11	1.58	2.08	2.56	<b>25yr</b>	1.79	2.50	2.93	3.94	4.91	7.68	8.28	<b>25yr</b>	6.79	7.96	9.04	10.52	11.55	<b>25yr</b>
<b>50yr</b>	0.68	1.04	1.30	1.86	2.51	3.11	<b>50yr</b>	2.16	3.04	3.56	4.81	5.96	9.62	10.39	<b>50yr</b>	8.52	9.99	11.32	13.10	14.21	<b>50yr</b>
<b>100yr</b>	0.81	1.22	1.52	2.20	3.02	3.78	<b>100yr</b>	2.61	3.70	4.33	5.88	7.24	12.07	13.04	<b>100yr</b>	10.68	12.54	14.15	16.36	17.50	<b>100yr</b>
<b>200yr</b>	0.94	1.42	1.80	2.61	3.64	4.61	<b>200yr</b>	3.14	4.51	5.29	7.19	8.78	15.18	16.24	<b>200yr</b>	13.43	15.62	17.73	20.42	21.56	<b>200yr</b>
<b>500yr</b>	1.17	1.75	2.25	3.26	4.64	5.97	<b>500yr</b>	4.00	5.83	6.86	9.42	11.35	20.58	21.94	<b>500yr</b>	18.21	21.09	23.84	27.40	28.47	<b>500yr</b>







## FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

**Type/Node Name:** Stormtech 1 (ST1)(lined with impermeable liner)

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
5.17	ac	A = Area draining to the practice	
3.51	ac	A <sub>i</sub> = Impervious area draining to the practice	
0.68	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.66	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
3.42	ac-in	WQV = 1" x Rv x A	
12,420	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
3,105	cf	25% x WQV (check calc for sediment forebay volume)	
9,315	cf	75% x WQV (check calc for surface sand filter volume)	
Isolater row/DSCB		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V <sub>SED</sub> = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
<b>Calculate time to drain if system IS NOT underdrained:</b>			
	sf	A <sub>SA</sub> = Surface area of the practice	
	iph	Ksat <sub>DESIGN</sub> = Design infiltration rate <sup>1</sup>	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
YES	Yes/No	(Use the calculations below)	
-	hours	T <sub>DRAIN</sub> = Drain time = V / (A <sub>SA</sub> * I <sub>DESIGN</sub> )	≤ 72-hrs
<b>Calculate time to drain if system IS underdrained:</b>			
25.49	ft	E <sub>WQV</sub> = Elevation of WQV (attach stage-storage table)	
0.11	cfs	Q <sub>WQV</sub> = Discharge at the E <sub>WQV</sub> (attach stage-discharge table)	
62.73	hours	T <sub>DRAIN</sub> = Drain time = 2WQV/Q <sub>WQV</sub>	≤ 72-hrs
22.80	feet	E <sub>FC</sub> = Elevation of the bottom of the filter course material <sup>2</sup>	
21.80	feet	E <sub>UD</sub> = Invert elevation of the underdrain (UD), if applicable	
31.80	feet	E <sub>SHWT</sub> = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
27.50	feet	E <sub>ROCK</sub> = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	D <sub>FC to UD</sub> = Depth to UD from the bottom of the filter course	≥ 1'
(4.70)	feet	D <sub>FC to ROCK</sub> = Depth to bedrock from the bottom of the filter course	≥ 1'
(9.00)	feet	D <sub>FC to SHWT</sub> = Depth to SHWT from the bottom of the filter course	≥ 1'
31	1/50 ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
31.55	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
<b>If a surface sand filter or underground sand filter is proposed:</b>			
YES	ac	Drainage Area check.	< 10 ac
62,354	cf	V = Volume of storage <sup>3</sup> (attach a stage-storage table)	≥ 75%WQV
24.0	inches	D <sub>FC</sub> = Filter course thickness	18", or 24" if within GPA
Sheet	C-18	Note what sheet in the plan set contains the filter course specification.	
YES	Yes/No	Access grate provided?	← yes



**45659-51 Post SSS**

Prepared by TF Moran, INC

HydroCAD® 10.10-7a s/n 00866 © 2021 HydroCAD Software Solutions LLC

Printed 3/30/2023

Page 1

**Rainfall Events Listing (selected events)**

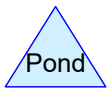
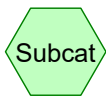
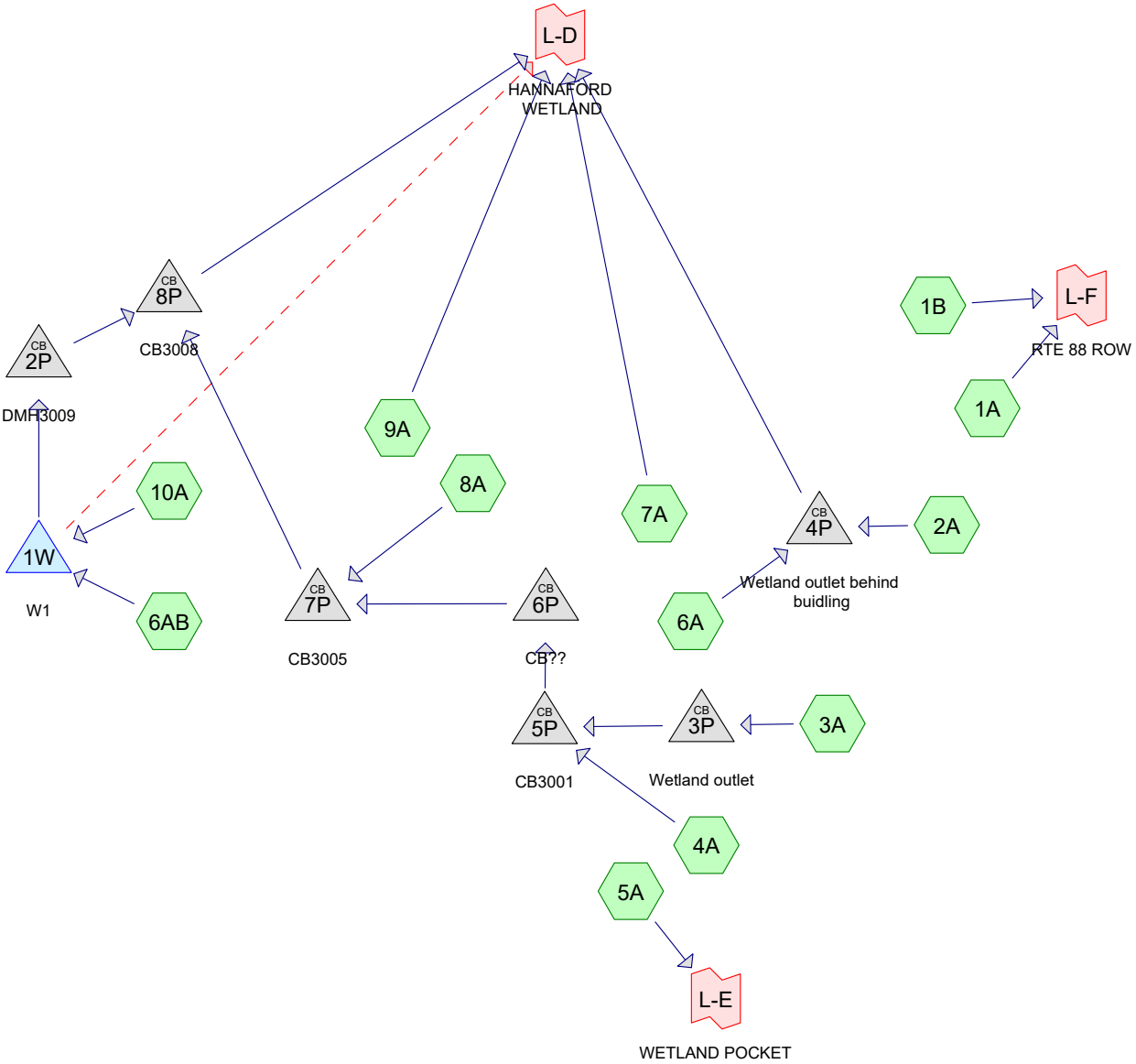
Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	50yr24hr	Type III 24-hr		Default	24.00	1	8.63	2

**Stage-Discharge for Pond ST1:**

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
21.50	0.00	0.00	0.00	26.80	0.13	0.13	0.00
21.60	0.00	0.00	0.00	26.90	0.13	0.13	0.00
21.70	0.00	0.00	0.00	27.00	0.13	0.13	0.00
21.80	0.00	0.00	0.00	27.10	0.14	0.14	0.00
21.90	0.01	0.01	0.00	27.20	0.14	0.14	0.00
22.00	0.02	0.02	0.00	27.30	0.14	0.14	0.00
22.10	0.03	0.03	0.00	27.40	0.14	0.14	0.00
22.20	0.03	0.03	0.00	27.50	0.14	0.14	0.00
22.30	0.04	0.04	0.00	27.60	0.14	0.14	0.00
22.40	0.04	0.04	0.00	27.70	0.14	0.14	0.00
22.50	0.05	0.05	0.00	27.80	0.14	0.14	0.00
22.60	0.05	0.05	0.00	27.90	0.15	0.15	0.00
22.70	0.05	0.05	0.00	28.00	0.15	0.15	0.00
22.80	0.06	0.06	0.00	28.10	0.15	0.15	0.00
22.90	0.06	0.06	0.00	28.20	0.15	0.15	0.00
23.00	0.06	0.06	0.00	28.30	0.15	0.15	0.00
23.10	0.07	0.07	0.00	28.40	0.21	0.15	0.05
23.20	0.07	0.07	0.00	28.50	0.37	0.15	0.21
23.30	0.07	0.07	0.00	28.60	0.62	0.15	0.47
23.40	0.07	0.07	0.00	28.70	0.97	0.15	0.81
23.50	0.08	0.08	0.00	28.80	1.40	0.16	1.24
23.60	0.08	0.08	0.00	28.90	1.90	0.16	1.74
23.70	0.08	0.08	0.00	29.00	2.45	0.16	2.29
23.80	0.08	0.08	0.00	29.10	3.01	0.16	2.85
23.90	0.08	0.08	0.00	29.20	3.60	0.16	3.44
24.00	0.09	0.09	0.00	29.30	4.22	0.16	4.06
24.10	0.09	0.09	0.00	29.40	4.87	0.16	4.70
24.20	0.09	0.09	0.00	29.50	5.52	0.16	5.36
24.30	0.09	0.09	0.00	29.60	6.19	0.16	6.02
24.40	0.09	0.09	0.00	29.70	6.85	0.17	6.68
24.50	0.10	0.10	0.00	29.80	7.50	0.17	7.33
24.60	0.10	0.10	0.00	29.90	8.01	0.17	7.84
24.70	0.10	0.10	0.00	30.00	8.46	0.17	8.29
24.80	0.10	0.10	0.00	30.10	8.89	0.17	8.72
24.90	0.10	0.10	0.00	30.20	9.30	0.17	9.12
25.00	0.10	0.10	0.00	30.30	9.68	0.17	9.51
25.10	0.11	0.11	0.00	30.40	10.06	0.17	9.89
25.20	0.11	0.11	0.00	30.50	10.42	0.17	10.25
25.30	0.11	0.11	0.00	30.60	10.77	0.17	10.59
25.40	0.11	0.11	0.00	30.70	11.11	0.18	10.93
25.50	0.11	0.11	0.00	30.80	11.43	0.18	11.26
25.60	0.11	0.11	0.00	30.90	11.75	0.18	11.57
25.70	0.12	0.12	0.00	31.00	12.06	0.18	11.88
25.80	0.12	0.12	0.00	31.10	12.36	0.18	12.18
25.90	0.12	0.12	0.00	31.20	12.66	0.18	12.48
26.00	0.12	0.12	0.00	31.30	12.94	0.18	12.76
26.10	0.12	0.12	0.00	31.40	13.23	0.18	13.04
26.20	0.12	0.12	0.00	31.50	13.50	0.18	13.32
26.30	0.12	0.12	0.00				
26.40	0.13	0.13	0.00				
26.50	0.13	0.13	0.00				
26.60	0.13	0.13	0.00				
26.70	0.13	0.13	0.00				

**Stage-Area-Storage for Pond ST1:**

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
21.50	0	26.80	27,060
21.60	471	26.90	28,050
21.70	942	27.00	29,036
21.80	1,413	27.10	30,017
21.90	1,884	27.20	30,993
22.00	2,355	27.30	31,963
22.10	2,826	27.40	32,928
22.20	3,297	27.50	33,887
22.30	3,768	27.60	34,839
22.40	4,239	27.70	35,785
22.50	4,710	27.80	36,725
22.60	5,181	27.90	37,657
22.70	5,652	28.00	38,582
22.80	6,124	28.10	39,499
22.90	6,359	28.20	40,408
23.00	6,595	28.30	41,309
23.10	6,830	28.40	42,201
23.20	7,066	28.50	43,083
23.30	7,301	28.60	43,956
23.40	7,537	28.70	44,818
23.50	7,772	28.80	45,670
23.60	8,008	28.90	46,510
23.70	8,243	29.00	47,338
23.80	8,479	29.10	48,153
23.90	8,714	29.20	48,954
24.00	8,950	29.30	49,742
24.10	9,185	29.40	50,513
24.20	9,421	29.50	51,269
24.30	9,656	29.60	52,007
24.40	9,892	29.70	52,724
24.50	10,127	29.80	53,420
24.60	10,363	29.90	54,090
24.70	10,598	30.00	54,729
24.80	10,834	30.10	55,324
24.90	11,306	30.20	55,872
25.00	11,778	30.30	56,393
25.10	12,251	30.40	56,900
25.20	12,723	30.50	57,393
25.30	13,195	30.60	57,868
25.40	13,668	30.70	58,340
25.50	14,140	30.80	58,812
25.60	14,892	30.90	59,284
25.70	15,921	<b>31.00</b>	<b>59,757</b>
25.80	16,949	31.10	60,229
25.90	17,974	31.20	60,701
26.00	18,996	31.30	61,173
26.10	20,016	31.40	61,646
26.20	21,033	31.50	<b>62,118</b>
26.30	22,046		
26.40	23,056		
26.50	24,063		
26.60	25,066		
26.70	26,065		



**Routing Diagram for 45659-51 Pre SSS**  
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**45659-51 Pre SSS**

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**Rainfall Events Listing**

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1yr24hr	Type III 24-hr		Default	24.00	1	3.08	2
2	2yr24hr	Type III 24-hr		Default	24.00	1	3.70	2
3	10yr24hr	Type III 24-hr		Default	24.00	1	5.65	2
4	25yr24hr	Type III 24-hr		Default	24.00	1	7.19	2
5	50yr24hr	Type III 24-hr		Default	24.00	1	8.63	2

**Area Listing (all nodes)**

Area (sq-ft)	CN	Description (subcatchment-numbers)
5,101	68	<50% Grass cover, Poor, HSG A (4A, 5A)
1,046	79	<50% Grass cover, Poor, HSG B (4A)
43,440	39	>75% Grass cover, Good, HSG A (1B, 4A, 5A, 7A, 9A, 10A)
109,829	61	>75% Grass cover, Good, HSG B (3A, 4A, 7A, 8A, 9A, 10A)
3,031	74	>75% Grass cover, Good, HSG C (5A, 9A, 10A)
30,393	80	>75% Grass cover, Good, HSG D (4A, 5A, 8A, 10A)
27,755	48	Brush, Good, HSG B (2A, 3A)
2,845	65	Brush, Good, HSG C (2A, 3A)
12,675	96	Gravel surface, HSG B (2A, 3A, 4A, 7A, 8A)
26,804	98	Paved parking, HSG B (2A, 3A, 4A, 5A)
23,478	98	Paved parking, HSG D (4A, 5A, 8A)
545	98	Roofs, HSG D (8A)
1,507	98	Unconnected pavement, HSG B (7A, 8A)
61,614	98	Unconnected roofs, HSG B (6A, 6AB)
6,100	30	Woods, Good, HSG A (1B, 3A, 4A, 5A)
90,248	55	Woods, Good, HSG B (1A, 2A, 3A, 4A, 5A, 7A)
8,759	70	Woods, Good, HSG C (7A)
<b>455,170</b>	<b>68</b>	<b>TOTAL AREA</b>

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**Soil Listing (all nodes)**

Area (sq-ft)	Soil Group	Subcatchment Numbers
54,641	HSG A	1B, 3A, 4A, 5A, 7A, 9A, 10A
331,478	HSG B	1A, 2A, 3A, 4A, 5A, 6A, 6AB, 7A, 8A, 9A, 10A
14,635	HSG C	2A, 3A, 5A, 7A, 9A, 10A
54,416	HSG D	4A, 5A, 8A, 10A
0	Other	
<b>455,170</b>		<b>TOTAL AREA</b>

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1A:** Runoff Area=9,261 sf 0.00% Impervious Runoff Depth>0.21"  
Flow Length=138' Tc=18.6 min CN=55 Runoff=0.01 cfs 166 cf

**Subcatchment 1B:** Runoff Area=1,862 sf 0.00% Impervious Runoff Depth=0.00"  
Tc=6.0 min CN=33 Runoff=0.00 cfs 0 cf

**Subcatchment 2A:** Runoff Area=52,064 sf 11.62% Impervious Runoff Depth>0.36"  
Flow Length=532' Tc=21.8 min CN=60 Runoff=0.20 cfs 1,560 cf

**Subcatchment 3A:** Runoff Area=42,260 sf 31.25% Impervious Runoff Depth>0.71"  
Flow Length=357' Tc=17.8 min CN=69 Runoff=0.49 cfs 2,498 cf

**Subcatchment 4A:** Runoff Area=43,490 sf 22.05% Impervious Runoff Depth>0.58"  
Flow Length=513' Tc=18.6 min CN=66 Runoff=0.37 cfs 2,102 cf

**Subcatchment 5A:** Runoff Area=36,670 sf 28.94% Impervious Runoff Depth>0.50"  
Flow Length=235' Tc=19.5 min CN=64 Runoff=0.25 cfs 1,531 cf

**Subcatchment 6A:** Runoff Area=40,674 sf 100.00% Impervious Runoff Depth>2.85"  
Tc=6.0 min CN=98 Runoff=2.72 cfs 9,647 cf

**Subcatchment 6AB:** Runoff Area=20,940 sf 100.00% Impervious Runoff Depth>2.85"  
Tc=6.0 min CN=98 Runoff=1.40 cfs 4,967 cf

**Subcatchment 7A:** Runoff Area=82,993 sf 1.76% Impervious Runoff Depth>0.36"  
Flow Length=291' Tc=21.0 min UI Adjusted CN=60 Runoff=0.32 cfs 2,487 cf

**Subcatchment 8A:** Runoff Area=71,488 sf 15.97% Impervious Runoff Depth>0.85"  
Flow Length=213' Tc=20.0 min CN=72 Runoff=1.00 cfs 5,073 cf

**Subcatchment 9A:** Runoff Area=29,202 sf 0.00% Impervious Runoff Depth>0.24"  
Flow Length=302' Tc=21.2 min CN=56 Runoff=0.06 cfs 585 cf

**Subcatchment 10A:** Runoff Area=24,266 sf 0.00% Impervious Runoff Depth>0.43"  
Flow Length=220' Tc=21.1 min CN=62 Runoff=0.12 cfs 864 cf

**Pond 1W: W1** Peak Elev=29.03' Storage=5 cf Inflow=1.42 cfs 5,831 cf  
Primary=1.41 cfs 5,830 cf Secondary=0.00 cfs 0 cf Outflow=1.41 cfs 5,830 cf

**Pond 2P: DMH3009** Peak Elev=26.92' Inflow=1.41 cfs 5,830 cf  
12.0" Round Culvert n=0.013 L=20.0' S=0.0940 '/' Outflow=1.41 cfs 5,830 cf

**Pond 3P: Wetland outlet** Peak Elev=34.44' Inflow=0.49 cfs 2,498 cf  
8.0" Round Culvert n=0.025 L=156.0' S=0.0363 '/' Outflow=0.49 cfs 2,498 cf

**Pond 4P: Wetland outlet behind buidling** Peak Elev=33.47' Inflow=2.73 cfs 11,207 cf  
15.0" Round Culvert n=0.025 L=136.0' S=0.0235 '/' Outflow=2.73 cfs 11,207 cf

**45659-51 Pre SSS**

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Type III 24-hr 1yr24hr Rainfall=3.08"

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**Pond 5P: CB3001**

Peak Elev=30.50' Inflow=0.85 cfs 4,600 cf  
8.0" Round Culvert n=0.025 L=82.0' S=0.0041 '/' Outflow=0.85 cfs 4,600 cf

**Pond 6P: CB??**

Peak Elev=28.88' Inflow=0.85 cfs 4,600 cf  
15.0" Round Culvert n=0.025 L=75.0' S=0.0011 '/' Outflow=0.85 cfs 4,600 cf

**Pond 7P: CB3005**

Peak Elev=25.68' Inflow=1.86 cfs 9,673 cf  
36.0" Round Culvert n=0.025 L=219.0' S=0.0200 '/' Outflow=1.86 cfs 9,673 cf

**Pond 8P: CB3008**

Peak Elev=21.10' Inflow=2.55 cfs 15,503 cf  
36.0" Round Culvert n=0.025 L=115.0' S=0.0207 '/' Outflow=2.55 cfs 15,503 cf

**Link L-D: HANNAFORD WETLAND**

Inflow=4.97 cfs 29,783 cf  
Primary=4.97 cfs 29,783 cf

**Link L-E: WETLAND POCKET**

Inflow=0.25 cfs 1,531 cf  
Primary=0.25 cfs 1,531 cf

**Link L-F: RTE 88 ROW**

Inflow=0.01 cfs 166 cf  
Primary=0.01 cfs 166 cf

**Total Runoff Area = 455,170 sf Runoff Volume = 31,479 cf Average Runoff Depth = 0.83"**  
**74.97% Pervious = 341,222 sf 25.03% Impervious = 113,948 sf**

**45659-51 Pre SSS**

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Type III 24-hr 2yr24hr Rainfall=3.70"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1A:** Runoff Area=9,261 sf 0.00% Impervious Runoff Depth>0.41"  
 Flow Length=138' Tc=18.6 min CN=55 Runoff=0.04 cfs 318 cf

**Subcatchment 1B:** Runoff Area=1,862 sf 0.00% Impervious Runoff Depth=0.00"  
 Tc=6.0 min CN=33 Runoff=0.00 cfs 0 cf

**Subcatchment 2A:** Runoff Area=52,064 sf 11.62% Impervious Runoff Depth>0.62"  
 Flow Length=532' Tc=21.8 min CN=60 Runoff=0.42 cfs 2,670 cf

**Subcatchment 3A:** Runoff Area=42,260 sf 31.25% Impervious Runoff Depth>1.07"  
 Flow Length=357' Tc=17.8 min CN=69 Runoff=0.79 cfs 3,772 cf

**Subcatchment 4A:** Runoff Area=43,490 sf 22.05% Impervious Runoff Depth>0.91"  
 Flow Length=513' Tc=18.6 min CN=66 Runoff=0.64 cfs 3,285 cf

**Subcatchment 5A:** Runoff Area=36,670 sf 28.94% Impervious Runoff Depth>0.80"  
 Flow Length=235' Tc=19.5 min CN=64 Runoff=0.45 cfs 2,457 cf

**Subcatchment 6A:** Runoff Area=40,674 sf 100.00% Impervious Runoff Depth>3.46"  
 Tc=6.0 min CN=98 Runoff=3.29 cfs 11,740 cf

**Subcatchment 6AB:** Runoff Area=20,940 sf 100.00% Impervious Runoff Depth>3.46"  
 Tc=6.0 min CN=98 Runoff=1.69 cfs 6,044 cf

**Subcatchment 7A:** Runoff Area=82,993 sf 1.76% Impervious Runoff Depth>0.62"  
 Flow Length=291' Tc=21.0 min UI Adjusted CN=60 Runoff=0.67 cfs 4,258 cf

**Subcatchment 8A:** Runoff Area=71,488 sf 15.97% Impervious Runoff Depth>1.25"  
 Flow Length=213' Tc=20.0 min CN=72 Runoff=1.54 cfs 7,432 cf

**Subcatchment 9A:** Runoff Area=29,202 sf 0.00% Impervious Runoff Depth>0.45"  
 Flow Length=302' Tc=21.2 min CN=56 Runoff=0.14 cfs 1,095 cf

**Subcatchment 10A:** Runoff Area=24,266 sf 0.00% Impervious Runoff Depth>0.71"  
 Flow Length=220' Tc=21.1 min CN=62 Runoff=0.24 cfs 1,429 cf

**Pond 1W: W1** Peak Elev=29.22' Storage=54 cf Inflow=1.75 cfs 7,473 cf  
 Primary=1.59 cfs 7,473 cf Secondary=0.00 cfs 0 cf Outflow=1.59 cfs 7,473 cf

**Pond 2P: DMH3009** Peak Elev=26.96' Inflow=1.59 cfs 7,473 cf  
 12.0" Round Culvert n=0.013 L=20.0' S=0.0940 ' Outflow=1.59 cfs 7,473 cf

**Pond 3P: Wetland outlet** Peak Elev=36.17' Inflow=0.79 cfs 3,772 cf  
 8.0" Round Culvert n=0.025 L=156.0' S=0.0363 ' Outflow=0.79 cfs 3,772 cf

**Pond 4P: Wetland outlet behind buidling** Peak Elev=33.59' Inflow=3.36 cfs 14,411 cf  
 15.0" Round Culvert n=0.025 L=136.0' S=0.0235 ' Outflow=3.36 cfs 14,411 cf

**45659-51 Pre SSS**

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Type III 24-hr 2yr24hr Rainfall=3.70"

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**Pond 5P: CB3001**

Peak Elev=33.65' Inflow=1.43 cfs 7,057 cf  
8.0" Round Culvert n=0.025 L=82.0' S=0.0041 '/' Outflow=1.43 cfs 7,057 cf

**Pond 6P: CB??**

Peak Elev=29.12' Inflow=1.43 cfs 7,057 cf  
15.0" Round Culvert n=0.025 L=75.0' S=0.0011 '/' Outflow=1.43 cfs 7,057 cf

**Pond 7P: CB3005**

Peak Elev=25.82' Inflow=2.97 cfs 14,489 cf  
36.0" Round Culvert n=0.025 L=219.0' S=0.0200 '/' Outflow=2.97 cfs 14,489 cf

**Pond 8P: CB3008**

Peak Elev=21.26' Inflow=4.11 cfs 21,962 cf  
36.0" Round Culvert n=0.025 L=115.0' S=0.0207 '/' Outflow=4.11 cfs 21,962 cf

**Link L-D: HANNAFORD WETLAND**

Inflow=6.69 cfs 41,726 cf  
Primary=6.69 cfs 41,726 cf

**Link L-E: WETLAND POCKET**

Inflow=0.45 cfs 2,457 cf  
Primary=0.45 cfs 2,457 cf

**Link L-F: RTE 88 ROW**

Inflow=0.04 cfs 318 cf  
Primary=0.04 cfs 318 cf

**Total Runoff Area = 455,170 sf Runoff Volume = 44,501 cf Average Runoff Depth = 1.17"**  
**74.97% Pervious = 341,222 sf 25.03% Impervious = 113,948 sf**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1A:** Runoff Area=9,261 sf 0.00% Impervious Runoff Depth>1.31"  
Flow Length=138' Tc=18.6 min CN=55 Runoff=0.20 cfs 1,014 cf

**Subcatchment 1B:** Runoff Area=1,862 sf 0.00% Impervious Runoff Depth>0.11"  
Tc=6.0 min CN=33 Runoff=0.00 cfs 18 cf

**Subcatchment 2A:** Runoff Area=52,064 sf 11.62% Impervious Runoff Depth>1.69"  
Flow Length=532' Tc=21.8 min CN=60 Runoff=1.43 cfs 7,319 cf

**Subcatchment 3A:** Runoff Area=42,260 sf 31.25% Impervious Runoff Depth>2.43"  
Flow Length=357' Tc=17.8 min CN=69 Runoff=1.93 cfs 8,568 cf

**Subcatchment 4A:** Runoff Area=43,490 sf 22.05% Impervious Runoff Depth>2.17"  
Flow Length=513' Tc=18.6 min CN=66 Runoff=1.72 cfs 7,882 cf

**Subcatchment 5A:** Runoff Area=36,670 sf 28.94% Impervious Runoff Depth>2.01"  
Flow Length=235' Tc=19.5 min CN=64 Runoff=1.29 cfs 6,136 cf

**Subcatchment 6A:** Runoff Area=40,674 sf 100.00% Impervious Runoff Depth>5.41"  
Tc=6.0 min CN=98 Runoff=5.05 cfs 18,334 cf

**Subcatchment 6AB:** Runoff Area=20,940 sf 100.00% Impervious Runoff Depth>5.41"  
Tc=6.0 min CN=98 Runoff=2.60 cfs 9,439 cf

**Subcatchment 7A:** Runoff Area=82,993 sf 1.76% Impervious Runoff Depth>1.69"  
Flow Length=291' Tc=21.0 min UI Adjusted CN=60 Runoff=2.31 cfs 11,669 cf

**Subcatchment 8A:** Runoff Area=71,488 sf 15.97% Impervious Runoff Depth>2.70"  
Flow Length=213' Tc=20.0 min CN=72 Runoff=3.48 cfs 16,075 cf

**Subcatchment 9A:** Runoff Area=29,202 sf 0.00% Impervious Runoff Depth>1.39"  
Flow Length=302' Tc=21.2 min CN=56 Runoff=0.63 cfs 3,371 cf

**Subcatchment 10A:** Runoff Area=24,266 sf 0.00% Impervious Runoff Depth>1.84"  
Flow Length=220' Tc=21.1 min CN=62 Runoff=0.75 cfs 3,731 cf

**Pond 1W: W1** Peak Elev=29.74' Storage=542 cf Inflow=2.93 cfs 13,169 cf  
Primary=1.99 cfs 13,169 cf Secondary=0.00 cfs 0 cf Outflow=1.99 cfs 13,169 cf

**Pond 2P: DMH3009** Peak Elev=27.04' Inflow=1.99 cfs 13,169 cf  
12.0" Round Culvert n=0.013 L=20.0' S=0.0940 '/' Outflow=1.99 cfs 13,169 cf

**Pond 3P: Wetland outlet** Peak Elev=74.85' Inflow=1.93 cfs 8,568 cf  
8.0" Round Culvert n=0.025 L=156.0' S=0.0363 '/' Outflow=1.93 cfs 8,568 cf

**Pond 4P: Wetland outlet behind buidling** Peak Elev=34.81' Inflow=5.63 cfs 25,652 cf  
15.0" Round Culvert n=0.025 L=136.0' S=0.0235 '/' Outflow=5.63 cfs 25,652 cf



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Type III 24-hr 10yr24hr Rainfall=5.65"

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**Pond 5P: CB3001**

Peak Elev=59.73' Inflow=3.64 cfs 16,450 cf  
8.0" Round Culvert n=0.025 L=82.0' S=0.0041 '/' Outflow=3.64 cfs 16,450 cf

**Pond 6P: CB??**

Peak Elev=30.30' Inflow=3.64 cfs 16,450 cf  
15.0" Round Culvert n=0.025 L=75.0' S=0.0011 '/' Outflow=3.64 cfs 16,450 cf

**Pond 7P: CB3005**

Peak Elev=26.19' Inflow=7.12 cfs 32,524 cf  
36.0" Round Culvert n=0.025 L=219.0' S=0.0200 '/' Outflow=7.12 cfs 32,524 cf

**Pond 8P: CB3008**

Peak Elev=21.66' Inflow=9.11 cfs 45,693 cf  
36.0" Round Culvert n=0.025 L=115.0' S=0.0207 '/' Outflow=9.11 cfs 45,693 cf

**Link L-D: HANNAFORD WETLAND**

Inflow=15.51 cfs 86,386 cf  
Primary=15.51 cfs 86,386 cf

**Link L-E: WETLAND POCKET**

Inflow=1.29 cfs 6,136 cf  
Primary=1.29 cfs 6,136 cf

**Link L-F: RTE 88 ROW**

Inflow=0.20 cfs 1,032 cf  
Primary=0.20 cfs 1,032 cf

**Total Runoff Area = 455,170 sf Runoff Volume = 93,554 cf Average Runoff Depth = 2.47"**  
**74.97% Pervious = 341,222 sf 25.03% Impervious = 113,948 sf**

**45659-51 Pre SSS**

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Type III 24-hr 25yr24hr Rainfall=7.19"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1A:** Runoff Area=9,261 sf 0.00% Impervious Runoff Depth>2.23"  
 Flow Length=138' Tc=18.6 min CN=55 Runoff=0.36 cfs 1,725 cf

**Subcatchment 1B:** Runoff Area=1,862 sf 0.00% Impervious Runoff Depth>0.42"  
 Tc=6.0 min CN=33 Runoff=0.01 cfs 65 cf

**Subcatchment 2A:** Runoff Area=52,064 sf 11.62% Impervious Runoff Depth>2.72"  
 Flow Length=532' Tc=21.8 min CN=60 Runoff=2.41 cfs 11,823 cf

**Subcatchment 3A:** Runoff Area=42,260 sf 31.25% Impervious Runoff Depth>3.66"  
 Flow Length=357' Tc=17.8 min CN=69 Runoff=2.93 cfs 12,881 cf

**Subcatchment 4A:** Runoff Area=43,490 sf 22.05% Impervious Runoff Depth>3.34"  
 Flow Length=513' Tc=18.6 min CN=66 Runoff=2.70 cfs 12,110 cf

**Subcatchment 5A:** Runoff Area=36,670 sf 28.94% Impervious Runoff Depth>3.13"  
 Flow Length=235' Tc=19.5 min CN=64 Runoff=2.08 cfs 9,575 cf

**Subcatchment 6A:** Runoff Area=40,674 sf 100.00% Impervious Runoff Depth>6.95"  
 Tc=6.0 min CN=98 Runoff=6.43 cfs 23,545 cf

**Subcatchment 6AB:** Runoff Area=20,940 sf 100.00% Impervious Runoff Depth>6.95"  
 Tc=6.0 min CN=98 Runoff=3.31 cfs 12,122 cf

**Subcatchment 7A:** Runoff Area=82,993 sf 1.76% Impervious Runoff Depth>2.73"  
 Flow Length=291' Tc=21.0 min UI Adjusted CN=60 Runoff=3.91 cfs 18,850 cf

**Subcatchment 8A:** Runoff Area=71,488 sf 15.97% Impervious Runoff Depth>3.98"  
 Flow Length=213' Tc=20.0 min CN=72 Runoff=5.16 cfs 23,688 cf

**Subcatchment 9A:** Runoff Area=29,202 sf 0.00% Impervious Runoff Depth>2.33"  
 Flow Length=302' Tc=21.2 min CN=56 Runoff=1.14 cfs 5,670 cf

**Subcatchment 10A:** Runoff Area=24,266 sf 0.00% Impervious Runoff Depth>2.93"  
 Flow Length=220' Tc=21.1 min CN=62 Runoff=1.24 cfs 5,920 cf

**Pond 1W: W1** Peak Elev=30.18' Storage=1,365 cf Inflow=3.93 cfs 18,042 cf  
 Primary=2.28 cfs 18,041 cf Secondary=0.00 cfs 0 cf Outflow=2.28 cfs 18,041 cf

**Pond 2P: DMH3009** Peak Elev=27.09' Inflow=2.28 cfs 18,041 cf  
 12.0" Round Culvert n=0.013 L=20.0' S=0.0940 '/' Outflow=2.28 cfs 18,041 cf

**Pond 3P: Wetland outlet** Peak Elev=136.95' Inflow=2.93 cfs 12,881 cf  
 8.0" Round Culvert n=0.025 L=156.0' S=0.0363 '/' Outflow=2.93 cfs 12,881 cf

**Pond 4P: Wetland outlet behind buidling** Peak Elev=38.18' Inflow=7.56 cfs 35,368 cf  
 15.0" Round Culvert n=0.025 L=136.0' S=0.0235 '/' Outflow=7.56 cfs 35,368 cf

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Type III 24-hr 25yr 24hr Rainfall=7.19"

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**Pond 5P: CB3001**

Peak Elev=101.93' Inflow=5.63 cfs 24,990 cf  
8.0" Round Culvert n=0.025 L=82.0' S=0.0041 '/' Outflow=5.63 cfs 24,990 cf

**Pond 6P: CB??**

Peak Elev=31.72' Inflow=5.63 cfs 24,990 cf  
15.0" Round Culvert n=0.025 L=75.0' S=0.0011 '/' Outflow=5.63 cfs 24,990 cf

**Pond 7P: CB3005**

Peak Elev=26.45' Inflow=10.78 cfs 48,678 cf  
36.0" Round Culvert n=0.025 L=219.0' S=0.0200 '/' Outflow=10.78 cfs 48,678 cf

**Pond 8P: CB3008**

Peak Elev=21.91' Inflow=13.04 cfs 66,719 cf  
36.0" Round Culvert n=0.025 L=115.0' S=0.0207 '/' Outflow=13.04 cfs 66,719 cf

**Link L-D: HANNAFORD WETLAND**

Inflow=23.14 cfs 126,607 cf  
Primary=23.14 cfs 126,607 cf

**Link L-E: WETLAND POCKET**

Inflow=2.08 cfs 9,575 cf  
Primary=2.08 cfs 9,575 cf

**Link L-F: RTE 88 ROW**

Inflow=0.37 cfs 1,789 cf  
Primary=0.37 cfs 1,789 cf

**Total Runoff Area = 455,170 sf Runoff Volume = 137,972 cf Average Runoff Depth = 3.64"**  
**74.97% Pervious = 341,222 sf 25.03% Impervious = 113,948 sf**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1A:** Runoff Area=9,261 sf 0.00% Impervious Runoff Depth>3.21"  
 Flow Length=138' Tc=18.6 min CN=55 Runoff=0.54 cfs 2,477 cf

**Subcatchment 1B:** Runoff Area=1,862 sf 0.00% Impervious Runoff Depth>0.84"  
 Tc=6.0 min CN=33 Runoff=0.02 cfs 130 cf

**Subcatchment 2A:** Runoff Area=52,064 sf 11.62% Impervious Runoff Depth>3.79"  
 Flow Length=532' Tc=21.8 min CN=60 Runoff=3.42 cfs 16,464 cf

**Subcatchment 3A:** Runoff Area=42,260 sf 31.25% Impervious Runoff Depth>4.87"  
 Flow Length=357' Tc=17.8 min CN=69 Runoff=3.92 cfs 17,164 cf

**Subcatchment 4A:** Runoff Area=43,490 sf 22.05% Impervious Runoff Depth>4.51"  
 Flow Length=513' Tc=18.6 min CN=66 Runoff=3.67 cfs 16,356 cf

**Subcatchment 5A:** Runoff Area=36,670 sf 28.94% Impervious Runoff Depth>4.27"  
 Flow Length=235' Tc=19.5 min CN=64 Runoff=2.87 cfs 13,057 cf

**Subcatchment 6A:** Runoff Area=40,674 sf 100.00% Impervious Runoff Depth>8.38"  
 Tc=6.0 min CN=98 Runoff=7.73 cfs 28,420 cf

**Subcatchment 6AB:** Runoff Area=20,940 sf 100.00% Impervious Runoff Depth>8.38"  
 Tc=6.0 min CN=98 Runoff=3.98 cfs 14,632 cf

**Subcatchment 7A:** Runoff Area=82,993 sf 1.76% Impervious Runoff Depth>3.80"  
 Flow Length=291' Tc=21.0 min UI Adjusted CN=60 Runoff=5.54 cfs 26,250 cf

**Subcatchment 8A:** Runoff Area=71,488 sf 15.97% Impervious Runoff Depth>5.23"  
 Flow Length=213' Tc=20.0 min CN=72 Runoff=6.80 cfs 31,171 cf

**Subcatchment 9A:** Runoff Area=29,202 sf 0.00% Impervious Runoff Depth>3.32"  
 Flow Length=302' Tc=21.2 min CN=56 Runoff=1.67 cfs 8,089 cf

**Subcatchment 10A:** Runoff Area=24,266 sf 0.00% Impervious Runoff Depth>4.03"  
 Flow Length=220' Tc=21.1 min CN=62 Runoff=1.73 cfs 8,155 cf

**Pond 1W: W1** Peak Elev=30.60' Storage=2,450 cf Inflow=4.88 cfs 22,787 cf  
 Primary=2.53 cfs 22,786 cf Secondary=0.00 cfs 0 cf Outflow=2.53 cfs 22,786 cf

**Pond 2P: DMH3009** Peak Elev=27.14' Inflow=2.53 cfs 22,786 cf  
 12.0" Round Culvert n=0.013 L=20.0' S=0.0940 '/' Outflow=2.53 cfs 22,786 cf

**Pond 3P: Wetland outlet** Peak Elev=223.65' Inflow=3.92 cfs 17,164 cf  
 8.0" Round Culvert n=0.025 L=156.0' S=0.0363 '/' Outflow=3.92 cfs 17,164 cf

**Pond 4P: Wetland outlet behind buidling** Peak Elev=42.37' Inflow=9.43 cfs 44,885 cf  
 15.0" Round Culvert n=0.025 L=136.0' S=0.0235 '/' Outflow=9.43 cfs 44,885 cf

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Type III 24-hr 50yr24hr Rainfall=8.63"

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**Pond 5P: CB3001**

Peak Elev=161.16' Inflow=7.58 cfs 33,519 cf  
8.0" Round Culvert n=0.025 L=82.0' S=0.0041 '/' Outflow=7.58 cfs 33,519 cf

**Pond 6P: CB??**

Peak Elev=33.73' Inflow=7.58 cfs 33,519 cf  
15.0" Round Culvert n=0.025 L=75.0' S=0.0011 '/' Outflow=7.58 cfs 33,519 cf

**Pond 7P: CB3005**

Peak Elev=26.67' Inflow=14.36 cfs 64,691 cf  
36.0" Round Culvert n=0.025 L=219.0' S=0.0200 '/' Outflow=14.36 cfs 64,691 cf

**Pond 8P: CB3008**

Peak Elev=22.12' Inflow=16.82 cfs 87,477 cf  
36.0" Round Culvert n=0.025 L=115.0' S=0.0207 '/' Outflow=16.82 cfs 87,477 cf

**Link L-D: HANNAFORD WETLAND**

Inflow=30.65 cfs 166,701 cf  
Primary=30.65 cfs 166,701 cf

**Link L-E: WETLAND POCKET**

Inflow=2.87 cfs 13,057 cf  
Primary=2.87 cfs 13,057 cf

**Link L-F: RTE 88 ROW**

Inflow=0.55 cfs 2,607 cf  
Primary=0.55 cfs 2,607 cf

**Total Runoff Area = 455,170 sf Runoff Volume = 182,365 cf Average Runoff Depth = 4.81"**  
**74.97% Pervious = 341,222 sf 25.03% Impervious = 113,948 sf**

**45659-51 Pre SSS**

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**Rainfall Events Listing (selected events)**

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10yr24hr	Type III 24-hr		Default	24.00	1	5.65	2

**Summary for Subcatchment 1A:**

Runoff = 0.20 cfs @ 12.30 hrs, Volume= 1,014 cf, Depth> 1.31"  
 Routed to Link L-F : RTE 88 ROW

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
9,261	55	Woods, Good, HSG B
9,261		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	100	0.0300	0.09		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.22"
0.4	38	0.1000	1.58		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
18.6	138	Total			

**Summary for Subcatchment 1B:**

Runoff = 0.00 cfs @ 14.92 hrs, Volume= 18 cf, Depth> 0.11"  
 Routed to Link L-F : RTE 88 ROW

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
1,303	30	Woods, Good, HSG A
559	39	>75% Grass cover, Good, HSG A
1,862	33	Weighted Average
1,862		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					<b>Direct Entry,</b>

**Summary for Subcatchment 2A:**

Runoff = 1.43 cfs @ 12.33 hrs, Volume= 7,319 cf, Depth> 1.69"  
 Routed to Pond 4P : Wetland outlet behind buidling

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

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Type III 24-hr 10yr24hr Rainfall=5.65"

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Area (sf)	CN	Description
23,812	55	Woods, Good, HSG B
2,957	96	Gravel surface, HSG B
6,051	98	Paved parking, HSG B
16,461	48	Brush, Good, HSG B
1,567	48	Brush, Good, HSG B
1,216	65	Brush, Good, HSG C
52,064	60	Weighted Average
46,013		88.38% Pervious Area
6,051		11.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	100	0.0300	0.09		<b>Sheet Flow, WOODS</b> Woods: Light underbrush n= 0.400 P2= 3.22"
1.3	138	0.1200	1.73		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
2.3	294	0.0120	2.09	2.61	<b>Trap/Vee/Rect Channel Flow, WETLAND POCKETS</b> Bot.W=1.00' D=0.50' Z= 3.0 '/' Top.W=4.00' n= 0.035 Earth, dense weeds
21.8	532	Total			

**Summary for Subcatchment 3A:**

Runoff = 1.93 cfs @ 12.26 hrs, Volume= 8,568 cf, Depth> 2.43"  
Routed to Pond 3P : Wetland outlet

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
9,199	55	Woods, Good, HSG B
6,263	61	>75% Grass cover, Good, HSG B
1,736	96	Gravel surface, HSG B
13,206	98	Paved parking, HSG B
9,727	48	Brush, Good, HSG B
1,629	65	Brush, Good, HSG C
500	30	Woods, Good, HSG A
42,260	69	Weighted Average
29,054		68.75% Pervious Area
13,206		31.25% Impervious Area



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Type III 24-hr 10yr24hr Rainfall=5.65"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0450	0.11		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.22"
1.1	95	0.0450	1.48		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.2	40	0.3250	2.85		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.0	122	0.0120	2.09	2.61	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=0.50' Z= 3.0 ' Top.W=4.00' n= 0.035 Earth, dense weeds
17.8	357	Total			

**Summary for Subcatchment 4A:**

Runoff = 1.72 cfs @ 12.27 hrs, Volume= 7,882 cf, Depth> 2.17"  
Routed to Pond 5P : CB3001

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
2,055	30	Woods, Good, HSG A
10,087	61	>75% Grass cover, Good, HSG B
942	96	Gravel surface, HSG B
8,295	39	>75% Grass cover, Good, HSG A
3,917	98	Paved parking, HSG D
2,911	80	>75% Grass cover, Good, HSG D
3,192	68	<50% Grass cover, Poor, HSG A
5,674	98	Paved parking, HSG B
5,371	55	Woods, Good, HSG B
1,046	79	<50% Grass cover, Poor, HSG B
43,490	66	Weighted Average
33,899		77.95% Pervious Area
9,591		22.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	85	0.0470	0.11		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.22"
2.8	176	0.0450	1.06		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
2.0	186	0.0500	1.57		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.4	66	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
18.6	513	Total			

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Type III 24-hr 10yr24hr Rainfall=5.65"

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**Summary for Subcatchment 5A:**

Runoff = 1.29 cfs @ 12.29 hrs, Volume= 6,136 cf, Depth> 2.01"  
 Routed to Link L-E : WETLAND POCKET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
1,578	74	>75% Grass cover, Good, HSG C
1,873	98	Paved parking, HSG B
8,740	98	Paved parking, HSG D
2,257	80	>75% Grass cover, Good, HSG D
12,207	39	>75% Grass cover, Good, HSG A
2,242	30	Woods, Good, HSG A
5,864	55	Woods, Good, HSG B
1,909	68	<50% Grass cover, Poor, HSG A
36,670	64	Weighted Average
26,057		71.06% Pervious Area
10,613		28.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	95	0.0100	0.09		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.22"
0.5	80	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
1.0	60	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
19.5	235	Total			

**Summary for Subcatchment 6A:**

Runoff = 5.05 cfs @ 12.09 hrs, Volume= 18,334 cf, Depth> 5.41"  
 Routed to Pond 4P : Wetland outlet behind buidling

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
29,692	98	Unconnected roofs, HSG B
10,982	98	Unconnected roofs, HSG B
40,674	98	Weighted Average
40,674		100.00% Impervious Area
40,674		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					<b>Direct Entry, roof</b>

**Summary for Subcatchment 6AB:**

Runoff = 2.60 cfs @ 12.09 hrs, Volume= 9,439 cf, Depth> 5.41"  
 Routed to Pond 1W : W1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
15,286	98	Unconnected roofs, HSG B
5,654	98	Unconnected roofs, HSG B
20,940	98	Weighted Average
20,940		100.00% Impervious Area
20,940		100.00% Unconnected

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

**Summary for Subcatchment 7A:**

Runoff = 2.31 cfs @ 12.32 hrs, Volume= 11,669 cf, Depth> 1.69"  
 Routed to Link L-D : HANNAFORD WETLAND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Adj	Description
8,759	70		Woods, Good, HSG C
36,741	55		Woods, Good, HSG B
25,670	61		>75% Grass cover, Good, HSG B
5,464	39		>75% Grass cover, Good, HSG A
4,902	96		Gravel surface, HSG B
1,457	98		Unconnected pavement, HSG B
82,993	61	60	Weighted Average, UI Adjusted
81,536			98.24% Pervious Area
1,457			1.76% Impervious Area
1,457			100.00% Unconnected

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Type III 24-hr 10yr24hr Rainfall=5.65"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0100	0.09		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.22"
1.1	70	0.0250	1.11		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.4	45	0.1600	2.00		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.5	34	0.0440	1.05		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.2	42	0.0120	3.76	12.21	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=6.00' D=0.50' Z= 1.0 '/' Top.W=7.00' n= 0.025 Earth, clean & winding
21.0	291	Total			

**Summary for Subcatchment 8A:**

Runoff = 3.48 cfs @ 12.28 hrs, Volume= 16,075 cf, Depth> 2.70"  
Routed to Pond 7P : CB3005

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
43,837	61	>75% Grass cover, Good, HSG B
14,097	80	>75% Grass cover, Good, HSG D
10,821	98	Paved parking, HSG D
2,138	96	Gravel surface, HSG B
50	98	Unconnected pavement, HSG B
545	98	Roofs, HSG D
71,488	72	Weighted Average
60,072		84.03% Pervious Area
11,416		15.97% Impervious Area
50		0.44% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0100	0.09		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.22"
0.9	87	0.0520	1.60		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.3	26	0.0400	1.40		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
20.0	213	Total			

**Summary for Subcatchment 9A:**

[47] Hint: Peak is 236% of capacity of segment #3

Runoff = 0.63 cfs @ 12.34 hrs, Volume= 3,371 cf, Depth> 1.39"  
 Routed to Link L-D : HANNAFORD WETLAND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
1,292	74	>75% Grass cover, Good, HSG C
19,932	61	>75% Grass cover, Good, HSG B
7,978	39	>75% Grass cover, Good, HSG A
29,202	56	Weighted Average
29,202		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0100	0.09		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.22"
1.6	127	0.0350	1.31		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.8	75	0.0130	1.48	0.27	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.50' D=0.10' Z= 3.0 ' Top.W=2.10' n= 0.022 Earth, clean & straight
21.2	302	Total			

**Summary for Subcatchment 10A:**

Runoff = 0.75 cfs @ 12.32 hrs, Volume= 3,731 cf, Depth> 1.84"  
 Routed to Pond 1W : W1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
161	74	>75% Grass cover, Good, HSG C
11,128	80	>75% Grass cover, Good, HSG D
8,937	39	>75% Grass cover, Good, HSG A
4,040	61	>75% Grass cover, Good, HSG B
24,266	62	Weighted Average
24,266		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0100	0.09		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.22"
2.3	120	0.0160	0.89		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
21.1	220	Total			

**Summary for Pond 1W: W1**

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=32)

Inflow Area = 45,206 sf, 46.32% Impervious, Inflow Depth > 3.50" for 10yr24hr event  
 Inflow = 2.93 cfs @ 12.09 hrs, Volume= 13,169 cf  
 Outflow = 1.99 cfs @ 12.23 hrs, Volume= 13,169 cf, Atten= 32%, Lag= 8.3 min  
 Primary = 1.99 cfs @ 12.23 hrs, Volume= 13,169 cf  
 Routed to Pond 2P : DMH3009  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
 Routed to Link L-D : HANNAFORD WETLAND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 29.74' @ 12.23 hrs Surf.Area= 1,450 sf Storage= 542 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)  
 Center-of-Mass det. time= 1.0 min ( 782.5 - 781.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	22,530 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
28.00	4	0	0
29.00	4	4	4
30.00	1,960	982	986
31.00	3,615	2,788	3,774
32.00	4,758	4,187	7,960
33.00	5,649	5,204	13,164
34.00	6,542	6,096	19,259
34.50	6,542	3,271	22,530

Device	Routing	Invert	Outlet Devices
#1	Primary	28.00'	<b>15.0" Round Culvert</b> L= 160.0' Ke= 0.050 Inlet / Outlet Invert= 28.00' / 26.41' S= 0.0099 1/ S Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	28.00'	<b>8.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	33.00'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Secondary	34.00'	<b>88.0' long + 1.0 1/ SideZ x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

**Primary OutFlow** Max=1.99 cfs @ 12.23 hrs HW=29.74' TW=27.04' (Dynamic Tailwater)

- ↑ 1=Culvert (Passes 1.99 cfs of 6.49 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 1.99 cfs @ 5.71 fps)
- ↑ 3=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=28.00' TW=0.00' (Dynamic Tailwater)

- ↑ 4=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

### Summary for Pond 2P: DMH3009

[57] Hint: Peaked at 27.04' (Flood elevation advised)

Inflow Area = 45,206 sf, 46.32% Impervious, Inflow Depth > 3.50" for 10yr24hr event  
 Inflow = 1.99 cfs @ 12.23 hrs, Volume= 13,169 cf  
 Outflow = 1.99 cfs @ 12.23 hrs, Volume= 13,169 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 1.99 cfs @ 12.23 hrs, Volume= 13,169 cf  
 Routed to Pond 8P : CB3008

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 27.04' @ 12.23 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	26.41'	<b>12.0" Round Culvert</b> L= 20.0' Ke= 0.050 Inlet / Outlet Invert= 26.41' / 24.53' S= 0.0940 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

**Primary OutFlow** Max=1.99 cfs @ 12.23 hrs HW=27.04' TW=21.64' (Dynamic Tailwater)  
 ↑1=Culvert (Inlet Controls 1.99 cfs @ 3.85 fps)

### Summary for Pond 3P: Wetland outlet

[57] Hint: Peaked at 74.85' (Flood elevation advised)

Inflow Area = 42,260 sf, 31.25% Impervious, Inflow Depth > 2.43" for 10yr24hr event  
 Inflow = 1.93 cfs @ 12.26 hrs, Volume= 8,568 cf  
 Outflow = 1.93 cfs @ 12.26 hrs, Volume= 8,568 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 1.93 cfs @ 12.26 hrs, Volume= 8,568 cf  
 Routed to Pond 5P : CB3001

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 74.85' @ 12.26 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	<b>8.0" Round Culvert</b> L= 156.0' Ke= 0.050 Inlet / Outlet Invert= 34.00' / 28.34' S= 0.0363 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf

**Primary OutFlow** Max=1.91 cfs @ 12.26 hrs HW=74.38' TW=59.40' (Dynamic Tailwater)  
 ↑1=Culvert (Outlet Controls 1.91 cfs @ 5.48 fps)

### Summary for Pond 4P: Wetland outlet behind buidling

[57] Hint: Peaked at 34.81' (Flood elevation advised)

Inflow Area = 92,738 sf, 50.38% Impervious, Inflow Depth > 3.32" for 10yr24hr event  
 Inflow = 5.63 cfs @ 12.09 hrs, Volume= 25,652 cf  
 Outflow = 5.63 cfs @ 12.09 hrs, Volume= 25,652 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 5.63 cfs @ 12.09 hrs, Volume= 25,652 cf  
 Routed to Link L-D : HANNAFORD WETLAND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 34.81' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	32.60'	<b>15.0" Round Culvert</b> L= 136.0' Ke= 0.050 Inlet / Outlet Invert= 32.60' / 29.40' S= 0.0235 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

**Primary OutFlow** Max=5.55 cfs @ 12.09 hrs HW=34.71' TW=0.00' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 5.55 cfs @ 4.52 fps)

### Summary for Pond 5P: CB3001

[57] Hint: Peaked at 59.73' (Flood elevation advised)

Inflow Area = 85,750 sf, 26.59% Impervious, Inflow Depth > 2.30" for 10yr24hr event  
 Inflow = 3.64 cfs @ 12.26 hrs, Volume= 16,450 cf  
 Outflow = 3.64 cfs @ 12.26 hrs, Volume= 16,450 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 3.64 cfs @ 12.26 hrs, Volume= 16,450 cf  
 Routed to Pond 6P : CB??

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 59.73' @ 12.26 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	28.54'	<b>8.0" Round Culvert</b> L= 82.0' Ke= 0.050 Inlet / Outlet Invert= 28.54' / 28.20' S= 0.0041 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf

**Primary OutFlow** Max=3.61 cfs @ 12.26 hrs HW=59.25' TW=30.28' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 3.61 cfs @ 10.35 fps)

### Summary for Pond 6P: CB??

[57] Hint: Peaked at 30.30' (Flood elevation advised)

Inflow Area = 85,750 sf, 26.59% Impervious, Inflow Depth > 2.30" for 10yr24hr event  
 Inflow = 3.64 cfs @ 12.26 hrs, Volume= 16,450 cf  
 Outflow = 3.64 cfs @ 12.26 hrs, Volume= 16,450 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 3.64 cfs @ 12.26 hrs, Volume= 16,450 cf  
 Routed to Pond 7P : CB3005

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 30.30' @ 12.26 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	28.10'	<b>15.0" Round Culvert</b> L= 75.0' Ke= 0.050 Inlet / Outlet Invert= 28.10' / 28.02' S= 0.0011 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf



**Primary OutFlow** Max=3.61 cfs @ 12.26 hrs HW=30.28' TW=26.19' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 3.61 cfs @ 2.95 fps)

### Summary for Pond 7P: CB3005

[57] Hint: Peaked at 26.19' (Flood elevation advised)

Inflow Area = 157,238 sf, 21.76% Impervious, Inflow Depth > 2.48" for 10yr24hr event  
 Inflow = 7.12 cfs @ 12.27 hrs, Volume= 32,524 cf  
 Outflow = 7.12 cfs @ 12.27 hrs, Volume= 32,524 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 7.12 cfs @ 12.27 hrs, Volume= 32,524 cf  
 Routed to Pond 8P : CB3008

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 26.19' @ 12.27 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	25.15'	<b>36.0" Round Culvert</b> L= 219.0' Ke= 0.050 Inlet / Outlet Invert= 25.15' / 20.76' S= 0.0200 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf

**Primary OutFlow** Max=7.05 cfs @ 12.27 hrs HW=26.19' TW=21.65' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 7.05 cfs @ 4.83 fps)

### Summary for Pond 8P: CB3008

[57] Hint: Peaked at 21.66' (Flood elevation advised)

Inflow Area = 202,444 sf, 27.24% Impervious, Inflow Depth > 2.71" for 10yr24hr event  
 Inflow = 9.11 cfs @ 12.27 hrs, Volume= 45,693 cf  
 Outflow = 9.11 cfs @ 12.27 hrs, Volume= 45,693 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 9.11 cfs @ 12.27 hrs, Volume= 45,693 cf  
 Routed to Link L-D : HANNAFORD WETLAND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 21.66' @ 12.27 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	20.48'	<b>36.0" Round Culvert</b> L= 115.0' Ke= 0.050 Inlet / Outlet Invert= 20.48' / 18.10' S= 0.0207 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf

**Primary OutFlow** Max=9.04 cfs @ 12.27 hrs HW=21.65' TW=0.00' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 9.04 cfs @ 5.23 fps)

**Summary for Link L-D: HANNAFORD WETLAND**

Inflow Area = 407,377 sf, 25.37% Impervious, Inflow Depth > 2.54" for 10yr24hr event  
Inflow = 15.51 cfs @ 12.27 hrs, Volume= 86,386 cf  
Primary = 15.51 cfs @ 12.27 hrs, Volume= 86,386 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

**Summary for Link L-E: WETLAND POCKET**

Inflow Area = 36,670 sf, 28.94% Impervious, Inflow Depth > 2.01" for 10yr24hr event  
Inflow = 1.29 cfs @ 12.29 hrs, Volume= 6,136 cf  
Primary = 1.29 cfs @ 12.29 hrs, Volume= 6,136 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

**Summary for Link L-F: RTE 88 ROW**

Inflow Area = 11,123 sf, 0.00% Impervious, Inflow Depth > 1.11" for 10yr24hr event  
Inflow = 0.20 cfs @ 12.30 hrs, Volume= 1,032 cf  
Primary = 0.20 cfs @ 12.30 hrs, Volume= 1,032 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs



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**Rainfall Events Listing (selected events)**

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2yr24hr	Type III 24-hr		Default	24.00	1	3.70	2
2	10yr24hr	Type III 24-hr		Default	24.00	1	5.65	2
3	25yr24hr	Type III 24-hr		Default	24.00	1	7.19	2
4	50yr24hr	Type III 24-hr		Default	24.00	1	8.63	2

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**Area Listing (all nodes)**

Area (sq-ft)	CN	Description (subcatchment-numbers)
17,206	39	>75% Grass cover, Good, HSG A (8D, 9D, 11D, 12D, 13D, 24D, 25D)
81,208	61	>75% Grass cover, Good, HSG B (2D, 3D, 4D, 5D, 8D, 9D, 10D, 11D, 12D, 13D, 14D, 17D, 21D, 23D, 24D, 25D)
3,414	74	>75% Grass cover, Good, HSG C (2D, 9D, 12D, 17D, 24D)
31,116	80	>75% Grass cover, Good, HSG D (12D, 13D, 14D, 24D)
1,822	96	Gravel surface, HSG A (24D, 25D)
10,118	96	Gravel surface, HSG B (2D, 3D, 25D)
28,217	98	Paved parking, HSG A (5D, 7D, 8D, 9D, 11D, 21D, 22D)
76,549	98	Paved parking, HSG B (3D, 4D, 5D, 7D, 8D, 9D, 10D, 11D, 13D, 15D, 16D, 18D, 19D, 20D, 21D, 22D, 23D)
2,462	98	Paved parking, HSG C (3D, 4D, 5D, 11D, 19D)
22,755	98	Paved parking, HSG D (12D, 13D, 14D)
545	98	Roofs, HSG D (14D)
622	98	Unconnected pavement, HSG A (9D, 11D)
4,137	98	Unconnected pavement, HSG B (10D, 23D, 25D)
101,605	98	Unconnected roofs, HSG B (6D, 6D-2, 6DB)
6,774	30	Woods, Good, HSG A (5D, 8D, 9D, 11D, 12D)
57,246	55	Woods, Good, HSG B (1D, 2D, 3D, 4D, 5D, 12D, 25D)
8,759	70	Woods, Good, HSG C (25D)
<b>454,555</b>	<b>81</b>	<b>TOTAL AREA</b>

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**Soil Listing (all nodes)**

Area (sq-ft)	Soil Group	Subcatchment Numbers
54,641	HSG A	5D, 7D, 8D, 9D, 11D, 12D, 13D, 21D, 22D, 24D, 25D
330,863	HSG B	1D, 2D, 3D, 4D, 5D, 6D, 6D-2, 6DB, 7D, 8D, 9D, 10D, 11D, 12D, 13D, 14D, 15D, 16D, 17D, 18D, 19D, 20D, 21D, 22D, 23D, 24D, 25D
14,635	HSG C	2D, 3D, 4D, 5D, 9D, 11D, 12D, 17D, 19D, 24D, 25D
54,416	HSG D	12D, 13D, 14D, 24D
0	Other	
<b>454,555</b>		<b>TOTAL AREA</b>

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**Ground Covers (all nodes)**

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
17,206	81,208	3,414	31,116	0	132,944	>75% Grass cover, Good	
1,822	10,118	0	0	0	11,940	Gravel surface	
28,217	76,549	2,462	22,755	0	129,983	Paved parking	
0	0	0	545	0	545	Roofs	
622	4,137	0	0	0	4,759	Unconnected pavement	
0	101,605	0	0	0	101,605	Unconnected roofs	
6,774	57,246	8,759	0	0	72,779	Woods, Good	
<b>54,641</b>	<b>330,863</b>	<b>14,635</b>	<b>54,416</b>	<b>0</b>	<b>454,555</b>	<b>TOTAL AREA</b>	

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**Pipe Listing (all nodes)**

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	1W	28.00	26.41	160.0	0.0099	0.013	0.0	12.0	0.0
2	4P	32.60	29.40	136.0	0.0235	0.025	0.0	15.0	0.0
3	CB1	38.45	38.23	22.0	0.0100	0.013	0.0	15.0	0.0
4	CB10	33.05	32.10	95.0	0.0100	0.013	0.0	15.0	0.0
5	CB11	29.30	28.47	83.0	0.0100	0.013	0.0	24.0	0.0
6	CB13	27.35	25.65	170.0	0.0100	0.013	0.0	24.0	0.0
7	CB14	25.75	25.65	53.0	0.0019	0.013	0.0	24.0	0.0
8	CB15	25.65	25.65	14.0	0.0000	0.013	0.0	24.0	0.0
9	CB16	27.70	26.33	33.0	0.0415	0.013	0.0	15.0	0.0
10	CB17	29.78	28.34	77.0	0.0187	0.013	0.0	15.0	0.0
11	CB18	30.10	29.88	22.0	0.0100	0.013	0.0	15.0	0.0
12	CB2	38.13	33.55	133.0	0.0344	0.013	0.0	15.0	0.0
13	CB20	28.54	25.58	99.0	0.0299	0.013	0.0	15.0	0.0
14	CB22	29.75	29.51	24.0	0.0100	0.013	0.0	15.0	0.0
15	CB3	33.65	32.59	106.0	0.0100	0.013	0.0	15.0	0.0
16	CB4	32.49	32.07	41.4	0.0101	0.013	0.0	15.0	0.0
17	CB5	31.97	31.65	32.0	0.0100	0.013	0.0	18.0	0.0
18	CB6	31.55	31.20	35.0	0.0100	0.013	0.0	18.0	0.0
19	CB7	31.10	30.78	32.0	0.0100	0.013	0.0	18.0	0.0
20	CB8	30.68	29.76	92.0	0.0100	0.013	0.0	18.0	0.0
21	CB9	29.66	29.40	26.0	0.0100	0.013	0.0	18.0	0.0
22	CBTD	30.80	28.82	89.0	0.0222	0.013	0.0	15.0	0.0
23	DMH12	28.37	27.45	92.0	0.0100	0.013	0.0	24.0	0.0
24	DMH21	25.48	25.13	35.0	0.0100	0.013	0.0	15.0	0.0
25	DMH23	25.03	24.64	39.0	0.0100	0.013	0.0	18.0	0.0
26	DMH24	24.54	23.43	111.0	0.0100	0.013	0.0	24.0	0.0
27	DMH25	23.33	22.05	128.0	0.0100	0.013	0.0	36.0	0.0
28	DMH26	21.95	20.99	104.0	0.0092	0.013	0.0	36.0	0.0
29	DMH27	20.89	20.63	26.0	0.0100	0.013	0.0	36.0	0.0
30	DMH28	20.53	19.68	75.0	0.0113	0.013	0.0	36.0	0.0
31	DMH29	19.68	18.10	75.0	0.0211	0.013	0.0	36.0	0.0
32	ST1	28.30	27.95	18.0	0.0194	0.013	0.0	18.0	0.0
33	ST1	21.80	21.70	10.0	0.0100	0.013	0.0	6.0	0.0



**45659-51 Post SSS**

Prepared by TF Moran, INC

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Type III 24-hr 2yr24hr Rainfall=3.70"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

<b>Subcatchment 1D:</b>	Runoff Area=9,261 sf 0.00% Impervious Runoff Depth>0.41" Flow Length=138' Tc=18.6 min CN=55 Runoff=0.04 cfs 318 cf
<b>Subcatchment 2D:</b>	Runoff Area=14,805 sf 0.00% Impervious Runoff Depth>1.02" Flow Length=262' Tc=12.2 min CN=68 Runoff=0.30 cfs 1,254 cf
<b>Subcatchment 3D:</b>	Runoff Area=10,406 sf 28.43% Impervious Runoff Depth>1.13" Flow Length=180' Tc=13.9 min CN=70 Runoff=0.23 cfs 980 cf
<b>Subcatchment 4D:</b>	Runoff Area=10,009 sf 29.63% Impervious Runoff Depth>1.13" Flow Length=200' Tc=14.1 min CN=70 Runoff=0.22 cfs 942 cf
<b>Subcatchment 5D:</b>	Runoff Area=47,893 sf 35.82% Impervious Runoff Depth>1.19" Flow Length=216' Tc=15.9 min CN=71 Runoff=1.06 cfs 4,743 cf
<b>Subcatchment 6D:</b>	Runoff Area=40,674 sf 100.00% Impervious Runoff Depth>3.46" Tc=6.0 min CN=98 Runoff=3.29 cfs 11,740 cf
<b>Subcatchment 6D-2: proposed building</b>	Runoff Area=39,991 sf 100.00% Impervious Runoff Depth>3.46" Tc=6.0 min CN=98 Runoff=3.23 cfs 11,543 cf
<b>Subcatchment 6DB:</b>	Runoff Area=20,940 sf 100.00% Impervious Runoff Depth>3.46" Tc=6.0 min CN=98 Runoff=1.69 cfs 6,044 cf
<b>Subcatchment 7D:</b>	Runoff Area=3,514 sf 100.00% Impervious Runoff Depth>3.46" Tc=6.0 min CN=98 Runoff=0.28 cfs 1,014 cf
<b>Subcatchment 8D:</b>	Runoff Area=12,928 sf 22.59% Impervious Runoff Depth>0.58" Tc=6.0 min CN=59 Runoff=0.14 cfs 620 cf
<b>Subcatchment 9D:</b>	Runoff Area=23,240 sf 79.33% Impervious Runoff Depth>2.54" Flow Length=262' Tc=7.4 min CN=89 Runoff=1.48 cfs 4,919 cf
<b>Subcatchment 10D:</b>	Runoff Area=7,314 sf 79.04% Impervious Runoff Depth>2.63" Tc=6.0 min CN=90 Runoff=0.50 cfs 1,605 cf
<b>Subcatchment 11D:</b>	Runoff Area=17,577 sf 77.58% Impervious Runoff Depth>2.45" Flow Length=388' Tc=13.1 min CN=88 Runoff=0.91 cfs 3,584 cf
<b>Subcatchment 12D:</b>	Runoff Area=21,194 sf 38.33% Impervious Runoff Depth>1.25" Flow Length=235' Tc=19.6 min CN=72 Runoff=0.46 cfs 2,204 cf
<b>Subcatchment 13D:</b>	Runoff Area=8,350 sf 47.44% Impervious Runoff Depth>2.02" Flow Length=180' Slope=0.0200 '/ Tc=22.3 min CN=83 Runoff=0.29 cfs 1,405 cf
<b>Subcatchment 14D:</b>	Runoff Area=28,275 sf 40.11% Impervious Runoff Depth>2.17" Flow Length=263' Tc=41.9 min CN=85 Runoff=0.80 cfs 5,121 cf

<b>Subcatchment 15D:</b>	Runoff Area=1,002 sf 100.00% Impervious Runoff Depth>3.46" Tc=6.0 min CN=98 Runoff=0.08 cfs 289 cf
<b>Subcatchment 16D:</b>	Runoff Area=4,641 sf 100.00% Impervious Runoff Depth>3.46" Tc=6.0 min CN=98 Runoff=0.37 cfs 1,340 cf
<b>Subcatchment 17D:</b>	Runoff Area=9,437 sf 0.00% Impervious Runoff Depth>0.71" Tc=6.0 min CN=62 Runoff=0.14 cfs 559 cf
<b>Subcatchment 18D:</b>	Runoff Area=698 sf 100.00% Impervious Runoff Depth>3.47" Tc=0.0 min CN=98 Runoff=0.07 cfs 202 cf
<b>Subcatchment 19D:</b>	Runoff Area=547 sf 100.00% Impervious Runoff Depth>3.46" Tc=6.0 min CN=98 Runoff=0.04 cfs 158 cf
<b>Subcatchment 20D:</b>	Runoff Area=821 sf 100.00% Impervious Runoff Depth>3.47" Tc=0.0 min CN=98 Runoff=0.08 cfs 237 cf
<b>Subcatchment 21D:</b>	Runoff Area=23,183 sf 95.63% Impervious Runoff Depth>3.24" Tc=6.0 min CN=96 Runoff=1.82 cfs 6,261 cf
<b>Subcatchment 22D:</b>	Runoff Area=3,502 sf 100.00% Impervious Runoff Depth>3.46" Tc=6.0 min CN=98 Runoff=0.28 cfs 1,011 cf
<b>Subcatchment 23D:</b>	Runoff Area=14,243 sf 69.57% Impervious Runoff Depth>2.36" Tc=6.0 min CN=87 Runoff=0.88 cfs 2,802 cf
<b>Subcatchment 24D:</b>	Runoff Area=18,756 sf 0.00% Impervious Runoff Depth>1.19" Tc=6.0 min CN=71 Runoff=0.56 cfs 1,862 cf
<b>Subcatchment 25D:</b>	Runoff Area=61,354 sf 1.97% Impervious Runoff Depth>0.76" Tc=0.0 min CN=63 Runoff=1.18 cfs 3,883 cf
<b>Pond 1W: W1</b>	Peak Elev=29.43' Storage=188 cf Inflow=2.25 cfs 7,907 cf Primary=1.76 cfs 7,906 cf Secondary=0.00 cfs 0 cf Outflow=1.76 cfs 7,906 cf
<b>Pond 4P: Wetland outlet behind buidling</b>	Peak Elev=33.61' Inflow=3.49 cfs 12,994 cf 15.0" Round Culvert n=0.025 L=136.0' S=0.0235 '/' Outflow=3.49 cfs 12,994 cf
<b>Pond CB1:</b>	Peak Elev=38.64' Inflow=0.14 cfs 620 cf 15.0" Round Culvert n=0.013 L=22.0' S=0.0100 '/' Outflow=0.14 cfs 620 cf
<b>Pond CB10:</b>	Peak Elev=33.38' Inflow=0.50 cfs 1,605 cf 15.0" Round Culvert n=0.013 L=95.0' S=0.0100 '/' Outflow=0.50 cfs 1,605 cf
<b>Pond CB11:</b>	Peak Elev=30.17' Inflow=3.85 cfs 16,802 cf 24.0" Round Culvert n=0.013 L=83.0' S=0.0100 '/' Outflow=3.85 cfs 16,802 cf
<b>Pond CB13:</b>	Peak Elev=28.38' Inflow=5.09 cfs 21,210 cf 24.0" Round Culvert n=0.013 L=170.0' S=0.0100 '/' Outflow=5.09 cfs 21,210 cf
<b>Pond CB14:</b>	Peak Elev=27.68' Inflow=5.43 cfs 22,549 cf 24.0" Round Culvert n=0.013 L=53.0' S=0.0019 '/' Outflow=5.43 cfs 22,549 cf

<b>Pond CB15:</b>	Peak Elev=27.68' Inflow=5.41 cfs 19,254 cf 24.0" Round Culvert n=0.013 L=14.0' S=0.0000 '/' Outflow=5.41 cfs 19,254 cf
<b>Pond CB16:</b>	Peak Elev=29.16' Inflow=5.41 cfs 19,254 cf 15.0" Round Culvert n=0.013 L=33.0' S=0.0415 '/' Outflow=5.41 cfs 19,254 cf
<b>Pond CB17:</b>	Peak Elev=29.95' Inflow=0.14 cfs 439 cf 15.0" Round Culvert n=0.013 L=77.0' S=0.0187 '/' Outflow=0.14 cfs 439 cf
<b>Pond CB18:</b>	Peak Elev=30.23' Inflow=0.08 cfs 237 cf 15.0" Round Culvert n=0.013 L=22.0' S=0.0100 '/' Outflow=0.08 cfs 237 cf
<b>Pond CB2:</b>	Peak Elev=38.43' Inflow=0.41 cfs 1,634 cf 15.0" Round Culvert n=0.013 L=133.0' S=0.0344 '/' Outflow=0.41 cfs 1,634 cf
<b>Pond CB20:</b>	Peak Elev=28.79' Inflow=0.29 cfs 1,405 cf 15.0" Round Culvert n=0.013 L=99.0' S=0.0299 '/' Outflow=0.29 cfs 1,405 cf
<b>Pond CB22:</b>	Peak Elev=30.20' Inflow=0.80 cfs 5,121 cf 15.0" Round Culvert n=0.013 L=24.0' S=0.0100 '/' Outflow=0.80 cfs 5,121 cf
<b>Pond CB3:</b>	Peak Elev=33.88' Inflow=0.23 cfs 980 cf 15.0" Round Culvert n=0.013 L=106.0' S=0.0100 '/' Outflow=0.23 cfs 980 cf
<b>Pond CB4:</b>	Peak Elev=32.89' Inflow=0.45 cfs 1,922 cf 15.0" Round Culvert n=0.013 L=41.4' S=0.0101 '/' Outflow=0.45 cfs 1,922 cf
<b>Pond CB5:</b>	Peak Elev=32.67' Inflow=1.76 cfs 8,299 cf 18.0" Round Culvert n=0.013 L=32.0' S=0.0100 '/' Outflow=1.76 cfs 8,299 cf
<b>Pond CB6:</b>	Peak Elev=32.29' Inflow=1.76 cfs 8,299 cf 18.0" Round Culvert n=0.013 L=35.0' S=0.0100 '/' Outflow=1.76 cfs 8,299 cf
<b>Pond CB7:</b>	Peak Elev=32.00' Inflow=2.97 cfs 13,218 cf 18.0" Round Culvert n=0.013 L=32.0' S=0.0100 '/' Outflow=2.97 cfs 13,218 cf
<b>Pond CB8:</b>	Peak Elev=31.52' Inflow=2.97 cfs 13,218 cf 18.0" Round Culvert n=0.013 L=92.0' S=0.0100 '/' Outflow=2.97 cfs 13,218 cf
<b>Pond CB9:</b>	Peak Elev=30.59' Inflow=2.97 cfs 13,218 cf 18.0" Round Culvert n=0.013 L=26.0' S=0.0100 '/' Outflow=2.97 cfs 13,218 cf
<b>Pond CBTD:</b>	Peak Elev=31.79' Inflow=3.51 cfs 12,554 cf 15.0" Round Culvert n=0.013 L=89.0' S=0.0222 '/' Outflow=3.51 cfs 12,554 cf
<b>Pond DMH12:</b>	Peak Elev=29.30' Inflow=4.25 cfs 18,407 cf 24.0" Round Culvert n=0.013 L=92.0' S=0.0100 '/' Outflow=4.25 cfs 18,407 cf
<b>Pond DMH21:</b>	Peak Elev=25.74' Inflow=0.29 cfs 1,405 cf 15.0" Round Culvert n=0.013 L=35.0' S=0.0100 '/' Outflow=0.29 cfs 1,405 cf

**45659-51 Post SSS**

Prepared by TF Moran, INC

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Type III 24-hr 2yr24hr Rainfall=3.70"

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<b>Pond DMH23:</b>	Peak Elev=25.29' Inflow=0.29 cfs 1,405 cf 18.0" Round Culvert n=0.013 L=39.0' S=0.0100 '/' Outflow=0.29 cfs 1,405 cf
<b>Pond DMH24:</b>	Peak Elev=24.95' Inflow=1.01 cfs 6,526 cf 24.0" Round Culvert n=0.013 L=111.0' S=0.0100 '/' Outflow=1.01 cfs 6,526 cf
<b>Pond DMH25:</b>	Peak Elev=23.69' Inflow=1.01 cfs 6,526 cf 36.0" Round Culvert n=0.013 L=128.0' S=0.0100 '/' Outflow=1.01 cfs 6,526 cf
<b>Pond DMH26:</b>	Peak Elev=22.35' Inflow=1.13 cfs 12,756 cf 36.0" Round Culvert n=0.013 L=104.0' S=0.0092 '/' Outflow=1.13 cfs 12,756 cf
<b>Pond DMH27:</b>	Peak Elev=21.52' Inflow=2.51 cfs 20,663 cf 36.0" Round Culvert n=0.013 L=26.0' S=0.0100 '/' Outflow=2.51 cfs 20,663 cf
<b>Pond DMH28:</b>	Peak Elev=21.12' Inflow=2.51 cfs 20,663 cf 36.0" Round Culvert n=0.013 L=75.0' S=0.0113 '/' Outflow=2.51 cfs 20,663 cf
<b>Pond DMH29:</b>	Peak Elev=20.26' Inflow=2.51 cfs 20,663 cf 36.0" Round Culvert n=0.013 L=75.0' S=0.0211 '/' Outflow=2.51 cfs 20,663 cf
<b>Pond ST1:</b>	Peak Elev=27.68' Storage=35,575 cf Inflow=10.70 cfs 41,803 cf Primary=0.14 cfs 6,230 cf Secondary=0.00 cfs 0 cf Outflow=0.14 cfs 6,230 cf
<b>Link L-D: HANNAFORD WETLAND</b>	Inflow=6.72 cfs 38,545 cf Primary=6.72 cfs 38,545 cf
<b>Link L-E: WETLAND POCKET</b>	Inflow=0.46 cfs 2,204 cf Primary=0.46 cfs 2,204 cf
<b>Link L-F: RTE 88 ROW</b>	Inflow=0.04 cfs 318 cf Primary=0.04 cfs 318 cf

**Total Runoff Area = 454,555 sf Runoff Volume = 76,641 cf Average Runoff Depth = 2.02"**  
**47.88% Pervious = 217,663 sf 52.12% Impervious = 236,892 sf**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

<b>Subcatchment 1D:</b>	Runoff Area=9,261 sf 0.00% Impervious Runoff Depth>1.31" Flow Length=138' Tc=18.6 min CN=55 Runoff=0.20 cfs 1,014 cf
<b>Subcatchment 2D:</b>	Runoff Area=14,805 sf 0.00% Impervious Runoff Depth>2.35" Flow Length=262' Tc=12.2 min CN=68 Runoff=0.74 cfs 2,898 cf
<b>Subcatchment 3D:</b>	Runoff Area=10,406 sf 28.43% Impervious Runoff Depth>2.52" Flow Length=180' Tc=13.9 min CN=70 Runoff=0.54 cfs 2,188 cf
<b>Subcatchment 4D:</b>	Runoff Area=10,009 sf 29.63% Impervious Runoff Depth>2.52" Flow Length=200' Tc=14.1 min CN=70 Runoff=0.52 cfs 2,104 cf
<b>Subcatchment 5D:</b>	Runoff Area=47,893 sf 35.82% Impervious Runoff Depth>2.61" Flow Length=216' Tc=15.9 min CN=71 Runoff=2.47 cfs 10,420 cf
<b>Subcatchment 6D:</b>	Runoff Area=40,674 sf 100.00% Impervious Runoff Depth>5.41" Tc=6.0 min CN=98 Runoff=5.05 cfs 18,334 cf
<b>Subcatchment 6D-2: proposed building</b>	Runoff Area=39,991 sf 100.00% Impervious Runoff Depth>5.41" Tc=6.0 min CN=98 Runoff=4.96 cfs 18,026 cf
<b>Subcatchment 6DB:</b>	Runoff Area=20,940 sf 100.00% Impervious Runoff Depth>5.41" Tc=6.0 min CN=98 Runoff=2.60 cfs 9,439 cf
<b>Subcatchment 7D:</b>	Runoff Area=3,514 sf 100.00% Impervious Runoff Depth>5.41" Tc=6.0 min CN=98 Runoff=0.44 cfs 1,584 cf
<b>Subcatchment 8D:</b>	Runoff Area=12,928 sf 22.59% Impervious Runoff Depth>1.62" Tc=6.0 min CN=59 Runoff=0.51 cfs 1,742 cf
<b>Subcatchment 9D:</b>	Runoff Area=23,240 sf 79.33% Impervious Runoff Depth>4.39" Flow Length=262' Tc=7.4 min CN=89 Runoff=2.50 cfs 8,507 cf
<b>Subcatchment 10D:</b>	Runoff Area=7,314 sf 79.04% Impervious Runoff Depth>4.50" Tc=6.0 min CN=90 Runoff=0.83 cfs 2,744 cf
<b>Subcatchment 11D:</b>	Runoff Area=17,577 sf 77.58% Impervious Runoff Depth>4.28" Flow Length=388' Tc=13.1 min CN=88 Runoff=1.56 cfs 6,271 cf
<b>Subcatchment 12D:</b>	Runoff Area=21,194 sf 38.33% Impervious Runoff Depth>2.70" Flow Length=235' Tc=19.6 min CN=72 Runoff=1.04 cfs 4,766 cf
<b>Subcatchment 13D:</b>	Runoff Area=8,350 sf 47.44% Impervious Runoff Depth>3.75" Flow Length=180' Slope=0.0200 '/' Tc=22.3 min CN=83 Runoff=0.54 cfs 2,612 cf
<b>Subcatchment 14D:</b>	Runoff Area=28,275 sf 40.11% Impervious Runoff Depth>3.94" Flow Length=263' Tc=41.9 min CN=85 Runoff=1.44 cfs 9,293 cf

<b>Subcatchment 15D:</b>	Runoff Area=1,002 sf 100.00% Impervious Runoff Depth>5.41" Tc=6.0 min CN=98 Runoff=0.12 cfs 452 cf
<b>Subcatchment 16D:</b>	Runoff Area=4,641 sf 100.00% Impervious Runoff Depth>5.41" Tc=6.0 min CN=98 Runoff=0.58 cfs 2,092 cf
<b>Subcatchment 17D:</b>	Runoff Area=9,437 sf 0.00% Impervious Runoff Depth>1.85" Tc=6.0 min CN=62 Runoff=0.44 cfs 1,457 cf
<b>Subcatchment 18D:</b>	Runoff Area=698 sf 100.00% Impervious Runoff Depth>5.41" Tc=0.0 min CN=98 Runoff=0.10 cfs 315 cf
<b>Subcatchment 19D:</b>	Runoff Area=547 sf 100.00% Impervious Runoff Depth>5.41" Tc=6.0 min CN=98 Runoff=0.07 cfs 247 cf
<b>Subcatchment 20D:</b>	Runoff Area=821 sf 100.00% Impervious Runoff Depth>5.41" Tc=0.0 min CN=98 Runoff=0.12 cfs 370 cf
<b>Subcatchment 21D:</b>	Runoff Area=23,183 sf 95.63% Impervious Runoff Depth>5.18" Tc=6.0 min CN=96 Runoff=2.84 cfs 9,999 cf
<b>Subcatchment 22D:</b>	Runoff Area=3,502 sf 100.00% Impervious Runoff Depth>5.41" Tc=6.0 min CN=98 Runoff=0.43 cfs 1,579 cf
<b>Subcatchment 23D:</b>	Runoff Area=14,243 sf 69.57% Impervious Runoff Depth>4.18" Tc=6.0 min CN=87 Runoff=1.53 cfs 4,961 cf
<b>Subcatchment 24D:</b>	Runoff Area=18,756 sf 0.00% Impervious Runoff Depth>2.62" Tc=6.0 min CN=71 Runoff=1.29 cfs 4,090 cf
<b>Subcatchment 25D:</b>	Runoff Area=61,354 sf 1.97% Impervious Runoff Depth>1.94" Tc=0.0 min CN=63 Runoff=3.52 cfs 9,896 cf
<b>Pond 1W: W1</b>	Peak Elev=30.01' Storage=1,000 cf Inflow=3.88 cfs 13,529 cf Primary=2.17 cfs 13,543 cf Secondary=0.00 cfs 0 cf Outflow=2.17 cfs 13,543 cf
<b>Pond 4P: Wetland outlet behind buidling</b>	Peak Elev=34.78' Inflow=5.62 cfs 21,232 cf 15.0" Round Culvert n=0.025 L=136.0' S=0.0235 '/' Outflow=5.62 cfs 21,232 cf
<b>Pond CB1:</b>	Peak Elev=38.83' Inflow=0.51 cfs 1,742 cf 15.0" Round Culvert n=0.013 L=22.0' S=0.0100 '/' Outflow=0.51 cfs 1,742 cf
<b>Pond CB10:</b>	Peak Elev=33.48' Inflow=0.83 cfs 2,744 cf 15.0" Round Culvert n=0.013 L=95.0' S=0.0100 '/' Outflow=0.83 cfs 2,744 cf
<b>Pond CB11:</b>	Peak Elev=30.68' Inflow=7.67 cfs 32,817 cf 24.0" Round Culvert n=0.013 L=83.0' S=0.0100 '/' Outflow=7.67 cfs 32,817 cf
<b>Pond CB13:</b>	Peak Elev=28.94' Inflow=9.75 cfs 40,522 cf 24.0" Round Culvert n=0.013 L=170.0' S=0.0100 '/' Outflow=9.75 cfs 40,522 cf
<b>Pond CB14:</b>	Peak Elev=28.88' Inflow=10.28 cfs 42,614 cf 24.0" Round Culvert n=0.013 L=53.0' S=0.0019 '/' Outflow=10.28 cfs 42,614 cf

<b>Pond CB15:</b>	Peak Elev=28.88' Inflow=8.35 cfs 30,289 cf 24.0" Round Culvert n=0.013 L=14.0' S=0.0000 '/' Outflow=8.35 cfs 30,289 cf
<b>Pond CB16:</b>	Peak Elev=30.31' Inflow=8.35 cfs 30,289 cf 15.0" Round Culvert n=0.013 L=33.0' S=0.0415 '/' Outflow=8.35 cfs 30,289 cf
<b>Pond CB17:</b>	Peak Elev=30.29' Inflow=0.22 cfs 685 cf 15.0" Round Culvert n=0.013 L=77.0' S=0.0187 '/' Outflow=0.22 cfs 685 cf
<b>Pond CB18:</b>	Peak Elev=30.30' Inflow=0.12 cfs 370 cf 15.0" Round Culvert n=0.013 L=22.0' S=0.0100 '/' Outflow=0.12 cfs 370 cf
<b>Pond CB2:</b>	Peak Elev=38.59' Inflow=0.94 cfs 3,326 cf 15.0" Round Culvert n=0.013 L=133.0' S=0.0344 '/' Outflow=0.94 cfs 3,326 cf
<b>Pond CB20:</b>	Peak Elev=28.88' Inflow=0.54 cfs 2,612 cf 15.0" Round Culvert n=0.013 L=99.0' S=0.0299 '/' Outflow=0.54 cfs 2,612 cf
<b>Pond CB22:</b>	Peak Elev=30.38' Inflow=1.44 cfs 9,293 cf 15.0" Round Culvert n=0.013 L=24.0' S=0.0100 '/' Outflow=1.44 cfs 9,293 cf
<b>Pond CB3:</b>	Peak Elev=34.04' Inflow=0.54 cfs 2,188 cf 15.0" Round Culvert n=0.013 L=106.0' S=0.0100 '/' Outflow=0.54 cfs 2,188 cf
<b>Pond CB4:</b>	Peak Elev=33.36' Inflow=1.06 cfs 4,292 cf 15.0" Round Culvert n=0.013 L=41.4' S=0.0101 '/' Outflow=1.06 cfs 4,292 cf
<b>Pond CB5:</b>	Peak Elev=33.28' Inflow=4.09 cfs 18,039 cf 18.0" Round Culvert n=0.013 L=32.0' S=0.0100 '/' Outflow=4.09 cfs 18,039 cf
<b>Pond CB6:</b>	Peak Elev=32.92' Inflow=4.09 cfs 18,039 cf 18.0" Round Culvert n=0.013 L=35.0' S=0.0100 '/' Outflow=4.09 cfs 18,039 cf
<b>Pond CB7:</b>	Peak Elev=32.62' Inflow=6.14 cfs 26,546 cf 18.0" Round Culvert n=0.013 L=32.0' S=0.0100 '/' Outflow=6.14 cfs 26,546 cf
<b>Pond CB8:</b>	Peak Elev=32.09' Inflow=6.14 cfs 26,546 cf 18.0" Round Culvert n=0.013 L=92.0' S=0.0100 '/' Outflow=6.14 cfs 26,546 cf
<b>Pond CB9:</b>	Peak Elev=31.19' Inflow=6.14 cfs 26,546 cf 18.0" Round Culvert n=0.013 L=26.0' S=0.0100 '/' Outflow=6.14 cfs 26,546 cf
<b>Pond CBTD:</b>	Peak Elev=32.26' Inflow=5.40 cfs 19,604 cf 15.0" Round Culvert n=0.013 L=89.0' S=0.0222 '/' Outflow=5.40 cfs 19,604 cf
<b>Pond DMH12:</b>	Peak Elev=29.82' Inflow=8.33 cfs 35,561 cf 24.0" Round Culvert n=0.013 L=92.0' S=0.0100 '/' Outflow=8.33 cfs 35,561 cf
<b>Pond DMH21:</b>	Peak Elev=25.83' Inflow=0.54 cfs 2,612 cf 15.0" Round Culvert n=0.013 L=35.0' S=0.0100 '/' Outflow=0.54 cfs 2,612 cf

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Prepared by TF Moran, INC

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Type III 24-hr 10yr24hr Rainfall=5.65"

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<b>Pond DMH23:</b>	Peak Elev=25.40' Inflow=0.54 cfs 2,612 cf 18.0" Round Culvert n=0.013 L=39.0' S=0.0100 '/' Outflow=0.54 cfs 2,612 cf
<b>Pond DMH24:</b>	Peak Elev=25.10' Inflow=1.82 cfs 11,904 cf 24.0" Round Culvert n=0.013 L=111.0' S=0.0100 '/' Outflow=1.82 cfs 11,904 cf
<b>Pond DMH25:</b>	Peak Elev=23.82' Inflow=1.82 cfs 11,904 cf 36.0" Round Culvert n=0.013 L=128.0' S=0.0100 '/' Outflow=1.82 cfs 11,904 cf
<b>Pond DMH26:</b>	Peak Elev=22.57' Inflow=2.65 cfs 42,198 cf 36.0" Round Culvert n=0.013 L=104.0' S=0.0092 '/' Outflow=2.65 cfs 42,198 cf
<b>Pond DMH27:</b>	Peak Elev=21.72' Inflow=3.95 cfs 55,742 cf 36.0" Round Culvert n=0.013 L=26.0' S=0.0100 '/' Outflow=3.95 cfs 55,742 cf
<b>Pond DMH28:</b>	Peak Elev=21.28' Inflow=3.95 cfs 55,742 cf 36.0" Round Culvert n=0.013 L=75.0' S=0.0113 '/' Outflow=3.95 cfs 55,742 cf
<b>Pond DMH29:</b>	Peak Elev=20.42' Inflow=3.95 cfs 55,742 cf 36.0" Round Culvert n=0.013 L=75.0' S=0.0211 '/' Outflow=3.95 cfs 55,742 cf
<b>Pond ST1:</b>	Peak Elev=28.87' Storage=46,294 cf Inflow=18.37 cfs 72,903 cf Primary=0.15 cfs 7,285 cf Secondary=1.61 cfs 23,009 cf Outflow=1.75 cfs 30,294 cf
<b>Link L-D: HANNAFORD WETLAND</b>	Inflow=11.39 cfs 89,025 cf Primary=11.39 cfs 89,025 cf
<b>Link L-E: WETLAND POCKET</b>	Inflow=1.04 cfs 4,766 cf Primary=1.04 cfs 4,766 cf
<b>Link L-F: RTE 88 ROW</b>	Inflow=0.20 cfs 1,014 cf Primary=0.20 cfs 1,014 cf

**Total Runoff Area = 454,555 sf Runoff Volume = 137,399 cf Average Runoff Depth = 3.63"**  
**47.88% Pervious = 217,663 sf 52.12% Impervious = 236,892 sf**



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

<b>Subcatchment 1D:</b>	Runoff Area=9,261 sf 0.00% Impervious Runoff Depth>2.23" Flow Length=138' Tc=18.6 min CN=55 Runoff=0.36 cfs 1,725 cf
<b>Subcatchment 2D:</b>	Runoff Area=14,805 sf 0.00% Impervious Runoff Depth>3.56" Flow Length=262' Tc=12.2 min CN=68 Runoff=1.15 cfs 4,387 cf
<b>Subcatchment 3D:</b>	Runoff Area=10,406 sf 28.43% Impervious Runoff Depth>3.77" Flow Length=180' Tc=13.9 min CN=70 Runoff=0.82 cfs 3,267 cf
<b>Subcatchment 4D:</b>	Runoff Area=10,009 sf 29.63% Impervious Runoff Depth>3.77" Flow Length=200' Tc=14.1 min CN=70 Runoff=0.78 cfs 3,142 cf
<b>Subcatchment 5D:</b>	Runoff Area=47,893 sf 35.82% Impervious Runoff Depth>3.87" Flow Length=216' Tc=15.9 min CN=71 Runoff=3.69 cfs 15,455 cf
<b>Subcatchment 6D:</b>	Runoff Area=40,674 sf 100.00% Impervious Runoff Depth>6.95" Tc=6.0 min CN=98 Runoff=6.43 cfs 23,545 cf
<b>Subcatchment 6D-2: proposed building</b>	Runoff Area=39,991 sf 100.00% Impervious Runoff Depth>6.95" Tc=6.0 min CN=98 Runoff=6.32 cfs 23,150 cf
<b>Subcatchment 6DB:</b>	Runoff Area=20,940 sf 100.00% Impervious Runoff Depth>6.95" Tc=6.0 min CN=98 Runoff=3.31 cfs 12,122 cf
<b>Subcatchment 7D:</b>	Runoff Area=3,514 sf 100.00% Impervious Runoff Depth>6.95" Tc=6.0 min CN=98 Runoff=0.56 cfs 2,034 cf
<b>Subcatchment 8D:</b>	Runoff Area=12,928 sf 22.59% Impervious Runoff Depth>2.64" Tc=6.0 min CN=59 Runoff=0.87 cfs 2,840 cf
<b>Subcatchment 9D:</b>	Runoff Area=23,240 sf 79.33% Impervious Runoff Depth>5.89" Flow Length=262' Tc=7.4 min CN=89 Runoff=3.29 cfs 11,404 cf
<b>Subcatchment 10D:</b>	Runoff Area=7,314 sf 79.04% Impervious Runoff Depth>6.01" Tc=6.0 min CN=90 Runoff=1.09 cfs 3,660 cf
<b>Subcatchment 11D:</b>	Runoff Area=17,577 sf 77.58% Impervious Runoff Depth>5.77" Flow Length=388' Tc=13.1 min CN=88 Runoff=2.07 cfs 8,448 cf
<b>Subcatchment 12D:</b>	Runoff Area=21,194 sf 38.33% Impervious Runoff Depth>3.98" Flow Length=235' Tc=19.6 min CN=72 Runoff=1.54 cfs 7,023 cf
<b>Subcatchment 13D:</b>	Runoff Area=8,350 sf 47.44% Impervious Runoff Depth>5.19" Flow Length=180' Slope=0.0200 '/' Tc=22.3 min CN=83 Runoff=0.74 cfs 3,610 cf
<b>Subcatchment 14D:</b>	Runoff Area=28,275 sf 40.11% Impervious Runoff Depth>5.40" Flow Length=263' Tc=41.9 min CN=85 Runoff=1.94 cfs 12,715 cf

<b>Subcatchment 15D:</b>	Runoff Area=1,002 sf 100.00% Impervious Runoff Depth>6.95" Tc=6.0 min CN=98 Runoff=0.16 cfs 580 cf
<b>Subcatchment 16D:</b>	Runoff Area=4,641 sf 100.00% Impervious Runoff Depth>6.95" Tc=6.0 min CN=98 Runoff=0.73 cfs 2,687 cf
<b>Subcatchment 17D:</b>	Runoff Area=9,437 sf 0.00% Impervious Runoff Depth>2.94" Tc=6.0 min CN=62 Runoff=0.72 cfs 2,311 cf
<b>Subcatchment 18D:</b>	Runoff Area=698 sf 100.00% Impervious Runoff Depth>6.95" Tc=0.0 min CN=98 Runoff=0.13 cfs 404 cf
<b>Subcatchment 19D:</b>	Runoff Area=547 sf 100.00% Impervious Runoff Depth>6.95" Tc=6.0 min CN=98 Runoff=0.09 cfs 317 cf
<b>Subcatchment 20D:</b>	Runoff Area=821 sf 100.00% Impervious Runoff Depth>6.95" Tc=0.0 min CN=98 Runoff=0.15 cfs 476 cf
<b>Subcatchment 21D:</b>	Runoff Area=23,183 sf 95.63% Impervious Runoff Depth>6.71" Tc=6.0 min CN=96 Runoff=3.64 cfs 12,961 cf
<b>Subcatchment 22D:</b>	Runoff Area=3,502 sf 100.00% Impervious Runoff Depth>6.95" Tc=6.0 min CN=98 Runoff=0.55 cfs 2,027 cf
<b>Subcatchment 23D:</b>	Runoff Area=14,243 sf 69.57% Impervious Runoff Depth>5.66" Tc=6.0 min CN=87 Runoff=2.04 cfs 6,717 cf
<b>Subcatchment 24D:</b>	Runoff Area=18,756 sf 0.00% Impervious Runoff Depth>3.88" Tc=6.0 min CN=71 Runoff=1.92 cfs 6,065 cf
<b>Subcatchment 25D:</b>	Runoff Area=61,354 sf 1.97% Impervious Runoff Depth>3.04" Tc=0.0 min CN=63 Runoff=5.71 cfs 15,562 cf
<b>Pond 1W: W1</b>	Peak Elev=30.42' Storage=1,953 cf Inflow=5.23 cfs 18,187 cf Primary=2.43 cfs 18,186 cf Secondary=0.00 cfs 0 cf Outflow=2.43 cfs 18,186 cf
<b>Pond 4P: Wetland outlet behind buidling</b>	Peak Elev=37.73' Inflow=7.33 cfs 27,933 cf 15.0" Round Culvert n=0.025 L=136.0' S=0.0235 '/' Outflow=7.33 cfs 27,933 cf
<b>Pond CB1:</b>	Peak Elev=38.97' Inflow=0.87 cfs 2,840 cf 15.0" Round Culvert n=0.013 L=22.0' S=0.0100 '/' Outflow=0.87 cfs 2,840 cf
<b>Pond CB10:</b>	Peak Elev=33.55' Inflow=1.09 cfs 3,660 cf 15.0" Round Culvert n=0.013 L=95.0' S=0.0100 '/' Outflow=1.09 cfs 3,660 cf
<b>Pond CB11:</b>	Peak Elev=31.14' Inflow=10.90 cfs 46,588 cf 24.0" Round Culvert n=0.013 L=83.0' S=0.0100 '/' Outflow=10.90 cfs 46,588 cf
<b>Pond CB13:</b>	Peak Elev=30.04' Inflow=13.50 cfs 56,966 cf 24.0" Round Culvert n=0.013 L=170.0' S=0.0100 '/' Outflow=13.50 cfs 56,966 cf
<b>Pond CB14:</b>	Peak Elev=29.89' Inflow=14.32 cfs 59,652 cf 24.0" Round Culvert n=0.013 L=53.0' S=0.0019 '/' Outflow=14.32 cfs 59,652 cf

<b>Pond CB15:</b>	Peak Elev=29.77' Inflow=10.66 cfs 39,018 cf 24.0" Round Culvert n=0.013 L=14.0' S=0.0000 '/' Outflow=10.66 cfs 39,018 cf
<b>Pond CB16:</b>	Peak Elev=31.57' Inflow=10.66 cfs 39,018 cf 15.0" Round Culvert n=0.013 L=33.0' S=0.0415 '/' Outflow=10.66 cfs 39,018 cf
<b>Pond CB17:</b>	Peak Elev=31.57' Inflow=0.28 cfs 880 cf 15.0" Round Culvert n=0.013 L=77.0' S=0.0187 '/' Outflow=0.28 cfs 880 cf
<b>Pond CB18:</b>	Peak Elev=31.56' Inflow=0.15 cfs 476 cf 15.0" Round Culvert n=0.013 L=22.0' S=0.0100 '/' Outflow=0.15 cfs 476 cf
<b>Pond CB2:</b>	Peak Elev=38.71' Inflow=1.43 cfs 4,874 cf 15.0" Round Culvert n=0.013 L=133.0' S=0.0344 '/' Outflow=1.43 cfs 4,874 cf
<b>Pond CB20:</b>	Peak Elev=28.94' Inflow=0.74 cfs 3,610 cf 15.0" Round Culvert n=0.013 L=99.0' S=0.0299 '/' Outflow=0.74 cfs 3,610 cf
<b>Pond CB22:</b>	Peak Elev=30.50' Inflow=1.94 cfs 12,715 cf 15.0" Round Culvert n=0.013 L=24.0' S=0.0100 '/' Outflow=1.94 cfs 12,715 cf
<b>Pond CB3:</b>	Peak Elev=35.43' Inflow=0.82 cfs 3,267 cf 15.0" Round Culvert n=0.013 L=106.0' S=0.0100 '/' Outflow=0.82 cfs 3,267 cf
<b>Pond CB4:</b>	Peak Elev=35.35' Inflow=1.60 cfs 6,408 cf 15.0" Round Culvert n=0.013 L=41.4' S=0.0101 '/' Outflow=1.60 cfs 6,408 cf
<b>Pond CB5:</b>	Peak Elev=35.36' Inflow=6.14 cfs 26,737 cf 18.0" Round Culvert n=0.013 L=32.0' S=0.0100 '/' Outflow=6.14 cfs 26,737 cf
<b>Pond CB6:</b>	Peak Elev=34.81' Inflow=6.14 cfs 26,737 cf 18.0" Round Culvert n=0.013 L=35.0' S=0.0100 '/' Outflow=6.14 cfs 26,737 cf
<b>Pond CB7:</b>	Peak Elev=34.30' Inflow=8.86 cfs 38,140 cf 18.0" Round Culvert n=0.013 L=32.0' S=0.0100 '/' Outflow=8.86 cfs 38,140 cf
<b>Pond CB8:</b>	Peak Elev=33.35' Inflow=8.86 cfs 38,140 cf 18.0" Round Culvert n=0.013 L=92.0' S=0.0100 '/' Outflow=8.86 cfs 38,140 cf
<b>Pond CB9:</b>	Peak Elev=32.19' Inflow=8.86 cfs 38,140 cf 18.0" Round Culvert n=0.013 L=26.0' S=0.0100 '/' Outflow=8.86 cfs 38,140 cf
<b>Pond CBTD:</b>	Peak Elev=33.23' Inflow=6.88 cfs 25,177 cf 15.0" Round Culvert n=0.013 L=89.0' S=0.0222 '/' Outflow=6.88 cfs 25,177 cf
<b>Pond DMH12:</b>	Peak Elev=30.53' Inflow=11.76 cfs 50,249 cf 24.0" Round Culvert n=0.013 L=92.0' S=0.0100 '/' Outflow=11.76 cfs 50,249 cf
<b>Pond DMH21:</b>	Peak Elev=25.90' Inflow=0.74 cfs 3,610 cf 15.0" Round Culvert n=0.013 L=35.0' S=0.0100 '/' Outflow=0.74 cfs 3,610 cf

**45659-51 Post SSS**

Prepared by TF Moran, INC

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Type III 24-hr 25yr 24hr Rainfall=7.19"

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**Pond DMH23:** Peak Elev=25.47' Inflow=0.74 cfs 3,610 cf  
18.0" Round Culvert n=0.013 L=39.0' S=0.0100 '/' Outflow=0.74 cfs 3,610 cf

**Pond DMH24:** Peak Elev=25.19' Inflow=2.46 cfs 16,325 cf  
24.0" Round Culvert n=0.013 L=111.0' S=0.0100 '/' Outflow=2.46 cfs 16,325 cf

**Pond DMH25:** Peak Elev=24.00' Inflow=2.46 cfs 16,325 cf  
36.0" Round Culvert n=0.013 L=128.0' S=0.0100 '/' Outflow=2.46 cfs 16,325 cf

**Pond DMH26:** Peak Elev=23.31' Inflow=9.60 cfs 72,023 cf  
36.0" Round Culvert n=0.013 L=104.0' S=0.0092 '/' Outflow=9.60 cfs 72,023 cf

**Pond DMH27:** Peak Elev=22.50' Inflow=11.88 cfs 90,210 cf  
36.0" Round Culvert n=0.013 L=26.0' S=0.0100 '/' Outflow=11.88 cfs 90,210 cf

**Pond DMH28:** Peak Elev=21.96' Inflow=11.88 cfs 90,210 cf  
36.0" Round Culvert n=0.013 L=75.0' S=0.0113 '/' Outflow=11.88 cfs 90,210 cf

**Pond DMH29:** Peak Elev=21.01' Inflow=11.88 cfs 90,210 cf  
36.0" Round Culvert n=0.013 L=75.0' S=0.0211 '/' Outflow=11.88 cfs 90,210 cf

**Pond ST1:** Peak Elev=29.75' Storage=53,056 cf Inflow=24.62 cfs 98,670 cf  
Primary=0.15 cfs 7,697 cf Secondary=6.99 cfs 48,002 cf Outflow=7.14 cfs 55,699 cf

**Link L-D: HANNAFORD WETLAND** Inflow=15.31 cfs 136,912 cf  
Primary=15.31 cfs 136,912 cf

**Link L-E: WETLAND POCKET** Inflow=1.54 cfs 7,023 cf  
Primary=1.54 cfs 7,023 cf

**Link L-F: RTE 88 ROW** Inflow=0.36 cfs 1,725 cf  
Primary=0.36 cfs 1,725 cf

**Total Runoff Area = 454,555 sf Runoff Volume = 188,633 cf Average Runoff Depth = 4.98"**  
**47.88% Pervious = 217,663 sf 52.12% Impervious = 236,892 sf**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

<b>Subcatchment 1D:</b>	Runoff Area=9,261 sf 0.00% Impervious Runoff Depth>3.21" Flow Length=138' Tc=18.6 min CN=55 Runoff=0.54 cfs 2,477 cf
<b>Subcatchment 2D:</b>	Runoff Area=14,805 sf 0.00% Impervious Runoff Depth>4.76" Flow Length=262' Tc=12.2 min CN=68 Runoff=1.54 cfs 5,872 cf
<b>Subcatchment 3D:</b>	Runoff Area=10,406 sf 28.43% Impervious Runoff Depth>5.00" Flow Length=180' Tc=13.9 min CN=70 Runoff=1.09 cfs 4,334 cf
<b>Subcatchment 4D:</b>	Runoff Area=10,009 sf 29.63% Impervious Runoff Depth>5.00" Flow Length=200' Tc=14.1 min CN=70 Runoff=1.04 cfs 4,169 cf
<b>Subcatchment 5D:</b>	Runoff Area=47,893 sf 35.82% Impervious Runoff Depth>5.12" Flow Length=216' Tc=15.9 min CN=71 Runoff=4.88 cfs 20,419 cf
<b>Subcatchment 6D:</b>	Runoff Area=40,674 sf 100.00% Impervious Runoff Depth>8.38" Tc=6.0 min CN=98 Runoff=7.73 cfs 28,420 cf
<b>Subcatchment 6D-2: proposed building</b>	Runoff Area=39,991 sf 100.00% Impervious Runoff Depth>8.38" Tc=6.0 min CN=98 Runoff=7.60 cfs 27,943 cf
<b>Subcatchment 6DB:</b>	Runoff Area=20,940 sf 100.00% Impervious Runoff Depth>8.38" Tc=6.0 min CN=98 Runoff=3.98 cfs 14,632 cf
<b>Subcatchment 7D:</b>	Runoff Area=3,514 sf 100.00% Impervious Runoff Depth>8.38" Tc=6.0 min CN=98 Runoff=0.67 cfs 2,455 cf
<b>Subcatchment 8D:</b>	Runoff Area=12,928 sf 22.59% Impervious Runoff Depth>3.69" Tc=6.0 min CN=59 Runoff=1.25 cfs 3,976 cf
<b>Subcatchment 9D:</b>	Runoff Area=23,240 sf 79.33% Impervious Runoff Depth>7.30" Flow Length=262' Tc=7.4 min CN=89 Runoff=4.03 cfs 14,136 cf
<b>Subcatchment 10D:</b>	Runoff Area=7,314 sf 79.04% Impervious Runoff Depth>7.42" Tc=6.0 min CN=90 Runoff=1.33 cfs 4,523 cf
<b>Subcatchment 11D:</b>	Runoff Area=17,577 sf 77.58% Impervious Runoff Depth>7.17" Flow Length=388' Tc=13.1 min CN=88 Runoff=2.55 cfs 10,505 cf
<b>Subcatchment 12D:</b>	Runoff Area=21,194 sf 38.33% Impervious Runoff Depth>5.23" Flow Length=235' Tc=19.6 min CN=72 Runoff=2.03 cfs 9,242 cf
<b>Subcatchment 13D:</b>	Runoff Area=8,350 sf 47.44% Impervious Runoff Depth>6.56" Flow Length=180' Slope=0.0200 '/' Tc=22.3 min CN=83 Runoff=0.93 cfs 4,563 cf
<b>Subcatchment 14D:</b>	Runoff Area=28,275 sf 40.11% Impervious Runoff Depth>6.78" Flow Length=263' Tc=41.9 min CN=85 Runoff=2.42 cfs 15,966 cf

<b>Subcatchment 15D:</b>	Runoff Area=1,002 sf 100.00% Impervious Runoff Depth>8.38" Tc=6.0 min CN=98 Runoff=0.19 cfs 700 cf
<b>Subcatchment 16D:</b>	Runoff Area=4,641 sf 100.00% Impervious Runoff Depth>8.38" Tc=6.0 min CN=98 Runoff=0.88 cfs 3,243 cf
<b>Subcatchment 17D:</b>	Runoff Area=9,437 sf 0.00% Impervious Runoff Depth>4.05" Tc=6.0 min CN=62 Runoff=1.00 cfs 3,183 cf
<b>Subcatchment 18D:</b>	Runoff Area=698 sf 100.00% Impervious Runoff Depth>8.39" Tc=0.0 min CN=98 Runoff=0.16 cfs 488 cf
<b>Subcatchment 19D:</b>	Runoff Area=547 sf 100.00% Impervious Runoff Depth>8.38" Tc=6.0 min CN=98 Runoff=0.10 cfs 382 cf
<b>Subcatchment 20D:</b>	Runoff Area=821 sf 100.00% Impervious Runoff Depth>8.39" Tc=0.0 min CN=98 Runoff=0.18 cfs 574 cf
<b>Subcatchment 21D:</b>	Runoff Area=23,183 sf 95.63% Impervious Runoff Depth>8.14" Tc=6.0 min CN=96 Runoff=4.38 cfs 15,734 cf
<b>Subcatchment 22D:</b>	Runoff Area=3,502 sf 100.00% Impervious Runoff Depth>8.38" Tc=6.0 min CN=98 Runoff=0.67 cfs 2,447 cf
<b>Subcatchment 23D:</b>	Runoff Area=14,243 sf 69.57% Impervious Runoff Depth>7.06" Tc=6.0 min CN=87 Runoff=2.51 cfs 8,379 cf
<b>Subcatchment 24D:</b>	Runoff Area=18,756 sf 0.00% Impervious Runoff Depth>5.13" Tc=6.0 min CN=71 Runoff=2.53 cfs 8,013 cf
<b>Subcatchment 25D:</b>	Runoff Area=61,354 sf 1.97% Impervious Runoff Depth>4.17" Tc=0.0 min CN=63 Runoff=7.89 cfs 21,322 cf
<b>Pond 1W: W1</b>	Peak Elev=30.79' Storage=3,048 cf Inflow=6.51 cfs 22,644 cf Primary=2.63 cfs 22,644 cf Secondary=0.00 cfs 0 cf Outflow=2.63 cfs 22,644 cf
<b>Pond 4P: Wetland outlet behind buidling</b>	Peak Elev=41.21' Inflow=8.96 cfs 34,292 cf 15.0" Round Culvert n=0.025 L=136.0' S=0.0235 '/' Outflow=8.96 cfs 34,292 cf
<b>Pond CB1:</b>	Peak Elev=39.78' Inflow=1.25 cfs 3,976 cf 15.0" Round Culvert n=0.013 L=22.0' S=0.0100 '/' Outflow=1.25 cfs 3,976 cf
<b>Pond CB10:</b>	Peak Elev=33.60' Inflow=1.33 cfs 4,523 cf 15.0" Round Culvert n=0.013 L=95.0' S=0.0100 '/' Outflow=1.33 cfs 4,523 cf
<b>Pond CB11:</b>	Peak Elev=33.57' Inflow=14.00 cfs 59,995 cf 24.0" Round Culvert n=0.013 L=83.0' S=0.0100 '/' Outflow=14.00 cfs 59,995 cf
<b>Pond CB13:</b>	Peak Elev=32.00' Inflow=17.18 cfs 72,897 cf 24.0" Round Culvert n=0.013 L=170.0' S=0.0100 '/' Outflow=17.18 cfs 72,897 cf
<b>Pond CB14:</b>	Peak Elev=31.42' Inflow=18.17 cfs 76,140 cf 24.0" Round Culvert n=0.013 L=53.0' S=0.0019 '/' Outflow=18.17 cfs 76,140 cf

<b>Pond CB15:</b>	Peak Elev=31.07' Inflow=12.82 cfs 47,186 cf 24.0" Round Culvert n=0.013 L=14.0' S=0.0000 '/' Outflow=12.82 cfs 47,186 cf
<b>Pond CB16:</b>	Peak Elev=33.63' Inflow=12.82 cfs 47,186 cf 15.0" Round Culvert n=0.013 L=33.0' S=0.0415 '/' Outflow=12.82 cfs 47,186 cf
<b>Pond CB17:</b>	Peak Elev=33.55' Inflow=0.34 cfs 1,062 cf 15.0" Round Culvert n=0.013 L=77.0' S=0.0187 '/' Outflow=0.34 cfs 1,062 cf
<b>Pond CB18:</b>	Peak Elev=33.63' Inflow=0.18 cfs 574 cf 15.0" Round Culvert n=0.013 L=22.0' S=0.0100 '/' Outflow=0.18 cfs 574 cf
<b>Pond CB2:</b>	Peak Elev=39.58' Inflow=1.91 cfs 6,431 cf 15.0" Round Culvert n=0.013 L=133.0' S=0.0344 '/' Outflow=1.91 cfs 6,431 cf
<b>Pond CB20:</b>	Peak Elev=28.99' Inflow=0.93 cfs 4,563 cf 15.0" Round Culvert n=0.013 L=99.0' S=0.0299 '/' Outflow=0.93 cfs 4,563 cf
<b>Pond CB22:</b>	Peak Elev=30.61' Inflow=2.42 cfs 15,966 cf 15.0" Round Culvert n=0.013 L=24.0' S=0.0100 '/' Outflow=2.42 cfs 15,966 cf
<b>Pond CB3:</b>	Peak Elev=39.87' Inflow=1.09 cfs 4,334 cf 15.0" Round Culvert n=0.013 L=106.0' S=0.0100 '/' Outflow=1.09 cfs 4,334 cf
<b>Pond CB4:</b>	Peak Elev=39.64' Inflow=2.12 cfs 8,503 cf 15.0" Round Culvert n=0.013 L=41.4' S=0.0101 '/' Outflow=2.12 cfs 8,503 cf
<b>Pond CB5:</b>	Peak Elev=39.77' Inflow=8.14 cfs 35,353 cf 18.0" Round Culvert n=0.013 L=32.0' S=0.0100 '/' Outflow=8.14 cfs 35,353 cf
<b>Pond CB6:</b>	Peak Elev=38.89' Inflow=8.14 cfs 35,353 cf 18.0" Round Culvert n=0.013 L=35.0' S=0.0100 '/' Outflow=8.14 cfs 35,353 cf
<b>Pond CB7:</b>	Peak Elev=38.30' Inflow=11.50 cfs 49,489 cf 18.0" Round Culvert n=0.013 L=32.0' S=0.0100 '/' Outflow=11.50 cfs 49,489 cf
<b>Pond CB8:</b>	Peak Elev=36.79' Inflow=11.50 cfs 49,489 cf 18.0" Round Culvert n=0.013 L=92.0' S=0.0100 '/' Outflow=11.50 cfs 49,489 cf
<b>Pond CB9:</b>	Peak Elev=35.38' Inflow=11.50 cfs 49,489 cf 18.0" Round Culvert n=0.013 L=26.0' S=0.0100 '/' Outflow=11.50 cfs 49,489 cf
<b>Pond CBTD:</b>	Peak Elev=36.03' Inflow=8.26 cfs 30,390 cf 15.0" Round Culvert n=0.013 L=89.0' S=0.0222 '/' Outflow=8.26 cfs 30,390 cf
<b>Pond DMH12:</b>	Peak Elev=33.10' Inflow=15.05 cfs 64,518 cf 24.0" Round Culvert n=0.013 L=92.0' S=0.0100 '/' Outflow=15.05 cfs 64,518 cf
<b>Pond DMH21:</b>	Peak Elev=25.97' Inflow=0.93 cfs 4,563 cf 15.0" Round Culvert n=0.013 L=35.0' S=0.0100 '/' Outflow=0.93 cfs 4,563 cf

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Type III 24-hr 50yr24hr Rainfall=8.63"

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**Pond DMH23:** Peak Elev=25.54' Inflow=0.93 cfs 4,563 cf  
18.0" Round Culvert n=0.013 L=39.0' S=0.0100 '/' Outflow=0.93 cfs 4,563 cf

**Pond DMH24:** Peak Elev=25.29' Inflow=3.06 cfs 20,529 cf  
24.0" Round Culvert n=0.013 L=111.0' S=0.0100 '/' Outflow=3.06 cfs 20,529 cf

**Pond DMH25:** Peak Elev=24.20' Inflow=3.06 cfs 20,529 cf  
36.0" Round Culvert n=0.013 L=128.0' S=0.0100 '/' Outflow=3.06 cfs 20,529 cf

**Pond DMH26:** Peak Elev=23.79' Inflow=15.14 cfs 100,603 cf  
36.0" Round Culvert n=0.013 L=104.0' S=0.0092 '/' Outflow=15.14 cfs 100,603 cf

**Pond DMH27:** Peak Elev=22.96' Inflow=17.74 cfs 123,246 cf  
36.0" Round Culvert n=0.013 L=26.0' S=0.0100 '/' Outflow=17.74 cfs 123,246 cf

**Pond DMH28:** Peak Elev=22.37' Inflow=17.74 cfs 123,246 cf  
36.0" Round Culvert n=0.013 L=75.0' S=0.0113 '/' Outflow=17.74 cfs 123,246 cf

**Pond DMH29:** Peak Elev=21.35' Inflow=17.74 cfs 123,246 cf  
36.0" Round Culvert n=0.013 L=75.0' S=0.0211 '/' Outflow=17.74 cfs 123,246 cf

**Pond ST1:** Peak Elev=31.02' Storage=59,836 cf Inflow=30.55 cfs 123,326 cf  
Primary=0.16 cfs 8,043 cf Secondary=11.93 cfs 72,031 cf Outflow=12.09 cfs 80,074 cf

**Link L-D: HANNAFORD WETLAND** Inflow=23.66 cfs 183,125 cf  
Primary=23.66 cfs 183,125 cf

**Link L-E: WETLAND POCKET** Inflow=2.03 cfs 9,242 cf  
Primary=2.03 cfs 9,242 cf

**Link L-F: RTE 88 ROW** Inflow=0.54 cfs 2,477 cf  
Primary=0.54 cfs 2,477 cf

**Total Runoff Area = 454,555 sf Runoff Volume = 238,096 cf Average Runoff Depth = 6.29"**  
**47.88% Pervious = 217,663 sf 52.12% Impervious = 236,892 sf**



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**Rainfall Events Listing (selected events)**

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10yr24hr	Type III 24-hr		Default	24.00	1	5.65	2

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Type III 24-hr 10yr24hr Rainfall=5.65"

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**Summary for Subcatchment 1D:**

Runoff = 0.20 cfs @ 12.30 hrs, Volume= 1,014 cf, Depth> 1.31"  
 Routed to Link L-F : RTE 88 ROW

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
9,261	55	Woods, Good, HSG B
9,261		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	100	0.0300	0.09		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.22"
0.4	38	0.1000	1.58		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
18.6	138	Total			

**Summary for Subcatchment 2D:**

Runoff = 0.74 cfs @ 12.18 hrs, Volume= 2,898 cf, Depth> 2.35"  
 Routed to Pond 4P : Wetland outlet behind buidling

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
3,114	96	Gravel surface, HSG B
1,411	55	Woods, Good, HSG B
763	74	>75% Grass cover, Good, HSG C
9,517	61	>75% Grass cover, Good, HSG B
14,805	68	Weighted Average
14,805		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	65	0.0460	0.10		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.22"
0.2	50	0.5000	4.95		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.1	20	0.0200	2.28		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
1.0	127	0.0120	2.09	2.61	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=0.50' Z= 3.0 '/' Top.W=4.00' n= 0.035 Earth, dense weeds
12.2	262	Total			

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Type III 24-hr 10yr24hr Rainfall=5.65"

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**Summary for Subcatchment 3D:**

Runoff = 0.54 cfs @ 12.20 hrs, Volume= 2,188 cf, Depth> 2.52"  
 Routed to Pond CB3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
2,523	55	Woods, Good, HSG B
4,870	61	>75% Grass cover, Good, HSG B
55	96	Gravel surface, HSG B
2,909	98	Paved parking, HSG B
49	98	Paved parking, HSG C
10,406	70	Weighted Average
7,448		71.57% Pervious Area
2,958		28.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6	74	0.0340	0.09		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.22"
0.2	64	0.4000	4.43		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.1	42	0.0600	4.97		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
13.9	180	Total			

**Summary for Subcatchment 4D:**

Runoff = 0.52 cfs @ 12.20 hrs, Volume= 2,104 cf, Depth> 2.52"  
 Routed to Pond CB4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
2,569	55	Woods, Good, HSG B
4,474	61	>75% Grass cover, Good, HSG B
2,520	98	Paved parking, HSG B
446	98	Paved parking, HSG C
10,009	70	Weighted Average
7,043		70.37% Pervious Area
2,966		29.63% Impervious Area

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Type III 24-hr 10yr24hr Rainfall=5.65"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	79	0.0380	0.10		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.22"
0.2	61	0.4000	4.43		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.2	60	0.0500	4.54		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
14.1	200	Total			

**Summary for Subcatchment 5D:**

Runoff = 2.47 cfs @ 12.22 hrs, Volume= 10,420 cf, Depth> 2.61"  
Routed to Pond CB5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
17,420	55	Woods, Good, HSG B
11,218	61	>75% Grass cover, Good, HSG B
15,038	98	Paved parking, HSG B
63	55	Woods, Good, HSG B
701	61	>75% Grass cover, Good, HSG B
1,500	98	Paved parking, HSG C
1,338	30	Woods, Good, HSG A
615	98	Paved parking, HSG A
47,893	71	Weighted Average
30,740		64.18% Pervious Area
17,153		35.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0450	0.11		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.22"
0.2	56	0.4000	4.43		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.2	60	0.0500	4.54		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
15.9	216	Total			

**Summary for Subcatchment 6D:**

Runoff = 5.05 cfs @ 12.09 hrs, Volume= 18,334 cf, Depth> 5.41"  
Routed to Pond 4P : Wetland outlet behind buidling

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10yr24hr Rainfall=5.65"

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Type III 24-hr 10yr24hr Rainfall=5.65"

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Area (sf)	CN	Description
29,692	98	Unconnected roofs, HSG B
10,982	98	Unconnected roofs, HSG B
40,674	98	Weighted Average
40,674		100.00% Impervious Area
40,674		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					<b>Direct Entry, roof</b>

**Summary for Subcatchment 6D-2: proposed building**

Runoff = 4.96 cfs @ 12.09 hrs, Volume= 18,026 cf, Depth> 5.41"  
 Routed to Pond CBTD :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
3,441	98	Unconnected roofs, HSG B
36,550	98	Unconnected roofs, HSG B
39,991	98	Weighted Average
39,991		100.00% Impervious Area
39,991		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					<b>Direct Entry, roof</b>

**Summary for Subcatchment 6DB:**

Runoff = 2.60 cfs @ 12.09 hrs, Volume= 9,439 cf, Depth> 5.41"  
 Routed to Pond 1W : W1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
15,286	98	Unconnected roofs, HSG B
5,654	98	Unconnected roofs, HSG B
20,940	98	Weighted Average
20,940		100.00% Impervious Area
20,940		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					<b>Direct Entry, roof</b>

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Type III 24-hr 10yr24hr Rainfall=5.65"

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**Summary for Subcatchment 7D:**

Runoff = 0.44 cfs @ 12.09 hrs, Volume= 1,584 cf, Depth> 5.41"  
 Routed to Pond CB2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
1,005	98	Paved parking, HSG A
2,509	98	Paved parking, HSG B
3,514	98	Weighted Average
3,514		100.00% Impervious Area

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

**Summary for Subcatchment 8D:**

Runoff = 0.51 cfs @ 12.10 hrs, Volume= 1,742 cf, Depth> 1.62"  
 Routed to Pond CB1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
2,518	98	Paved parking, HSG B
5,367	61	>75% Grass cover, Good, HSG B
3,588	30	Woods, Good, HSG A
402	98	Paved parking, HSG A
1,053	39	>75% Grass cover, Good, HSG A
12,928	59	Weighted Average
10,008		77.41% Pervious Area
2,920		22.59% Impervious Area

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

**Summary for Subcatchment 9D:**

Runoff = 2.50 cfs @ 12.10 hrs, Volume= 8,507 cf, Depth> 4.39"  
 Routed to Pond CB7 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

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Type III 24-hr 10yr24hr Rainfall=5.65"

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Area (sf)	CN	Description
579	30	Woods, Good, HSG A
3,373	61	>75% Grass cover, Good, HSG B
417	98	Unconnected pavement, HSG A
9,235	98	Paved parking, HSG B
600	39	>75% Grass cover, Good, HSG A
8,784	98	Paved parking, HSG A
252	74	>75% Grass cover, Good, HSG C
23,240	89	Weighted Average
4,804		20.67% Pervious Area
18,436		79.33% Impervious Area
417		2.26% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	46	0.0900	0.12		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.22"
0.1	25	0.5000	4.95		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
1.0	191	0.0240	3.14		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
7.4	262	Total			

**Summary for Subcatchment 10D:**

Runoff = 0.83 cfs @ 12.09 hrs, Volume= 2,744 cf, Depth> 4.50"  
 Routed to Pond CB10 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
1,533	61	>75% Grass cover, Good, HSG B
1,522	98	Unconnected pavement, HSG B
4,259	98	Paved parking, HSG B
7,314	90	Weighted Average
1,533		20.96% Pervious Area
5,781		79.04% Impervious Area
1,522		26.33% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					<b>Direct Entry,</b>

**Summary for Subcatchment 11D:**

Runoff = 1.56 cfs @ 12.18 hrs, Volume= 6,271 cf, Depth> 4.28"  
 Routed to Pond CB11 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

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Type III 24-hr 10yr24hr Rainfall=5.65"

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Area (sf)	CN	Description
7,216	98	Paved parking, HSG A
6,131	98	Paved parking, HSG B
2,638	61	>75% Grass cover, Good, HSG B
205	98	Unconnected pavement, HSG A
269	30	Woods, Good, HSG A
84	98	Paved parking, HSG C
1,034	39	>75% Grass cover, Good, HSG A
17,577	88	Weighted Average
3,941		22.42% Pervious Area
13,636		77.58% Impervious Area
205		1.50% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	64	0.0400	0.09		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.22"
0.1	35	0.4500	4.70		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
1.6	289	0.0210	2.94		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
13.1	388	Total			

**Summary for Subcatchment 12D:**

Runoff = 1.04 cfs @ 12.28 hrs, Volume= 4,766 cf, Depth> 2.70"  
 Routed to Link L-E : WETLAND POCKET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
8,124	98	Paved parking, HSG D
3,633	80	>75% Grass cover, Good, HSG D
5,767	39	>75% Grass cover, Good, HSG A
1,000	30	Woods, Good, HSG A
261	55	Woods, Good, HSG B
1,493	74	>75% Grass cover, Good, HSG C
916	61	>75% Grass cover, Good, HSG B
21,194	72	Weighted Average
13,070		61.67% Pervious Area
8,124		38.33% Impervious Area



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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	95	0.0100	0.09		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.22"
0.3	60	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
1.3	80	0.0200	0.99		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
19.6	235	Total			

**Summary for Subcatchment 13D:**

Runoff = 0.54 cfs @ 12.30 hrs, Volume= 2,612 cf, Depth> 3.75"  
Routed to Pond CB20 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
617	61	>75% Grass cover, Good, HSG B
2,972	80	>75% Grass cover, Good, HSG D
3,835	98	Paved parking, HSG D
126	98	Paved parking, HSG B
800	39	>75% Grass cover, Good, HSG A
8,350	83	Weighted Average
4,389		52.56% Pervious Area
3,961		47.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.8	100	0.0200	0.08		<b>Sheet Flow,</b> Grass: Bermuda n= 0.410 P2= 3.22"
0.5	80	0.0200	2.87		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
22.3	180	Total			

**Summary for Subcatchment 14D:**

Runoff = 1.44 cfs @ 12.56 hrs, Volume= 9,293 cf, Depth> 3.94"  
Routed to Pond CB22 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10yr24hr Rainfall=5.65"

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Type III 24-hr 10yr24hr Rainfall=5.65"

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Area (sf)	CN	Description
13,383	80	>75% Grass cover, Good, HSG D
10,796	98	Paved parking, HSG D
545	98	Roofs, HSG D
3,551	61	>75% Grass cover, Good, HSG B
28,275	85	Weighted Average
16,934		59.89% Pervious Area
11,341		40.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.0	100	0.0050	0.04		<b>Sheet Flow,</b> Grass: Bermuda n= 0.410 P2= 3.22"
3.9	163	0.0100	0.70		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
41.9	263	Total			

**Summary for Subcatchment 15D:**

Runoff = 0.12 cfs @ 12.09 hrs, Volume= 452 cf, Depth> 5.41"  
Routed to Link L-D : HANNAFORD WETLAND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
1,002	98	Paved parking, HSG B
1,002		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					<b>Direct Entry,</b>

**Summary for Subcatchment 16D:**

Runoff = 0.58 cfs @ 12.09 hrs, Volume= 2,092 cf, Depth> 5.41"  
Routed to Pond CB14 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
4,641	98	Paved parking, HSG B
4,641		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					<b>Direct Entry,</b>

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Type III 24-hr 10yr24hr Rainfall=5.65"

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**Summary for Subcatchment 17D:**

Runoff = 0.44 cfs @ 12.10 hrs, Volume= 1,457 cf, Depth> 1.85"  
 Routed to Link L-D : HANNAFORD WETLAND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
8,997	61	>75% Grass cover, Good, HSG B
440	74	>75% Grass cover, Good, HSG C
9,437	62	Weighted Average
9,437		100.00% Pervious Area

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

**Summary for Subcatchment 18D:**

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.10 cfs @ 12.00 hrs, Volume= 315 cf, Depth> 5.41"  
 Routed to Pond CB17 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
698	98	Paved parking, HSG B
698		100.00% Impervious Area

**Summary for Subcatchment 19D:**

Runoff = 0.07 cfs @ 12.09 hrs, Volume= 247 cf, Depth> 5.41"  
 Routed to Link L-D : HANNAFORD WETLAND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
164	98	Paved parking, HSG B
383	98	Paved parking, HSG C
547	98	Weighted Average
547		100.00% Impervious Area

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Type III 24-hr 10yr24hr Rainfall=5.65"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					<b>Direct Entry,</b>

**Summary for Subcatchment 20D:**

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.12 cfs @ 12.00 hrs, Volume= 370 cf, Depth> 5.41"  
 Routed to Pond CB18 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
821	98	Paved parking, HSG B
821		100.00% Impervious Area

**Summary for Subcatchment 21D:**

Runoff = 2.84 cfs @ 12.09 hrs, Volume= 9,999 cf, Depth> 5.18"  
 Routed to Pond CB16 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
15,413	98	Paved parking, HSG B
1,014	61	>75% Grass cover, Good, HSG B
6,756	98	Paved parking, HSG A
23,183	96	Weighted Average
1,014		4.37% Pervious Area
22,169		95.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					<b>Direct Entry,</b>

**Summary for Subcatchment 22D:**

Runoff = 0.43 cfs @ 12.09 hrs, Volume= 1,579 cf, Depth> 5.41"  
 Routed to Pond CBTD :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

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Type III 24-hr 10yr24hr Rainfall=5.65"

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Area (sf)	CN	Description
3,439	98	Paved parking, HSG A
63	98	Paved parking, HSG B
3,502	98	Weighted Average
3,502		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					<b>Direct Entry,</b>

**Summary for Subcatchment 23D:**

Runoff = 1.53 cfs @ 12.09 hrs, Volume= 4,961 cf, Depth> 4.18"  
 Routed to Pond CB13 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
4,334	61	>75% Grass cover, Good, HSG B
1,407	98	Unconnected pavement, HSG B
8,502	98	Paved parking, HSG B
14,243	87	Weighted Average
4,334		30.43% Pervious Area
9,909		69.57% Impervious Area
1,407		14.20% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					<b>Direct Entry,</b>

**Summary for Subcatchment 24D:**

Runoff = 1.29 cfs @ 12.10 hrs, Volume= 4,090 cf, Depth> 2.62"  
 Routed to Pond 1W : W1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
11,128	80	>75% Grass cover, Good, HSG D
1,042	96	Gravel surface, HSG A
466	74	>75% Grass cover, Good, HSG C
2,685	61	>75% Grass cover, Good, HSG B
3,435	39	>75% Grass cover, Good, HSG A
18,756	71	Weighted Average
18,756		100.00% Pervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					<b>Direct Entry,</b>

**Summary for Subcatchment 25D:**

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 3.52 cfs @ 12.01 hrs, Volume= 9,896 cf, Depth> 1.94"  
 Routed to Link L-D : HANNAFORD WETLAND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 10yr24hr Rainfall=5.65"

Area (sf)	CN	Description
23,738	55	Woods, Good, HSG B
15,403	61	>75% Grass cover, Good, HSG B
6,949	96	Gravel surface, HSG B
1,208	98	Unconnected pavement, HSG B
8,759	70	Woods, Good, HSG C
780	96	Gravel surface, HSG A
4,517	39	>75% Grass cover, Good, HSG A
61,354	63	Weighted Average
60,146		98.03% Pervious Area
1,208		1.97% Impervious Area
1,208		100.00% Unconnected

**Summary for Pond 1W: W1**

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=34)

Inflow Area = 39,696 sf, 52.75% Impervious, Inflow Depth > 4.09" for 10yr24hr event  
 Inflow = 3.88 cfs @ 12.09 hrs, Volume= 13,529 cf  
 Outflow = 2.17 cfs @ 12.22 hrs, Volume= 13,543 cf, Atten= 44%, Lag= 7.8 min  
 Primary = 2.17 cfs @ 12.22 hrs, Volume= 13,543 cf  
 Routed to Pond DMH27 :  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
 Routed to Link L-D : HANNAFORD WETLAND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 30.01' @ 12.22 hrs Surf.Area= 1,971 sf Storage= 1,000 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)  
 Center-of-Mass det. time= 1.7 min ( 775.3 - 773.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	22,530 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
28.00	4	0	0
29.00	4	4	4
30.00	1,960	982	986
31.00	3,615	2,788	3,774
32.00	4,758	4,187	7,960
33.00	5,649	5,204	13,164
34.00	6,542	6,096	19,259
34.50	6,542	3,271	22,530

Device	Routing	Invert	Outlet Devices
#1	Primary	28.00'	<b>12.0" Round Culvert</b> L= 160.0' Ke= 0.050 Inlet / Outlet Invert= 28.00' / 26.41' S= 0.0099 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	28.00'	<b>8.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	33.00'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Secondary	34.00'	<b>88.0' long + 1.0 '/' SideZ x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

**Primary OutFlow** Max=2.17 cfs @ 12.22 hrs HW=30.00' TW=21.67' (Dynamic Tailwater)

- ↑ **1=Culvert** (Passes 2.17 cfs of 4.12 cfs potential flow)
- ↑ **2=Orifice/Grate** (Orifice Controls 2.17 cfs @ 6.22 fps)
- ↑ **3=Orifice/Grate** ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=28.00' TW=0.00' (Dynamic Tailwater)

- ↑ **4=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

**Summary for Pond 4P: Wetland outlet behind buidling**

[57] Hint: Peaked at 34.78' (Flood elevation advised)

Inflow Area = 55,479 sf, 73.31% Impervious, Inflow Depth > 4.59" for 10yr24hr event  
 Inflow = 5.62 cfs @ 12.09 hrs, Volume= 21,232 cf  
 Outflow = 5.62 cfs @ 12.09 hrs, Volume= 21,232 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 5.62 cfs @ 12.09 hrs, Volume= 21,232 cf  
 Routed to Link L-D : HANNAFORD WETLAND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 34.78' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	32.60'	<b>15.0" Round Culvert</b> L= 136.0' Ke= 0.050 Inlet / Outlet Invert= 32.60' / 29.40' S= 0.0235 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

**Primary OutFlow** Max=5.51 cfs @ 12.09 hrs HW=34.65' TW=0.00' (Dynamic Tailwater)

- ↑ **1=Culvert** (Barrel Controls 5.51 cfs @ 4.49 fps)

**Summary for Pond CB1:**

[57] Hint: Peaked at 38.83' (Flood elevation advised)

Inflow Area = 12,928 sf, 22.59% Impervious, Inflow Depth > 1.62" for 10yr24hr event  
 Inflow = 0.51 cfs @ 12.10 hrs, Volume= 1,742 cf  
 Outflow = 0.51 cfs @ 12.10 hrs, Volume= 1,742 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.51 cfs @ 12.10 hrs, Volume= 1,742 cf  
 Routed to Pond CB2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 38.83' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	38.45'	<b>15.0" Round Culvert</b> L= 22.0' Ke= 0.500 Inlet / Outlet Invert= 38.45' / 38.23' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf

**Primary OutFlow** Max=0.51 cfs @ 12.10 hrs HW=38.83' TW=38.59' (Dynamic Tailwater)  
 ↑**1=Culvert** (Outlet Controls 0.51 cfs @ 2.42 fps)

**Summary for Pond CB10:**

[57] Hint: Peaked at 33.48' (Flood elevation advised)

Inflow Area = 7,314 sf, 79.04% Impervious, Inflow Depth > 4.50" for 10yr24hr event  
 Inflow = 0.83 cfs @ 12.09 hrs, Volume= 2,744 cf  
 Outflow = 0.83 cfs @ 12.09 hrs, Volume= 2,744 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.83 cfs @ 12.09 hrs, Volume= 2,744 cf  
 Routed to Pond DMH12 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 33.48' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	33.05'	<b>15.0" Round Culvert</b> L= 95.0' Ke= 0.500 Inlet / Outlet Invert= 33.05' / 32.10' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf

**Primary OutFlow** Max=0.81 cfs @ 12.09 hrs HW=33.47' TW=29.73' (Dynamic Tailwater)  
 ↑**1=Culvert** (Inlet Controls 0.81 cfs @ 2.21 fps)

**Summary for Pond CB11:**

[57] Hint: Peaked at 30.68' (Flood elevation advised)

Inflow Area = 125,567 sf, 49.04% Impervious, Inflow Depth > 3.14" for 10yr24hr event  
 Inflow = 7.67 cfs @ 12.15 hrs, Volume= 32,817 cf  
 Outflow = 7.67 cfs @ 12.15 hrs, Volume= 32,817 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 7.67 cfs @ 12.15 hrs, Volume= 32,817 cf  
 Routed to Pond DMH12 :



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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 30.68' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	29.30'	<b>24.0" Round Culvert</b> L= 83.0' Ke= 0.500 Inlet / Outlet Invert= 29.30' / 28.47' S= 0.0100 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

**Primary OutFlow** Max=7.65 cfs @ 12.15 hrs HW=30.67' TW=29.82' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 7.65 cfs @ 4.69 fps)**Summary for Pond CB13:**

[57] Hint: Peaked at 28.94' (Flood elevation advised)

Inflow Area = 147,124 sf, 52.52% Impervious, Inflow Depth > 3.31" for 10yr24hr event  
 Inflow = 9.75 cfs @ 12.12 hrs, Volume= 40,522 cf  
 Outflow = 9.75 cfs @ 12.12 hrs, Volume= 40,522 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 9.75 cfs @ 12.12 hrs, Volume= 40,522 cf  
 Routed to Pond CB14 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 28.94' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	27.35'	<b>24.0" Round Culvert</b> L= 170.0' Ke= 0.500 Inlet / Outlet Invert= 27.35' / 25.65' S= 0.0100 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

**Primary OutFlow** Max=9.54 cfs @ 12.12 hrs HW=28.92' TW=27.63' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 9.54 cfs @ 4.97 fps)**Summary for Pond CB14:**

[57] Hint: Peaked at 28.88' (Flood elevation advised)

Inflow Area = 151,765 sf, 53.97% Impervious, Inflow Depth > 3.37" for 10yr24hr event  
 Inflow = 10.28 cfs @ 12.12 hrs, Volume= 42,614 cf  
 Outflow = 10.28 cfs @ 12.12 hrs, Volume= 42,614 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 10.28 cfs @ 12.12 hrs, Volume= 42,614 cf  
 Routed to Pond ST1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 28.88' @ 13.24 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	25.75'	<b>24.0" Round Culvert</b> L= 53.0' Ke= 0.500 Inlet / Outlet Invert= 25.75' / 25.65' S= 0.0019 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

**Primary OutFlow** Max=10.06 cfs @ 12.12 hrs HW=27.63' TW=26.87' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 10.06 cfs @ 4.25 fps)

**Summary for Pond CB15:**

[57] Hint: Peaked at 28.88' (Flood elevation advised)

Inflow Area = 68,195 sf, 98.51% Impervious, Inflow Depth > 5.33" for 10yr24hr event  
 Inflow = 8.35 cfs @ 12.09 hrs, Volume= 30,289 cf  
 Outflow = 8.35 cfs @ 12.09 hrs, Volume= 30,289 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 8.35 cfs @ 12.09 hrs, Volume= 30,289 cf  
 Routed to Pond ST1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 28.88' @ 13.26 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	25.65'	<b>24.0" Round Culvert</b> L= 14.0' Ke= 0.500 Inlet / Outlet Invert= 25.65' / 25.65' S= 0.0000 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

**Primary OutFlow** Max=8.12 cfs @ 12.09 hrs HW=27.29' TW=26.64' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 8.12 cfs @ 4.00 fps)

**Summary for Pond CB16:**

[57] Hint: Peaked at 30.31' (Flood elevation advised)

Inflow Area = 68,195 sf, 98.51% Impervious, Inflow Depth > 5.33" for 10yr24hr event  
 Inflow = 8.35 cfs @ 12.09 hrs, Volume= 30,289 cf  
 Outflow = 8.35 cfs @ 12.09 hrs, Volume= 30,289 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 8.35 cfs @ 12.09 hrs, Volume= 30,289 cf  
 Routed to Pond CB15 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 30.31' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	27.70'	<b>15.0" Round Culvert</b> L= 33.0' Ke= 0.500 Inlet / Outlet Invert= 27.70' / 26.33' S= 0.0415 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf

**Primary OutFlow** Max=8.12 cfs @ 12.09 hrs HW=30.21' TW=27.29' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 8.12 cfs @ 6.62 fps)

**Summary for Pond CB17:**

[57] Hint: Peaked at 30.29' (Flood elevation advised)

[80] Warning: Exceeded Pond CB18 by 0.05' @ 12.10 hrs (0.06 cfs 11 cf)

Inflow Area = 1,519 sf, 100.00% Impervious, Inflow Depth > 5.41" for 10yr24hr event  
 Inflow = 0.22 cfs @ 12.00 hrs, Volume= 685 cf  
 Outflow = 0.22 cfs @ 12.00 hrs, Volume= 685 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.22 cfs @ 12.00 hrs, Volume= 685 cf  
 Routed to Pond CB16 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 30.29' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	29.78'	<b>15.0" Round Culvert</b> L= 77.0' Ke= 0.500 Inlet / Outlet Invert= 29.78' / 28.34' S= 0.0187 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf

**Primary OutFlow** Max=0.22 cfs @ 12.00 hrs HW=30.00' TW=29.22' (Dynamic Tailwater)  
 ←1=Culvert (Outlet Controls 0.22 cfs @ 2.32 fps)

**Summary for Pond CB18:**

[57] Hint: Peaked at 30.30' (Flood elevation advised)

Inflow Area = 821 sf, 100.00% Impervious, Inflow Depth > 5.41" for 10yr24hr event  
 Inflow = 0.12 cfs @ 12.00 hrs, Volume= 370 cf  
 Outflow = 0.12 cfs @ 12.00 hrs, Volume= 370 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.12 cfs @ 12.00 hrs, Volume= 370 cf  
 Routed to Pond CB17 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 30.30' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	30.10'	<b>15.0" Round Culvert</b> L= 22.0' Ke= 0.500 Inlet / Outlet Invert= 30.10' / 29.88' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf

**Primary OutFlow** Max=0.12 cfs @ 12.00 hrs HW=30.27' TW=30.00' (Dynamic Tailwater)  
 ←1=Culvert (Barrel Controls 0.12 cfs @ 1.89 fps)

**Summary for Pond CB2:**

[57] Hint: Peaked at 38.59' (Flood elevation advised)

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Inflow Area = 16,442 sf, 39.13% Impervious, Inflow Depth > 2.43" for 10yr24hr event  
 Inflow = 0.94 cfs @ 12.10 hrs, Volume= 3,326 cf  
 Outflow = 0.94 cfs @ 12.10 hrs, Volume= 3,326 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.94 cfs @ 12.10 hrs, Volume= 3,326 cf  
 Routed to Pond CB5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 38.59' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	38.13'	<b>15.0" Round Culvert</b> L= 133.0' Ke= 0.500 Inlet / Outlet Invert= 38.13' / 33.55' S= 0.0344 1' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf

**Primary OutFlow** Max=0.93 cfs @ 12.10 hrs HW=38.59' TW=33.04' (Dynamic Tailwater)  
 ↑1=Culvert (Inlet Controls 0.93 cfs @ 2.30 fps)

**Summary for Pond CB20:**

[57] Hint: Peaked at 28.88' (Flood elevation advised)

Inflow Area = 8,350 sf, 47.44% Impervious, Inflow Depth > 3.75" for 10yr24hr event  
 Inflow = 0.54 cfs @ 12.30 hrs, Volume= 2,612 cf  
 Outflow = 0.54 cfs @ 12.30 hrs, Volume= 2,612 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.54 cfs @ 12.30 hrs, Volume= 2,612 cf  
 Routed to Pond DMH21 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 28.88' @ 12.30 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	28.54'	<b>15.0" Round Culvert</b> L= 99.0' Ke= 0.500 Inlet / Outlet Invert= 28.54' / 25.58' S= 0.0299 1' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf

**Primary OutFlow** Max=0.54 cfs @ 12.30 hrs HW=28.88' TW=25.83' (Dynamic Tailwater)  
 ↑1=Culvert (Inlet Controls 0.54 cfs @ 1.99 fps)

**Summary for Pond CB22:**

[57] Hint: Peaked at 30.38' (Flood elevation advised)

Inflow Area = 28,275 sf, 40.11% Impervious, Inflow Depth > 3.94" for 10yr24hr event  
 Inflow = 1.44 cfs @ 12.56 hrs, Volume= 9,293 cf  
 Outflow = 1.44 cfs @ 12.56 hrs, Volume= 9,293 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 1.44 cfs @ 12.56 hrs, Volume= 9,293 cf  
 Routed to Pond DMH24 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 30.38' @ 12.56 hrs

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Device	Routing	Invert	Outlet Devices
#1	Primary	29.75'	<b>15.0" Round Culvert</b> L= 24.0' Ke= 0.500 Inlet / Outlet Invert= 29.75' / 29.51' S= 0.0100 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf

**Primary OutFlow** Max=1.43 cfs @ 12.56 hrs HW=30.38' TW=25.09' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 1.43 cfs @ 3.39 fps)**Summary for Pond CB3:**

Inflow Area = 10,406 sf, 28.43% Impervious, Inflow Depth > 2.52" for 10yr24hr event  
 Inflow = 0.54 cfs @ 12.20 hrs, Volume= 2,188 cf  
 Outflow = 0.54 cfs @ 12.20 hrs, Volume= 2,188 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.54 cfs @ 12.20 hrs, Volume= 2,188 cf  
 Routed to Pond CB4 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 34.04' @ 12.21 hrs

Flood Elev= 39.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.65'	<b>15.0" Round Culvert</b> L= 106.0' Ke= 0.500 Inlet / Outlet Invert= 33.65' / 32.59' S= 0.0100 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf

**Primary OutFlow** Max=0.53 cfs @ 12.20 hrs HW=34.03' TW=33.36' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 0.53 cfs @ 2.49 fps)**Summary for Pond CB4:**

Inflow Area = 20,415 sf, 29.02% Impervious, Inflow Depth > 2.52" for 10yr24hr event  
 Inflow = 1.06 cfs @ 12.20 hrs, Volume= 4,292 cf  
 Outflow = 1.06 cfs @ 12.20 hrs, Volume= 4,292 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 1.06 cfs @ 12.20 hrs, Volume= 4,292 cf  
 Routed to Pond CB5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 33.36' @ 12.22 hrs

Flood Elev= 39.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	32.49'	<b>15.0" Round Culvert</b> L= 41.4' Ke= 0.500 Inlet / Outlet Invert= 32.49' / 32.07' S= 0.0101 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf

**Primary OutFlow** Max=0.95 cfs @ 12.20 hrs HW=33.36' TW=33.27' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 0.95 cfs @ 1.48 fps)

**Summary for Pond CB5:**

Inflow Area = 84,750 sf, 34.82% Impervious, Inflow Depth > 2.55" for 10yr24hr event  
 Inflow = 4.09 cfs @ 12.20 hrs, Volume= 18,039 cf  
 Outflow = 4.09 cfs @ 12.20 hrs, Volume= 18,039 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 4.09 cfs @ 12.20 hrs, Volume= 18,039 cf  
 Routed to Pond CB6 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 33.28' @ 12.20 hrs  
 Flood Elev= 37.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.97'	<b>18.0" Round Culvert</b> L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 31.97' / 31.65' S= 0.0100 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

**Primary OutFlow** Max=4.18 cfs @ 12.20 hrs HW=33.27' TW=32.91' (Dynamic Tailwater)  
 ↑**1=Culvert** (Outlet Controls 4.18 cfs @ 3.42 fps)

**Summary for Pond CB6:**

[57] Hint: Peaked at 32.92' (Flood elevation advised)

Inflow Area = 84,750 sf, 34.82% Impervious, Inflow Depth > 2.55" for 10yr24hr event  
 Inflow = 4.09 cfs @ 12.20 hrs, Volume= 18,039 cf  
 Outflow = 4.09 cfs @ 12.20 hrs, Volume= 18,039 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 4.09 cfs @ 12.20 hrs, Volume= 18,039 cf  
 Routed to Pond CB7 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 32.92' @ 12.19 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	31.55'	<b>18.0" Round Culvert</b> L= 35.0' Ke= 0.500 Inlet / Outlet Invert= 31.55' / 31.20' S= 0.0100 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

**Primary OutFlow** Max=4.20 cfs @ 12.20 hrs HW=32.91' TW=32.58' (Dynamic Tailwater)  
 ↑**1=Culvert** (Outlet Controls 4.20 cfs @ 3.27 fps)

**Summary for Pond CB7:**

[57] Hint: Peaked at 32.62' (Flood elevation advised)

Inflow Area = 107,990 sf, 44.40% Impervious, Inflow Depth > 2.95" for 10yr24hr event  
 Inflow = 6.14 cfs @ 12.15 hrs, Volume= 26,546 cf  
 Outflow = 6.14 cfs @ 12.15 hrs, Volume= 26,546 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 6.14 cfs @ 12.15 hrs, Volume= 26,546 cf  
 Routed to Pond CB8 :

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 32.62' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	31.10'	<b>18.0" Round Culvert</b> L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 31.10' / 30.78' S= 0.0100 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

**Primary OutFlow** Max=5.99 cfs @ 12.15 hrs HW=32.61' TW=32.08' (Dynamic Tailwater)  
 ↑1=Culvert (Outlet Controls 5.99 cfs @ 4.18 fps)

**Summary for Pond CB8:**

[57] Hint: Peaked at 32.09' (Flood elevation advised)

Inflow Area = 107,990 sf, 44.40% Impervious, Inflow Depth > 2.95" for 10yr24hr event  
 Inflow = 6.14 cfs @ 12.15 hrs, Volume= 26,546 cf  
 Outflow = 6.14 cfs @ 12.15 hrs, Volume= 26,546 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 6.14 cfs @ 12.15 hrs, Volume= 26,546 cf  
 Routed to Pond CB9 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 32.09' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	30.68'	<b>18.0" Round Culvert</b> L= 92.0' Ke= 0.500 Inlet / Outlet Invert= 30.68' / 29.76' S= 0.0100 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

**Primary OutFlow** Max=6.01 cfs @ 12.15 hrs HW=32.08' TW=31.18' (Dynamic Tailwater)  
 ↑1=Culvert (Outlet Controls 6.01 cfs @ 4.53 fps)

**Summary for Pond CB9:**

[57] Hint: Peaked at 31.19' (Flood elevation advised)

Inflow Area = 107,990 sf, 44.40% Impervious, Inflow Depth > 2.95" for 10yr24hr event  
 Inflow = 6.14 cfs @ 12.15 hrs, Volume= 26,546 cf  
 Outflow = 6.14 cfs @ 12.15 hrs, Volume= 26,546 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 6.14 cfs @ 12.15 hrs, Volume= 26,546 cf  
 Routed to Pond CB11 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 31.19' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	29.66'	<b>18.0" Round Culvert</b> L= 26.0' Ke= 0.500 Inlet / Outlet Invert= 29.66' / 29.40' S= 0.0100 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

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**Primary OutFlow** Max=6.01 cfs @ 12.15 hrs HW=31.18' TW=30.67' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 6.01 cfs @ 4.18 fps)

**Summary for Pond CBTD:**

[57] Hint: Peaked at 32.26' (Flood elevation advised)

Inflow Area = 43,493 sf, 100.00% Impervious, Inflow Depth > 5.41" for 10yr24hr event  
 Inflow = 5.40 cfs @ 12.09 hrs, Volume= 19,604 cf  
 Outflow = 5.40 cfs @ 12.09 hrs, Volume= 19,604 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 5.40 cfs @ 12.09 hrs, Volume= 19,604 cf  
 Routed to Pond CB16 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 32.26' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	30.80'	<b>15.0" Round Culvert</b> L= 89.0' Ke= 0.500 Inlet / Outlet Invert= 30.80' / 28.82' S= 0.0222 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf

**Primary OutFlow** Max=5.25 cfs @ 12.09 hrs HW=32.21' TW=30.22' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 5.25 cfs @ 4.28 fps)

**Summary for Pond DMH12:**

[57] Hint: Peaked at 29.82' (Flood elevation advised)

Inflow Area = 132,881 sf, 50.69% Impervious, Inflow Depth > 3.21" for 10yr24hr event  
 Inflow = 8.33 cfs @ 12.14 hrs, Volume= 35,561 cf  
 Outflow = 8.33 cfs @ 12.14 hrs, Volume= 35,561 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 8.33 cfs @ 12.14 hrs, Volume= 35,561 cf  
 Routed to Pond CB13 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 29.82' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	28.37'	<b>24.0" Round Culvert</b> L= 92.0' Ke= 0.500 Inlet / Outlet Invert= 28.37' / 27.45' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

**Primary OutFlow** Max=8.27 cfs @ 12.14 hrs HW=29.82' TW=28.92' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 8.27 cfs @ 4.75 fps)



**Summary for Pond DMH21:**

[57] Hint: Peaked at 25.83' (Flood elevation advised)

Inflow Area = 8,350 sf, 47.44% Impervious, Inflow Depth > 3.75" for 10yr24hr event  
 Inflow = 0.54 cfs @ 12.30 hrs, Volume= 2,612 cf  
 Outflow = 0.54 cfs @ 12.30 hrs, Volume= 2,612 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.54 cfs @ 12.30 hrs, Volume= 2,612 cf  
 Routed to Pond DMH23 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 25.83' @ 12.30 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	25.48'	<b>15.0" Round Culvert</b> L= 35.0' Ke= 0.500 Inlet / Outlet Invert= 25.48' / 25.13' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf

**Primary OutFlow** Max=0.54 cfs @ 12.30 hrs HW=25.83' TW=25.39' (Dynamic Tailwater)  
 ↑**1=Culvert** (Barrel Controls 0.54 cfs @ 2.84 fps)

**Summary for Pond DMH23:**

[57] Hint: Peaked at 25.40' (Flood elevation advised)

Inflow Area = 8,350 sf, 47.44% Impervious, Inflow Depth > 3.75" for 10yr24hr event  
 Inflow = 0.54 cfs @ 12.30 hrs, Volume= 2,612 cf  
 Outflow = 0.54 cfs @ 12.30 hrs, Volume= 2,612 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.54 cfs @ 12.30 hrs, Volume= 2,612 cf  
 Routed to Pond DMH24 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 25.40' @ 12.33 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	25.03'	<b>18.0" Round Culvert</b> L= 39.0' Ke= 0.500 Inlet / Outlet Invert= 25.03' / 24.64' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

**Primary OutFlow** Max=0.54 cfs @ 12.30 hrs HW=25.39' TW=25.05' (Dynamic Tailwater)  
 ↑**1=Culvert** (Outlet Controls 0.54 cfs @ 2.46 fps)

**Summary for Pond DMH24:**

[57] Hint: Peaked at 25.10' (Flood elevation advised)

Inflow Area = 36,625 sf, 41.78% Impervious, Inflow Depth > 3.90" for 10yr24hr event  
 Inflow = 1.82 cfs @ 12.49 hrs, Volume= 11,904 cf  
 Outflow = 1.82 cfs @ 12.49 hrs, Volume= 11,904 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 1.82 cfs @ 12.49 hrs, Volume= 11,904 cf  
 Routed to Pond DMH25 :

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 25.10' @ 12.49 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	24.54'	<b>24.0" Round Culvert</b> L= 111.0' Ke= 0.500 Inlet / Outlet Invert= 24.54' / 23.43' S= 0.0100 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

**Primary OutFlow** Max=1.81 cfs @ 12.49 hrs HW=25.10' TW=23.82' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 1.81 cfs @ 2.54 fps)**Summary for Pond DMH25:**

[57] Hint: Peaked at 23.82' (Flood elevation advised)

Inflow Area = 36,625 sf, 41.78% Impervious, Inflow Depth > 3.90" for 10yr24hr event  
 Inflow = 1.82 cfs @ 12.49 hrs, Volume= 11,904 cf  
 Outflow = 1.82 cfs @ 12.49 hrs, Volume= 11,904 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 1.82 cfs @ 12.49 hrs, Volume= 11,904 cf  
 Routed to Pond DMH26 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 23.82' @ 12.49 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	23.33'	<b>36.0" Round Culvert</b> L= 128.0' Ke= 0.500 Inlet / Outlet Invert= 23.33' / 22.05' S= 0.0100 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf

**Primary OutFlow** Max=1.81 cfs @ 12.49 hrs HW=23.82' TW=22.51' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 1.81 cfs @ 2.39 fps)**Summary for Pond DMH26:**

[57] Hint: Peaked at 22.57' (Flood elevation advised)

[80] Warning: Exceeded Pond ST1 by 0.45' @ 0.00 hrs (0.02 cfs 460 cf)

Inflow Area = 256,585 sf, 64.07% Impervious, Inflow Depth > 1.97" for 10yr24hr event  
 Inflow = 2.65 cfs @ 12.85 hrs, Volume= 42,198 cf  
 Outflow = 2.65 cfs @ 12.85 hrs, Volume= 42,198 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 2.65 cfs @ 12.85 hrs, Volume= 42,198 cf  
 Routed to Pond DMH27 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 22.57' @ 12.80 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	21.95'	<b>36.0" Round Culvert</b> L= 104.0' Ke= 0.500 Inlet / Outlet Invert= 21.95' / 20.99' S= 0.0092 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf

**Primary OutFlow** Max=2.69 cfs @ 12.85 hrs HW=22.56' TW=21.56' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 2.69 cfs @ 3.91 fps)

**Summary for Pond DMH27:**

[57] Hint: Peaked at 21.72' (Flood elevation advised)

Inflow Area = 296,281 sf, 62.55% Impervious, Inflow Depth > 2.26" for 10yr24hr event  
 Inflow = 3.95 cfs @ 12.40 hrs, Volume= 55,742 cf  
 Outflow = 3.95 cfs @ 12.40 hrs, Volume= 55,742 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 3.95 cfs @ 12.40 hrs, Volume= 55,742 cf  
 Routed to Pond DMH28 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 21.72' @ 12.41 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	20.89'	<b>36.0" Round Culvert</b> L= 26.0' Ke= 0.500 Inlet / Outlet Invert= 20.89' / 20.63' S= 0.0100 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf

**Primary OutFlow** Max=3.95 cfs @ 12.40 hrs HW=21.72' TW=21.28' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 3.95 cfs @ 3.75 fps)

**Summary for Pond DMH28:**

[57] Hint: Peaked at 21.28' (Flood elevation advised)

Inflow Area = 296,281 sf, 62.55% Impervious, Inflow Depth > 2.26" for 10yr24hr event  
 Inflow = 3.95 cfs @ 12.40 hrs, Volume= 55,742 cf  
 Outflow = 3.95 cfs @ 12.40 hrs, Volume= 55,742 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 3.95 cfs @ 12.40 hrs, Volume= 55,742 cf  
 Routed to Pond DMH29 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 21.28' @ 12.40 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	20.53'	<b>36.0" Round Culvert</b> L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 20.53' / 19.68' S= 0.0113 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf

**Primary OutFlow** Max=3.95 cfs @ 12.40 hrs HW=21.28' TW=20.42' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 3.95 cfs @ 4.28 fps)

**Summary for Pond DMH29:**

[57] Hint: Peaked at 20.42' (Flood elevation advised)

Inflow Area = 296,281 sf, 62.55% Impervious, Inflow Depth > 2.26" for 10yr24hr event  
 Inflow = 3.95 cfs @ 12.40 hrs, Volume= 55,742 cf  
 Outflow = 3.95 cfs @ 12.40 hrs, Volume= 55,742 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 3.95 cfs @ 12.40 hrs, Volume= 55,742 cf  
 Routed to Link L-D : HANNAFORD WETLAND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 20.42' @ 12.40 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	19.68'	<b>36.0" Round Culvert</b> L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 19.68' / 18.10' S= 0.0211 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf

**Primary OutFlow** Max=3.95 cfs @ 12.40 hrs HW=20.42' TW=0.00' (Dynamic Tailwater)  
 ↑**1=Culvert** (Inlet Controls 3.95 cfs @ 2.92 fps)

**Summary for Pond ST1:**

Inflow Area = 219,960 sf, 67.78% Impervious, Inflow Depth > 3.98" for 10yr24hr event  
 Inflow = 18.37 cfs @ 12.10 hrs, Volume= 72,903 cf  
 Outflow = 1.75 cfs @ 13.26 hrs, Volume= 30,294 cf, Atten= 90%, Lag= 69.5 min  
 Primary = 0.15 cfs @ 13.90 hrs, Volume= 7,285 cf  
 Routed to Pond DMH26 :  
 Secondary = 1.61 cfs @ 13.26 hrs, Volume= 23,009 cf  
 Routed to Pond DMH26 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 28.87' @ 13.26 hrs Surf.Area= 35,359 sf Storage= 46,294 cf

Plug-Flow detention time= 321.9 min calculated for 30,294 cf (42% of inflow)  
 Center-of-Mass det. time= 184.8 min ( 970.3 - 785.5 )

Volume	Invert	Avail.Storage	Storage Description
#1A	24.80'	18,783 cf	<b>92.08'W x 128.22'L x 6.75'H Field A</b> 79,695 cf Overall - 32,737 cf Embedded = 46,958 cf x 40.0% Voids
#2A	25.55'	32,737 cf	<b>ADS_StormTech MC-4500 b +Cap</b> x 300 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 300 Chambers in 10 Rows Cap Storage= 39.5 cf x 2 x 10 rows = 790.0 cf
#3	22.80'	4,710 cf	<b>92.00'W x 128.00'L x 2.00'H Prismaoid</b> 23,552 cf Overall x 20.0% Voids
#4	21.50'	6,124 cf	<b>92.00'W x 128.00'L x 1.30'H Prismaoid</b> 15,309 cf Overall x 40.0% Voids
		62,354 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Secondary	28.30'	<b>18.0" Round Culvert</b> L= 18.0' Ke= 0.500 Inlet / Outlet Invert= 28.30' / 27.95' S= 0.0194 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 3	21.80'	<b>6.0" Round Culvert</b> L= 10.0' Ke= 0.800 Inlet / Outlet Invert= 21.80' / 21.70' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Primary	21.80'	<b>1.5" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Primary OutFlow** Max=0.15 cfs @ 13.90 hrs HW=28.84' TW=22.46' (Dynamic Tailwater)

↳ **3=Orifice/Grate** (Orifice Controls 0.15 cfs @ 12.16 fps)

↳ **2=Culvert** (Passes 0.15 cfs of 1.99 cfs potential flow)

**Secondary OutFlow** Max=1.61 cfs @ 13.26 hrs HW=28.87' TW=22.53' (Dynamic Tailwater)

↳ **1=Culvert** (Inlet Controls 1.61 cfs @ 2.58 fps)

### Summary for Link L-D: HANNAFORD WETLAND

Inflow Area = 424,100 sf, 53.94% Impervious, Inflow Depth > 2.52" for 10yr24hr event  
 Inflow = 11.39 cfs @ 12.07 hrs, Volume= 89,025 cf  
 Primary = 11.39 cfs @ 12.07 hrs, Volume= 89,025 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

### Summary for Link L-E: WETLAND POCKET

Inflow Area = 21,194 sf, 38.33% Impervious, Inflow Depth > 2.70" for 10yr24hr event  
 Inflow = 1.04 cfs @ 12.28 hrs, Volume= 4,766 cf  
 Primary = 1.04 cfs @ 12.28 hrs, Volume= 4,766 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

### Summary for Link L-F: RTE 88 ROW

Inflow Area = 9,261 sf, 0.00% Impervious, Inflow Depth > 1.31" for 10yr24hr event  
 Inflow = 0.20 cfs @ 12.30 hrs, Volume= 1,014 cf  
 Primary = 0.20 cfs @ 12.30 hrs, Volume= 1,014 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## **Wakefield Thermal Building Expansion Exeter, NH Stormwater Operation & Maintenance Plan**

The project applicant, Wakefield Thermal Inc. (c/o Matt Van Zile), with a mailing address of 120 Northwest Boulevard, Nashua, NH 03063, shall be responsible for the maintenance and operation of the proposed stormwater collection system including routine inspection, cleaning and maintenance of manholes, deep sump catch basins, clean outs, the Stormtech chamber system and paved parking areas.

### **Schedule for Inspection and Maintenance after Construction:**

#### Paved Parking Area Sweeping:

- Sweeping efforts shall be conducted at least once per month outside of winter months.

#### Deep Sump Catch Basins, Drainage Manholes, Trench Drains, Outlet Structures:

- Inlets should be cleaned annually and inspected semi-annually.
- All sediments, floatables, and hydrocarbons should be properly handled and disposed, in accordance with local, state, and federal guidelines and regulations.
- All pipe inlets and outlets should be cleared from any obstructions immediately.

#### StormTech Systems:

- Isolator rows and pipe headers shall be inspected immediately after completion of the site's construction. The normal inspection schedule after construction for the Isolator rows is annually. Accumulated sediment shall be removed from the Isolator rows at least once per year. Pipe headers should be inspected quarterly after construction.
- Inspection of the Isolator rows shall involve a visual check using either the inspection ports or an access manhole.
- If upon visual inspection of the Isolator rows, it is found that sediment has accumulated to an average depth exceeding 3 inches, cleanout is required. At a minimum, accumulated sediment shall be removed from the Isolator rows once per year.
- Cleanout the Isolator rows using the JetVac process. A fixed culvert cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable. Apply multiple passes of JetVac until water is clean. Vacuum manhole and catch basin sumps as required.
- Replace all caps, lids, and covers and record observations and actions.
- Inspect and clean catch basins and manholes upstream of StormTech System.
- A site maintenance log shall be kept. This log will record the dates when maintenance tasks were completed, the person who completed the tasks, and any observations of malfunctions in components of the storm water management

system. Call 1-888-892-2694 to speak to a technical representative or visit [www.stormtech.com](http://www.stormtech.com).

#### Contech Jellyfish Filter:

Owner's manual has been attached.

If a filtration practice does not drain within 72 hours following a rainfall event, then a qualified professional should assess the condition of the facility to determine measures required to restore filtration function, including, but not limited to, removal of accumulated sediments or reconstruction of the infiltration system.

A site maintenance log will be kept. This log will record the dates when maintenance tasks were completed, the person who completed the task, and any observations of malfunctions in components of the stormwater management system. A sample maintenance log form is attached.

#### **Control of Invasive Plans:**

During maintenance activities, check for the presence of invasive plants. If invasive plants are found, they shall be controlled and removed in a safe manner as described on the following pages.

Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials or fresh produce. Invasive plants can cause harm by:

- Becoming weedy and overgrown;
- Killing established shade trees;
- Obstructing pipes and drainage systems
- Forming dense beds in water
- Lowering water levels in lakes, streams and wetlands
- Destroying natural communities
- Promoting erosion on stream banks and hillsides
- Resisting control except by hazardous chemicals.

#### **Deicing Practices:**

Additionally, if deicing materials are to be used on site, a deicing log shall be kept. This log will record the type and quantity of materials applied and the dates of said application.

**Wakefield Thermal Exeter, NH**  
**Stormwater Operation & Maintenance Management Plan**

<b>Best Management Practice</b>	<b>Minimum Frequency</b>	<b>Date Performed</b>	<b>Comments</b>	<b>Cleaning/Repair Needed Yes/No</b>	<b>Date of Cleaning/Repair</b>	<b>Performed By</b>
<b>Pavement Sweeping (all pavement)</b>	<b>Monthly (Except During Winter)</b>					
<b>Catch Basins Manholes Outlet Structures</b>	<b>Semi-Annual Inspections Annual Cleaning</b>					
<b>Stormtech Systems</b>	<b>Annual Inspections Annual Maintenance</b>					

---

Site Maintenance Supervisor:

Date:



**Wakefield Thermal Exeter, NH  
Deicing Log**

<b>Date Performed</b>	<b>Deicing Material</b>	<b>Quantity Applied</b>	<b>Performed By</b>

---

Site Maintenance Supervisor:

Date:

## CONTROL OF INVASIVE PLANTS

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described on the following pages. They should be controlled as described on the following pages.

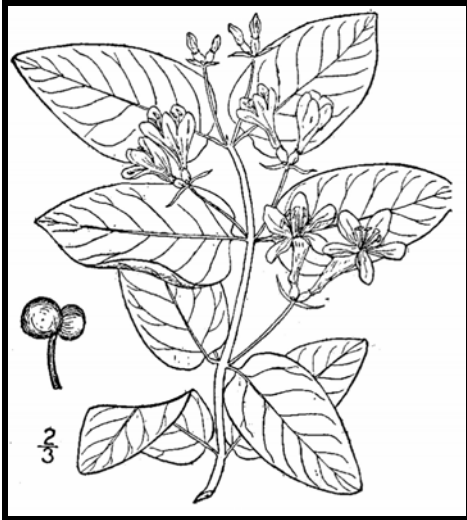
### Background:

Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.



Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



**Tatarian honeysuckle**

*Lonicera tatarica*

USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine

the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit [www.nhinvasives.org](http://www.nhinvasives.org) or contact your UNH Cooperative Extension office.

### **New Hampshire Regulations**

Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

## How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag “head first” at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

**Burning:** Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can't be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn't be burned as the seeds may disperse by the hot air created by the fire.

**Bagging (solarization):** Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

**Tarping and Drying:** Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

**Chipping:** Use this method for woody plants that don't reproduce vegetatively.

**Burying:** This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

**Drowning:** Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn't used often. Be prepared for an awful stink!

**Composting:** Invasive plants can take root in compost. Don't compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.






**Japanese knotweed**  
*Polygonum cuspidatum*  
USDA-NRCS PLANTS Database /  
Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 676.

**Be diligent looking for seedlings for years in areas where removal and disposal took place.**

## Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

Woody Plants	Method of Reproducing	Methods of Disposal
Norway maple <i>(Acer platanoides)</i> European barberry <i>(Berberis vulgaris)</i> Japanese barberry <i>(Berberis thunbergii)</i> autumn olive <i>(Elaeagnus umbellata)</i> burning bush <i>(Euonymus alatus)</i> Morrow's honeysuckle <i>(Lonicera morrowii)</i> Tatarian honeysuckle <i>(Lonicera tatarica)</i> showy bush honeysuckle <i>(Lonicera x bella)</i> common buckthorn <i>(Rhamnus cathartica)</i> glossy buckthorn <i>(Frangula alnus)</i>		<p><b>Prior to fruit/seed ripening</b></p> <p>Seedlings and small plants</p> <ul style="list-style-type: none"> <li>▪ Pull or cut and leave on site with roots exposed. No special care needed.</li> </ul> <p>Larger plants</p> <ul style="list-style-type: none"> <li>▪ Use as firewood.</li> <li>▪ Make a brush pile.</li> <li>▪ Chip.</li> <li>▪ Burn.</li> </ul>
		<p><b>After fruit/seed is ripe</b></p> <p>Don't remove from site.</p> <ul style="list-style-type: none"> <li>▪ Burn.</li> <li>▪ Make a covered brush pile.</li> <li>▪ Chip once all fruit has dropped from branches.</li> <li>▪ Leave resulting chips on site and monitor.</li> </ul>
oriental bittersweet <i>(Celastrus orbiculatus)</i> multiflora rose <i>(Rosa multiflora)</i>		<p><b>Prior to fruit/seed ripening</b></p> <p>Seedlings and small plants</p> <ul style="list-style-type: none"> <li>▪ Pull or cut and leave on site with roots exposed. No special care needed.</li> </ul> <p>Larger plants</p> <ul style="list-style-type: none"> <li>▪ Make a brush pile.</li> <li>▪ Burn.</li> </ul>
		<p><b>After fruit/seed is ripe</b></p> <p>Don't remove from site.</p> <ul style="list-style-type: none"> <li>▪ Burn.</li> <li>▪ Make a covered brush pile.</li> <li>▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.</li> </ul>

Non-Woody Plants	Method of Reproducing	Methods of Disposal
<p>garlic mustard (<i>Alliaria petiolata</i>)</p> <p>spotted knapweed (<i>Centaurea maculosa</i>)</p> <ul style="list-style-type: none"> <li>▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling.</li> </ul> <p>black swallow-wort (<i>Cynanchum nigrum</i>)</p> <ul style="list-style-type: none"> <li>▪ May cause skin rash. Wear gloves and long sleeves when handling.</li> </ul> <p>pale swallow-wort (<i>Cynanchum rossicum</i>)</p> <p>giant hogweed (<i>Heracleum mantegazzianum</i>)</p> <ul style="list-style-type: none"> <li>▪ Can cause major skin rash. Wear gloves and long sleeves when handling.</li> </ul> <p>dame's rocket (<i>Hesperis matronalis</i>)</p> <p>perennial pepperweed (<i>Lepidium latifolium</i>)</p> <p>purple loosestrife (<i>Lythrum salicaria</i>)</p> <p>Japanese stilt grass (<i>Microstegium vimineum</i>)</p> <p>mile-a-minute weed (<i>Polygonum perfoliatum</i>)</p>	<p><b>Fruits and Seeds</b></p> 	<p><b>Prior to flowering</b></p> <p>Depends on scale of infestation</p> <p>Small infestation</p> <ul style="list-style-type: none"> <li>▪ Pull or cut plant and leave on site with roots exposed.</li> </ul> <p>Large infestation</p> <ul style="list-style-type: none"> <li>▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting).</li> <li>▪ Monitor. Remove any re-sprouting material.</li> </ul> <hr/> <p><b>During and following flowering</b></p> <p>Do nothing until the following year or remove flowering heads and bag and let rot.</p> <p>Small infestation</p> <ul style="list-style-type: none"> <li>▪ Pull or cut plant and leave on site with roots exposed.</li> </ul> <p>Large infestation</p> <ul style="list-style-type: none"> <li>▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting).</li> <li>▪ Monitor. Remove any re-sprouting material.</li> </ul>
<p>common reed (<i>Phragmites australis</i>)</p> <p>Japanese knotweed (<i>Polygonum cuspidatum</i>)</p> <p>Bohemian knotweed (<i>Polygonum x bohemicum</i>)</p>	<p><b>Fruits, Seeds, Plant Fragments</b></p> <p>Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.</p>	<p><b>Small infestation</b></p> <ul style="list-style-type: none"> <li>▪ Bag all plant material and let rot.</li> <li>▪ Never pile and use resulting material as compost.</li> <li>▪ Burn.</li> </ul> <p><b>Large infestation</b></p> <ul style="list-style-type: none"> <li>▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile.</li> <li>▪ Monitor and remove any sprouting material.</li> <li>▪ Pile, let dry, and burn.</li> </ul>

January 2010

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**Jellyfish<sup>®</sup> Filter  
Owner's Manual**



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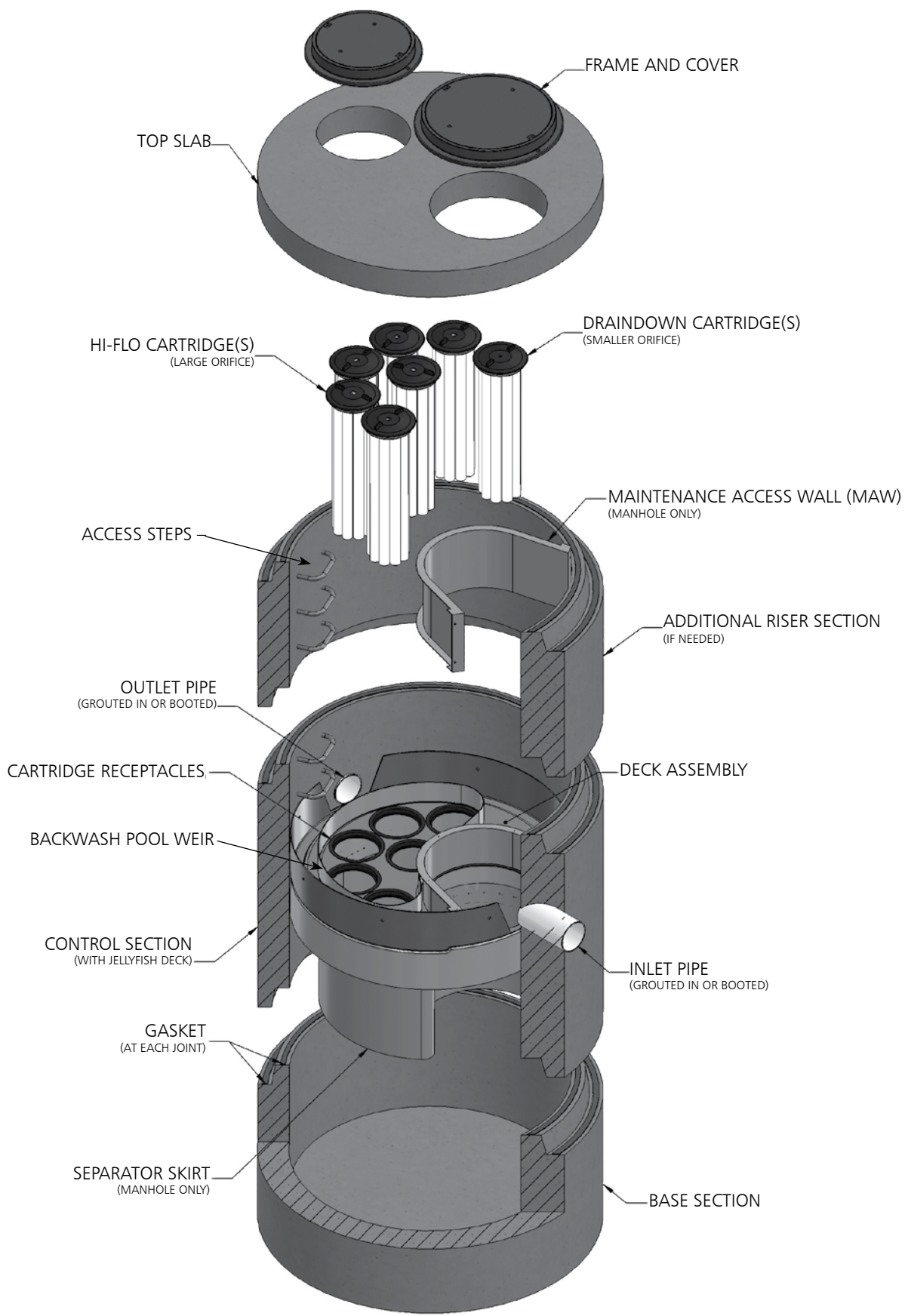
## THANK YOU FOR PURCHASING THE JELLYFISH® FILTER!

Contech Engineered Solutions would like to thank you for selecting the Jellyfish Filter to meet your project’s stormwater treatment needs. With proper inspection and maintenance, the Jellyfish Filter is designed to deliver ongoing, high levels of stormwater pollutant removal.

If you have any questions, please feel free to call us or e-mail us:

**Contech Engineered Solutions**  
9025 Centre Pointe Drive, Suite 400 | West Chester, OH 45069  
513-645-7000 | 800-338-1122  
www.ContechES.com  
info@conteches.com





## WARNINGS / CAUTION

1. FALL PROTECTION may be required.
2. WATCH YOUR STEP if standing on the Jellyfish Filter Deck at any time; Great care and safety must be taken while walking or maneuvering on the Jellyfish Filter Deck. Attentive care must be taken while standing on the Jellyfish Filter Deck at all times to prevent stepping onto a lid, into or through a cartridge hole or slipping on the deck.
3. The Jellyfish Filter Deck can be SLIPPERY WHEN WET.
4. If the Top Slab, Covers or Hatches have not yet been installed, or are removed for any reason, great care must be taken to NOT DROP ANYTHING ONTO THE JELLYFISH FILTER DECK. The Jellyfish Filter Deck and Cartridge Receptacle Rings can be damaged under high impact loads. This type of activity voids all warranties. All damaged items to be replaced at owner's expense.
5. Maximum deck load 2 persons, total weight 450 lbs.

## Safety Notice

Jobsite safety is a topic and practice addressed comprehensively by others. The inclusions here are intended to be reminders to whole areas of Safety Practice that are the responsibility of the Owner(s), Manager(s) and Contractor(s). OSHA and Canadian OSH, and Federal, State/Provincial, and Local Jurisdiction Safety Standards apply on any given site or project. The knowledge and applicability of those responsibilities is the Contractor's responsibility and outside the scope of Contech Engineered Solutions.

## Confined Space Entry

Secure all equipment and perform all training to meet applicable local and OSHA regulations regarding confined space entry. It is the Contractor's or entry personnel's responsibility to proceed safely at all times.

## Personal Safety Equipment

Contractor is responsible to provide and wear appropriate personal protection equipment as needed including, but not limited to safety boots, hard hat, reflective vest, protective eyewear, gloves and fall protection equipment as necessary. Make sure all equipment is staffed with trained and/or certified personnel, and all equipment is checked for proper operation and safety features prior to use.

- Fall protection equipment
- Eye protection
- Safety boots
- Ear protection
- Gloves
- Ventilation and respiratory protection
- Hard hat
- Maintenance and protection of traffic plan

## Chapter 1

### 1.0 – Owner Specific Jellyfish Filter Product Information

Below you will find a reference page that can be filled out according to your Jellyfish Filter specification to help you easily inspect, maintain and order parts for your system.

Owner Name:	
Phone Number:	
Site Address:	
Site GPS Coordinates/unit location:	
Unit Location Description:	
Jellyfish Filter Model No.:	
Contech Project & Sequence Number	
No. of Hi-Flo Cartridges	
No. of Cartridges:	
Length of Draindown Cartridges:	
No. of Blank Cartridge Lids:	
Bypass Configuration (Online/Offline):	

### Notes:

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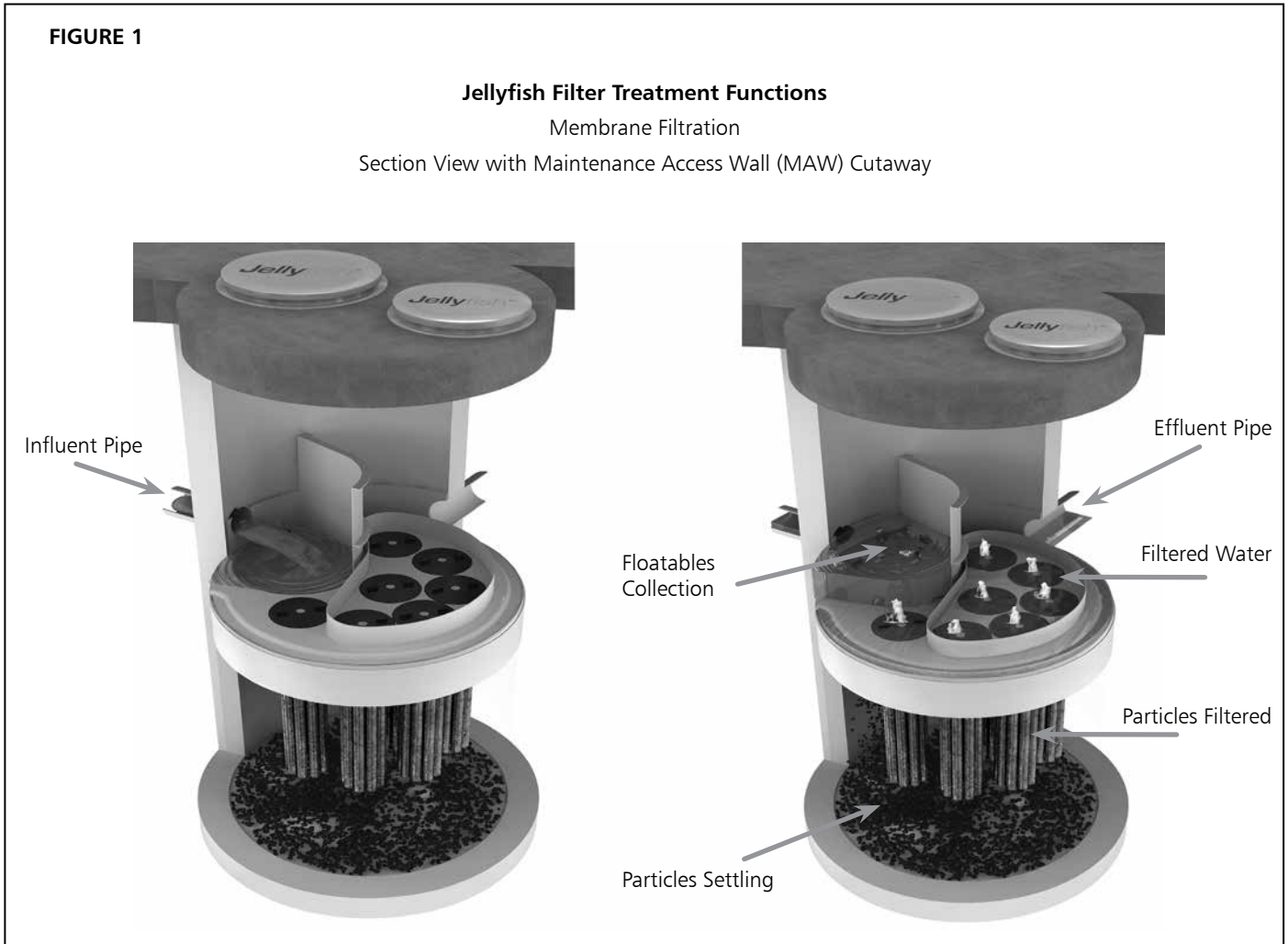
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## Chapter 2

### 2.0 – Jellyfish Filter System Operations and Functions

The Jellyfish Filter is an engineered stormwater quality treatment technology that removes a high level and wide variety of stormwater pollutants. Each Jellyfish Filter cartridge consists of eleven membrane - encased filter elements (“filtration tentacles”) attached to a cartridge head plate. The filtration tentacles provide a large filtration surface area, resulting in high flow and high pollutant removal capacity.

The Jellyfish Filter functions are depicted in Figure 1 below.



Jellyfish Filter cartridges are backwashed after each peak storm event, which removes accumulated sediment from the membranes. This backwash process extends the service life of the cartridges and increases the time between maintenance events.

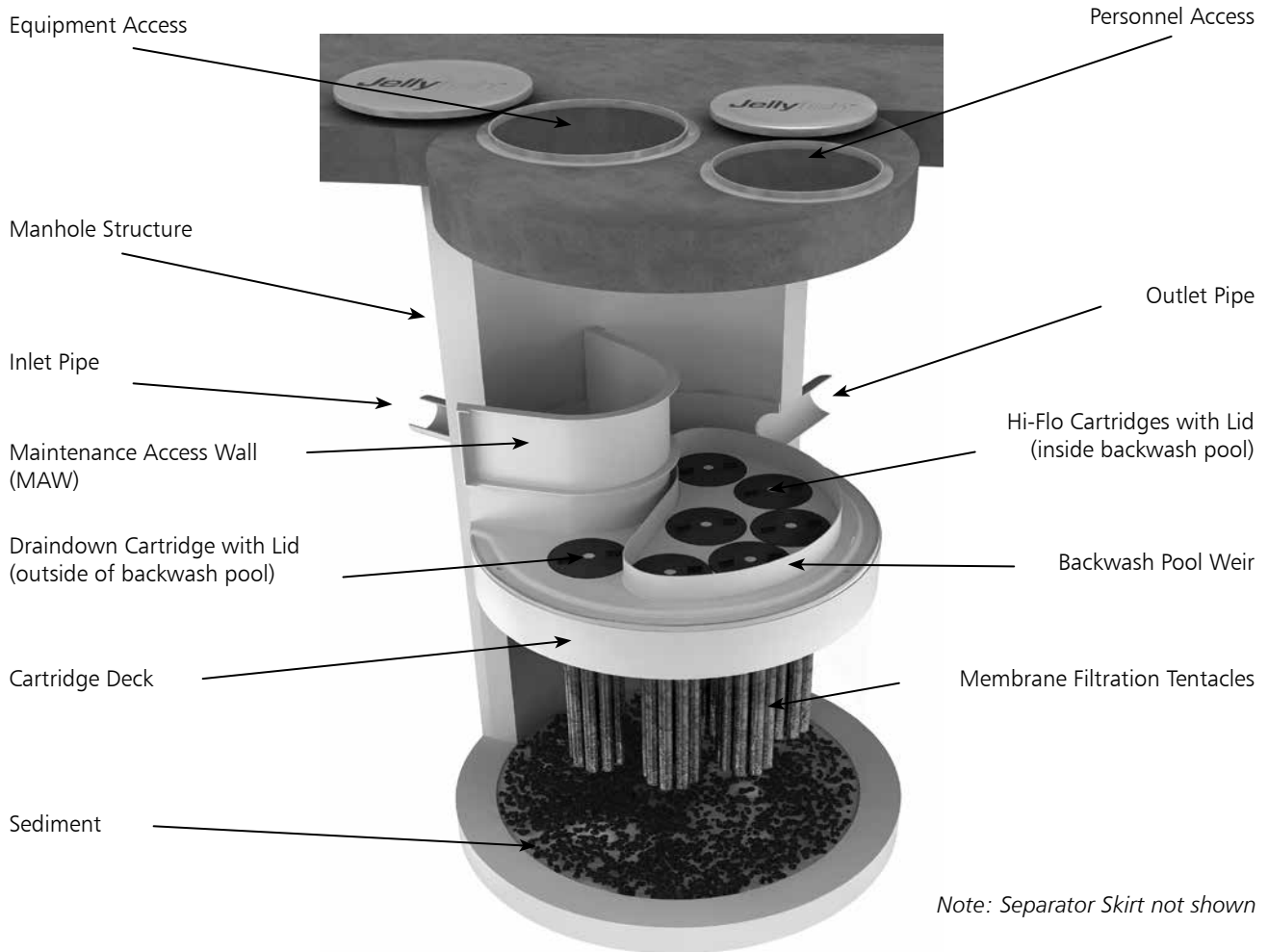
For additional details on the operation and pollutant capabilities of the Jellyfish Filter please refer to additional details on our website at [www.ContechES.com](http://www.ContechES.com).

## 2.1 – Components and Cartridges

The Jellyfish Filter and components are depicted in Figure 2 below.

**FIGURE 2**

### Jellyfish Filter Components



Tentacles are available in various lengths as depicted in Table 1 below.

Table 1 – Cartridge Lengths / Weights and Cartridge Lid Orifice Diameters

Cartridge Lengths	Dry Weight	Hi-Flo Orifice Diameter	Draindown Orifice Diameter
15 inches (381 mm)	10 lbs (4.5 kg)	35 mm	20 mm
27 inches (686 mm)	14.5 lbs (6.6 kg)	45 mm	25 mm
40 inches (1,016 mm)	19.5 lbs (8.9 kg)	55 mm	30 mm
54 inches (1,372 mm)	25 lbs (11.4 kg)	70 mm	35 mm

## 2.2 – Jellyfish Membrane Filtration Cartridge Assembly

The Jellyfish Filter utilizes multiple membrane filtration cartridges. Each cartridge consists of removable cylindrical filtration “tentacles” attached to a cartridge head plate. Each filtration tentacle has a threaded pipe nipple and o-ring. To attach, insert the top pipe nipples with the o-ring through the head plate holes and secure with locking nuts. Hex nuts to be hand tightened and checked with a wrench as shown below.

## 2.3 – Jellyfish Membrane Filtration Cartridge Installation

- Cartridge installation will be performed by trained individuals and coordinated with the installing site Contractor. Flow diversion devices are required to be in place until the site is stabilized (final paving and landscaping in place). Failure to address this step completely will reduce the time between required maintenance.
- Descend to the cartridge deck (see Safety Notice and page 3).
- Refer to Contech's submittal drawings to determine proper quantity and placement of Hi-Flo, Draindown and Blank cartridges with appropriate lids. Lower the Jellyfish membrane filtration cartridges into the cartridge receptacles within the cartridge deck. It is possible that not all cartridge receptacles will be filled with a filter cartridge. In that case, a blank headplate and blank cartridge lid (no orifice) would be installed.



**Cartridge Assembly**

Do not force the tentacles down into the cartridge receptacle, as this may damage the membranes. Apply downward pressure on the cartridge head plate to seat the lubricated rim gasket (thick circular gasket surrounding the circumference of the head plate) into the cartridge receptacle. (See Figure 3 for details on approved lubricants for use with rim gasket.)

- Examine the cartridge lids to differentiate lids with a small orifice, a large orifice, and no orifice.
  - Lids with a small orifice are to be inserted into the Draindown cartridge receptacles, outside of the backwash pool weir.
  - Lids with a large orifice are to be inserted into the Hi-Flo cartridge receptacles within the backwash pool weir.
  - Lids with no orifice (blank cartridge lids) and a blank headplate are to be inserted into unoccupied cartridge receptacles.
- To install a cartridge lid, align both cartridge lid male threads with the cartridge receptacle female threads before rotating approximately 1/3 of a full rotation until firmly seated. Use of an approved rim gasket lubricant may facilitate installation.

### 3.0 Inspection and Maintenance Overview

The primary purpose of the Jellyfish® Filter is to capture and remove pollutants from stormwater runoff. As with any filtration system, these pollutants must be removed to maintain the filter's maximum treatment performance. Regular inspection and maintenance are required to insure proper functioning of the system. Maintenance frequencies and requirements are site specific and vary depending on pollutant loading. Additional maintenance activities may be required in the event of non-storm event runoff, such as base-flow or seasonal flow, an upstream chemical spill or due to excessive sediment loading from site erosion or extreme runoff events. It is a good practice to inspect the system after major storm events.

Inspection activities are typically conducted from surface observations and include:

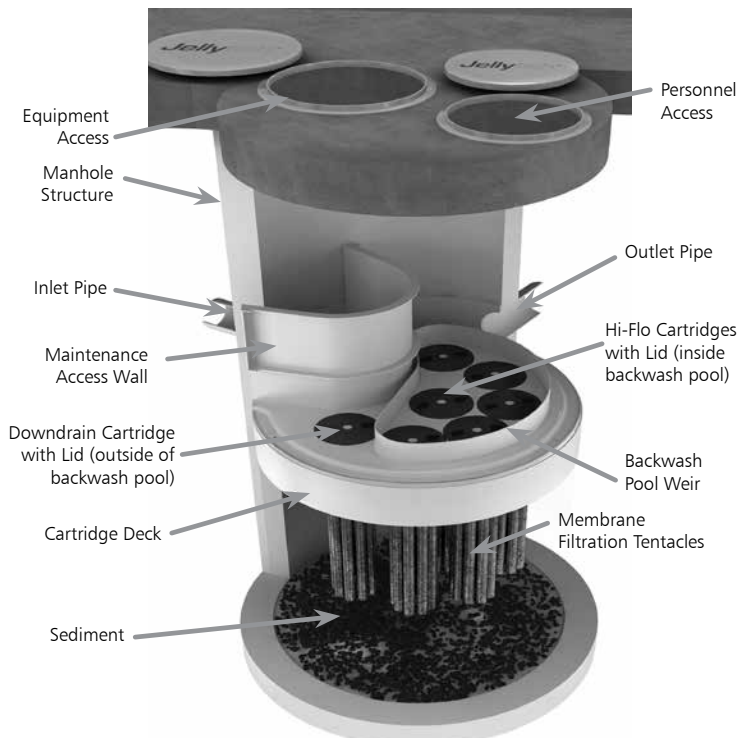
- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

Maintenance activities include:

- Removal of oil, floatable trash and debris
- Removal of collected sediments
- Rinsing and re-installing the filter cartridges
- Replace filter cartridge tentacles, as needed

### 4.0 Inspection Timing

Inspection of the Jellyfish Filter is key in determining the maintenance requirements for, and to develop a history of, the site's pollutant loading characteristics. In general, inspections should be performed at the times indicated below; *or per the approved project stormwater quality documents (if applicable), whichever is more frequent.*



Note: Separator Skirt not shown

1. A minimum of quarterly inspections during the first year of operation to assess the sediment and floatable pollutant accumulation, and to ensure proper functioning of the system.
2. Inspection frequency in subsequent years is based on the inspection and maintenance plan developed in the first year of operation. Minimum frequency should be once per year.
3. Inspection is recommended after each major storm event.
4. Inspection is required immediately after an upstream oil, fuel or other chemical spill.

### 5.0 Inspection Procedure

The following procedure is recommended when performing inspections:

1. Provide traffic control measures as necessary.
2. Inspect the MAW or inlet bay for floatable pollutants such as trash, debris, and oil sheen.
3. Measure oil and sediment depth in several locations, by lowering a sediment probe until contact is made with the floor of the structure. Record sediment depth, and presences of any oil layers.
4. Inspect cartridge lids. Missing or damaged cartridge lids to be replaced.
5. Inspect the MAW (where appropriate), cartridge deck and receptacles, and backwash pool weir, for damaged or broken components.

#### 5.1 Dry weather inspections

- Inspect the cartridge deck for standing water, and/or sediment on the deck.
- No standing water under normal operating conditions.
- Standing water inside the backwash pool, but not outside the backwash pool indicates, that the filter cartridges need to be rinsed.



Inspection Utilizing Sediment Probe

- Standing water outside the backwash pool is not anticipated and may indicate a backwater condition caused by high water elevation in the receiving water body, or possibly a blockage in downstream infrastructure.
- Any appreciable sediment ( $\geq 1/16''$ ) accumulated on the deck surface should be removed.

## 5.2 Wet weather inspections

- Observe the rate and movement of water in the unit. Note the depth of water above deck elevation within the MAW or inlet bay.
- Less than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges (i.e. cartridges located outside the backwash pool).
- Greater than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges and each of the hi-flo cartridges (i.e. cartridges located inside the backwash pool), and water should be overflowing the backwash pool weir.
- 18 inches or greater and relatively little flow is exiting the cartridge lids and outlet pipe, this condition indicates that the filter cartridges need to be rinsed.

## 6.0 Maintenance Requirements

Required maintenance for the Jellyfish Filter is based upon results of the most recent inspection, historical maintenance records, or the site specific water quality management plan; whichever is more frequent. In general, maintenance requires some combination of the following:

1. Sediment removal for depths reaching 12 inches or greater, or within 3 years of the most recent sediment cleaning, whichever occurs sooner.
2. Floatable trash, debris, and oil removal.
3. Deck cleaned and free from sediment.
4. Filter cartridges rinsed and re-installed as required by the most recent inspection results, or within 12 months of the most recent filter rinsing, whichever occurs sooner.
5. Replace tentacles if rinsing does not restore adequate hydraulic capacity, remove accumulated sediment, or if damaged or missing. It is recommended that tentacles should remain in service no longer than 5 years before replacement.
6. Damaged or missing cartridge deck components must be repaired or replaced as indicated by results of the most recent inspection.
7. The unit must be cleaned out and filter cartridges inspected immediately after an upstream oil, fuel, or chemical spill. Filter cartridge tentacles should be replaced if damaged or compromised by the spill.

## 7.0 Maintenance Procedure

The following procedures are recommended when maintaining the Jellyfish Filter:

1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage.*
3. Perform Inspection Procedure prior to maintenance activity.

4. To access the cartridge deck for filter cartridge service, descend into the structure and step directly onto the deck. *Caution: Do not step onto the maintenance access wall (MAW) or backwash pool weir, as damage may result. Note that the cartridge deck may be slippery.*
5. Maximum weight of maintenance crew and equipment on the cartridge deck not to exceed 450 lbs.

### 7.1 Filter Cartridge Removal

1. Remove a cartridge lid.
2. Remove cartridges from the deck using the lifting loops in the cartridge head plate. Rope or a lifting device (available from Contech) should be used. *Caution: Should a snag occur, do not force the cartridge upward as damage to the tentacles may result. Wet cartridges typically weigh between 100 and 125 lbs.*
3. Replace and secure the cartridge lid on the exposed empty receptacle as a safety precaution. Contech does not recommend exposing more than one empty cartridge receptacle at a time.

### 7.2 Filter Cartridge Rinsing

1. Remove all 11 tentacles from the cartridge head plate. Take care not to lose or damage the O-ring seal as well as the plastic threaded nut and connector.
2. Position tentacles in a container (or over the MAW), with the



Cartridge Removal & Lifting Device



threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.

3. Using the Jellyfish rinse tool (available from Contech) or a low-pressure garden hose sprayer, direct water spray onto the tentacle membrane, sweeping from top to bottom along the length of the tentacle. Rinse until all sediment is removed from the membrane. *Caution: Do not use a high pressure sprayer or focused stream of water on the membrane. Excessive water pressure may damage the membrane.*
4. Collected rinse water is typically removed by vacuum hose.

5. Reassemble cartridges as detailed later in this document. Reuse O-rings and nuts, ensuring proper placement on each tentacle.

### 7.3 Sediment and Floatables Extraction

1. Perform vacuum cleaning of the Jellyfish Filter only after filter cartridges have been removed from the system. Access the lower chamber for vacuum cleaning only through the maintenance access wall (MAW) opening. Be careful not to damage the flexible plastic separator skirt that is attached to the underside of the deck on manhole systems. Do not lower the vacuum wand through a cartridge receptacle, as damage to the receptacle will result.
2. Vacuum floatable trash, debris, and oil, from the MAW opening or inlet bay. Alternatively, floatable solids may be removed by a net or skimmer.
3. Pressure wash cartridge deck and receptacles to remove all



*Rinsing Cartridge with Contech Rinse Tool*

sediment and debris. Sediment should be rinsed into the sump area. Take care not to flush rinse water into the outlet pipe.

4. Remove water from the sump area. Vacuum or pump equipment should only be introduced through the MAW or inlet bay.
5. Remove the sediment from the bottom of the unit through the MAW or inlet bay opening.
6. For larger diameter Jellyfish Filter manholes ( $\geq 8$ -ft) and some



*Vacuuming Sump Through MAW*

vaults complete sediment removal may be facilitated by removing a cartridge lid from an empty receptacle and inserting a jetting wand (not a vacuum wand) through the receptacle. Use the sprayer to rinse loosened sediment toward the vacuum hose in the MAW opening, being careful not to damage the receptacle.

### 7.4 Filter Cartridge Reinstallation and Replacement

1. Cartridges should be installed after the deck has been cleaned. It is important that the receptacle surfaces be free from grit and debris.
2. Remove cartridge lid from deck and carefully lower the filter cartridge into the receptacle until head plate gasket is seated squarely in receptacle. *Caution: Do not force the cartridge downward; damage may occur.*
3. Replace the cartridge lid and check to see that both male threads are properly seated before rotating approximately 1/3 of a full rotation until firmly seated. Use of an approved rim gasket lubricant may facilitate installation. See next page for additional details.
4. If rinsing is ineffective in removing sediment from the tentacles, or if tentacles are damaged, provisions must be made to replace the spent or damaged tentacles with new tentacles. Contact Contech to order replacement tentacles.

### 7.5 Chemical Spills

*Caution: If a chemical spill has been captured, do not attempt maintenance. Immediately contact the local hazard response agency and contact Contech.*

### 7.6 Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads. Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.



# Jellyfish Filter Components & Filter Cartridge Assembly and Installation

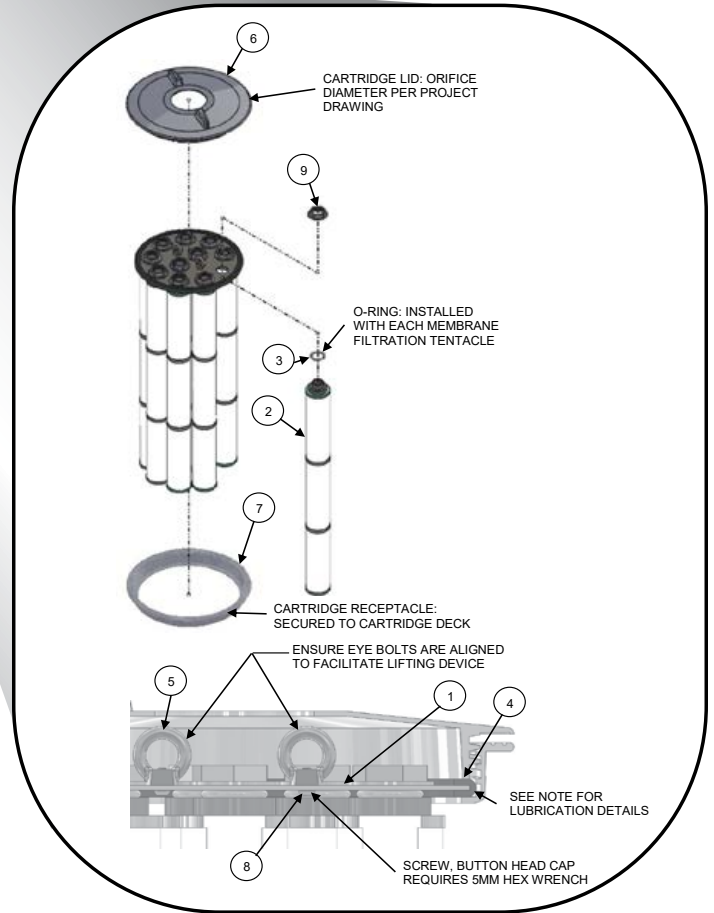
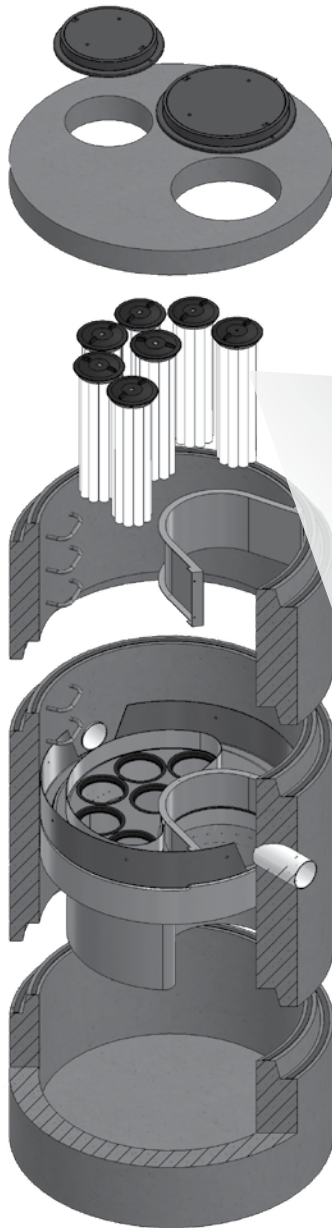


TABLE 1: BOM

ITEM NO.	DESCRIPTION
1	JF HEAD PLATE
2	JF TENTACLE
3	JF O-RING
4	JF HEAD PLATE GASKET
5	JF CARTRIDGE EYELET
6	JF 14IN COVER
7	JF RECEPTACLE
8	BUTTON HEAD CAP SCREW M6X14MM SS
9	JF CARTRIDGE NUT

TABLE 2: APPROVED GASKET LUBRICANTS

PART NO.	MFR	DESCRIPTION
78713	LA-CO	LUBRI-JOINT
40501	HERCULES	DUCK BUTTER
30600	OATEY	PIPE LUBRICANT
PSLUBXL1Q	PROSELECT	PIPE JOINT LUBRICANT

## NOTES:

### Head Plate Gasket Installation:

Install Head Plate Gasket (Item 4) onto the Head Plate (Item 1) and liberally apply a lubricant from Table 2: Approved Gasket Lubricants onto the gasket where it contacts the Receptacle (Item 7) and Cartridge Lid (Item 6). Follow Lubricant manufacturer's instructions.

### Lid Assembly:

Rotate Cartridge Lid counter-clockwise until both male threads drop down and properly seat. Then rotate Cartridge Lid clock-wise approximately one-third of a full rotation until Cartridge Lid is firmly secured, creating a watertight seal.

# Jellyfish Filter Inspection and Maintenance Log

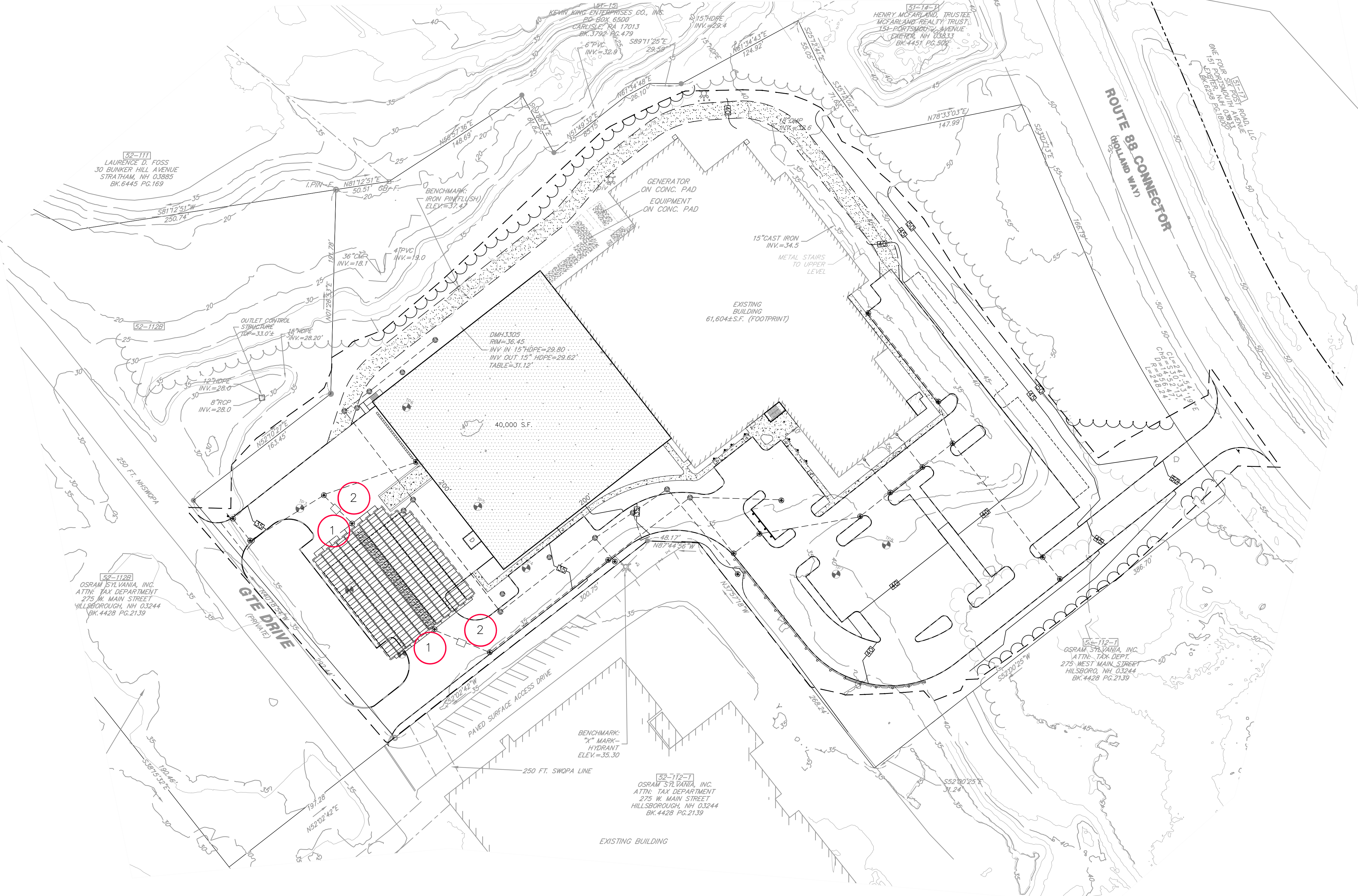
Owner: \_\_\_\_\_ Jellyfish Model No.: \_\_\_\_\_

Location: \_\_\_\_\_ GPS Coordinates: \_\_\_\_\_

Land Use:      Commercial: \_\_\_\_\_      Industrial: \_\_\_\_\_      Service Station: \_\_\_\_\_

                 Road/Highway: \_\_\_\_\_      Airport: \_\_\_\_\_      Residential: \_\_\_\_\_      Parking Lot: \_\_\_\_\_

Date/Time:					
Inspector:					
Maintenance Contractor:					
Visible Oil Present: (Y/N)					
Oil Quantity Removed					
Floatable Debris Present: (Y/N)					
Floatable Debris removed: (Y/N)					
Water Depth in Backwash Pool					
Cartridges externally rinsed/re-commissioned: (Y/N)					
New tentacles put on Cartridges: (Y/N)					
Sediment Depth Measured: (Y/N)					
Sediment Depth (inches or mm):					
Sediment Removed: (Y/N)					
Cartridge Lids intact: (Y/N)					
Observed Damage:					
Comments:					



**LEGEND**

- 1 STORMTECH MANIFOLD AND ISOLATOR ROW
- 2 JELLYFISH PEAK FLOW RATE DIVERSION UNITS
- ALL CATCH BASINS ON PROPERTY

**SITE DEVELOPMENT PLANS**

TAX MAP 52 LOT 112A  
**INSPECTION AND MAINTENANCE MAP**  
**C/A DESIGN, INC.**  
**131 PORTSMOUTH AVE. EXETER NH**  
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**NH EXETER PROPERTIES, LLC**  
 PREPARED FOR  
**C/A DESIGN, INC.**

**SCALE: 1"=50'** **FEBRUARY 28, 2023**

HORIZONTAL SCALE 1"=50'  
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REV	DATE	DESCRIPTION	DR	CK

**TFM**

Civil Engineers  
 Structural Engineers  
 Traffic Engineers  
 Land Surveyors  
 Landscape Architects  
 Scientists

48 Constitution Drive  
 Bedford, NH 03110  
 Phone (603) 472-4488  
 Fax (603) 472-9747  
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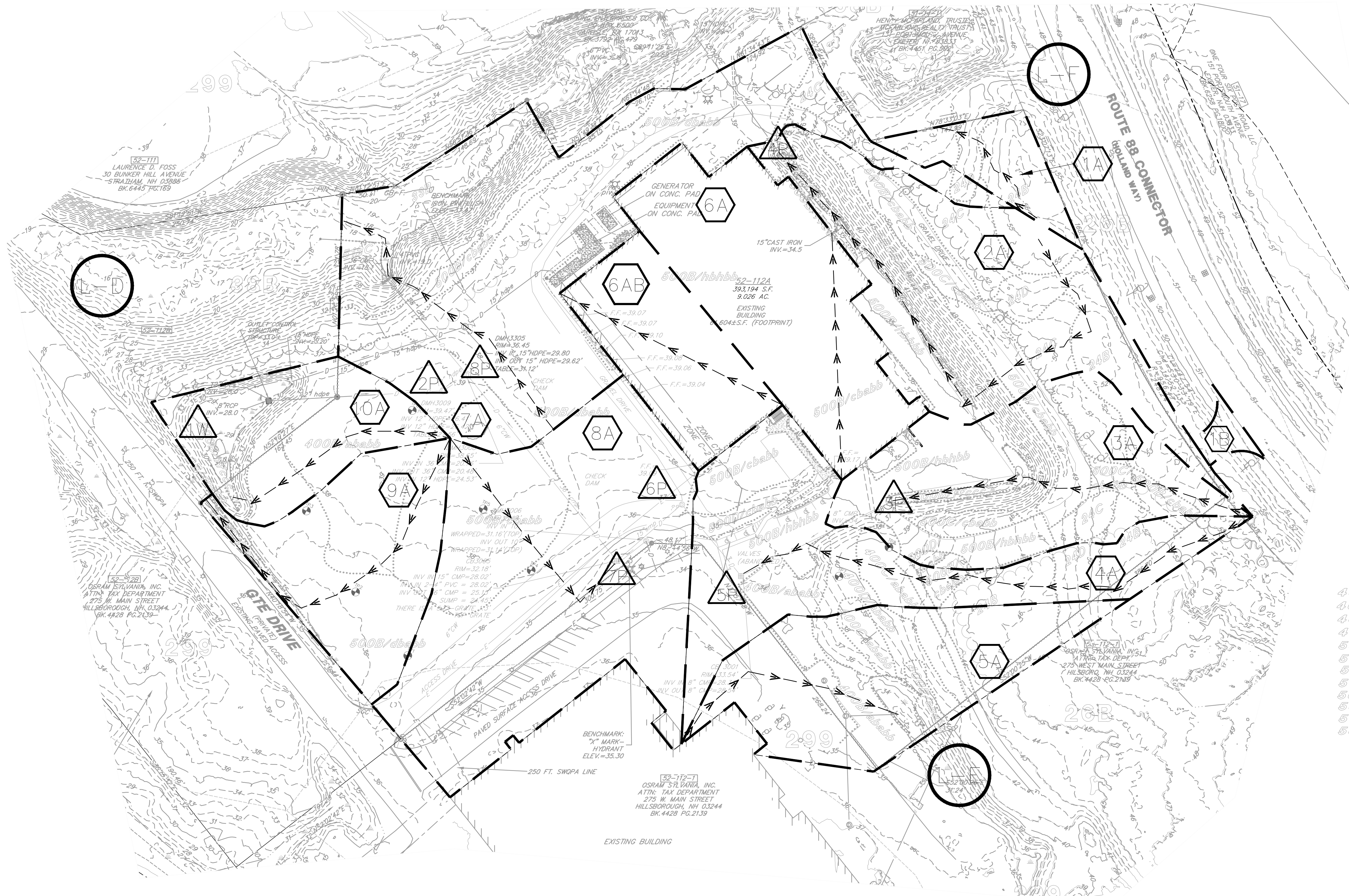
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**LEGEND**

- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION
- 5 SUBCATCHMENT
- 1 POND
- 9 REACH
- D DISCHARGE POINT

**NRCS SOILS LEGEND**

SYMBOL	MAP UNIT	SLOPE	HSG
26B	WINDSOR LOAMY SAND	3-8%	A
33A	SCITICO SILT LOAM	0-5%	D
38B	ELDRIDGE FINE SANDY LOAM	3-8%	D
533A	SQUAMSCOTT FINE SANDY LOAM	0-5%	D
699	URBAN LAND	NA	NOT RATED (D)
299	UDORTHERTS, SMOOTHED	NA	NOT RATED (D)

**SITE SPECIFIC SOILS LEGEND**

SYMBOL	MAP UNIT	SLOPE	DRAINAGE	HSG
24B	AGAWAM FINE SANDY LOAM	0-8%	WELL	B
24C	AGAWAM FINE SANDY LOAM	8-15%	WELL	B
24D	AGAWAM FINE SANDY LOAM	0-8%	WELL	B
24E	AGAWAM FINE SANDY LOAM	8-15%	WELL	B
33B	SCITICO SILT LOAM	15-25%	POORLY	C
512C	NINGRET FINE SANDY LOAM	8-15%	MODERATELY WELL	B
400B/ababb	UDORTHERTS, SANDY	0-8%	EXCESSIVELY	A
400C/ababb	UDORTHERTS, SANDY	8-15%	EXCESSIVELY	A
400D/ababb	UDORTHERTS, SANDY	15-25%	EXCESSIVELY	A
400E/ababb	UDORTHERTS, SANDY	25%+	EXCESSIVELY	A
500B/cbabb	UDORTHERTS, LOAMY	0-8%	WELL	B
500B/dbabb	UDORTHERTS, LOAMY	0-3%	MODERATELY WELL	B
500B/ffccc	UDORTHERTS, LOAMY	0-8%	POORLY	C
500B/hbhabb	UDORTHERTS, LOAMY	0-8%	UNDETERMINABLE	B
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500D/cbabb	UDORTHERTS, LOAMY	15-25%	WELL	B
500E/cbabb	UDORTHERTS, LOAMY	25%	WELL	B
500B/dbaab	UDORTHERTS, LOAMY	0-8%	MODERATELY WELL	B

**SITE DEVELOPMENT PLANS**


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**PRE DEVELOPMENT DRAINAGE MAP**  
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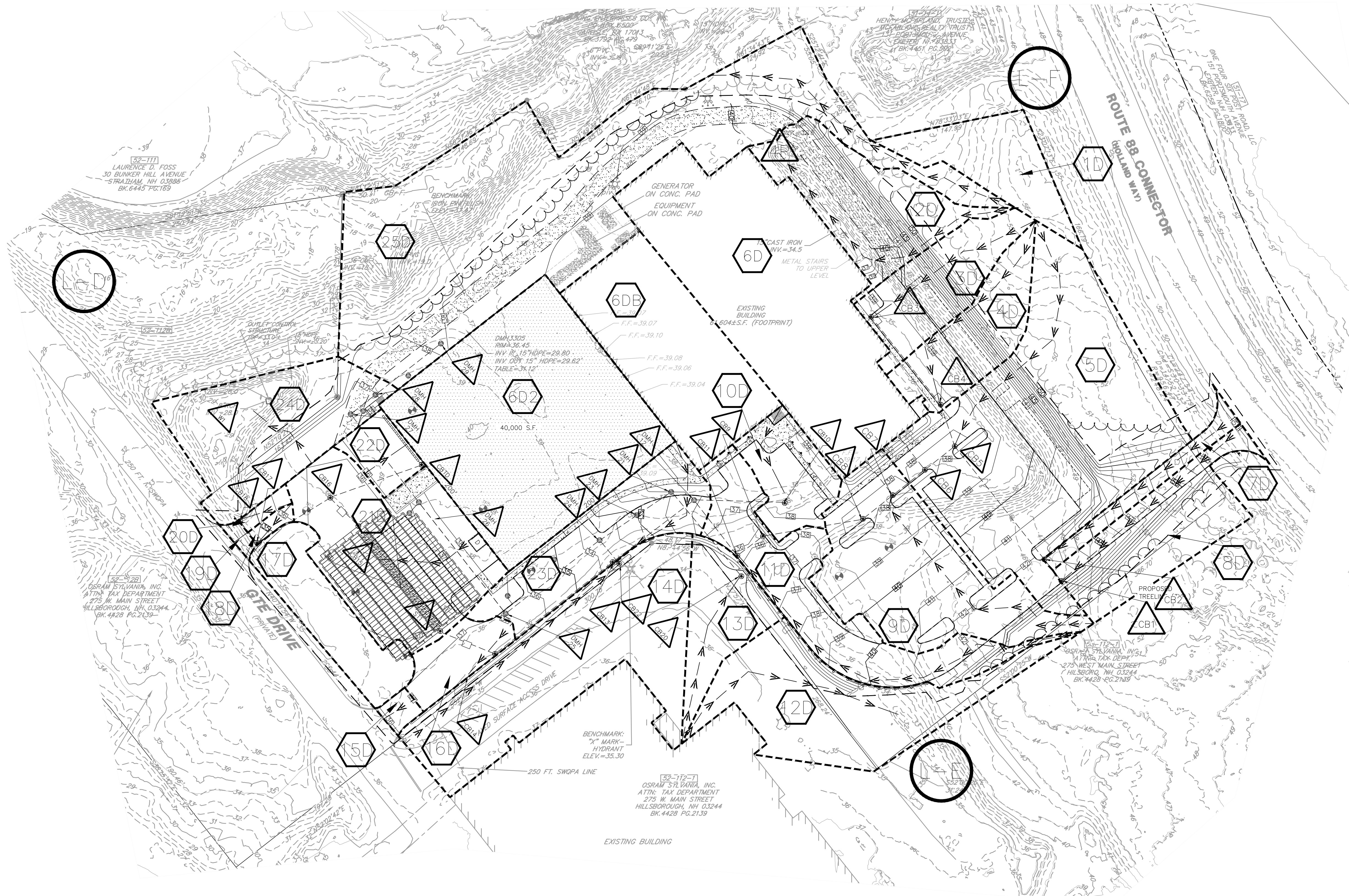
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**POST DEVELOPMENT DRAINAGE MAP**  
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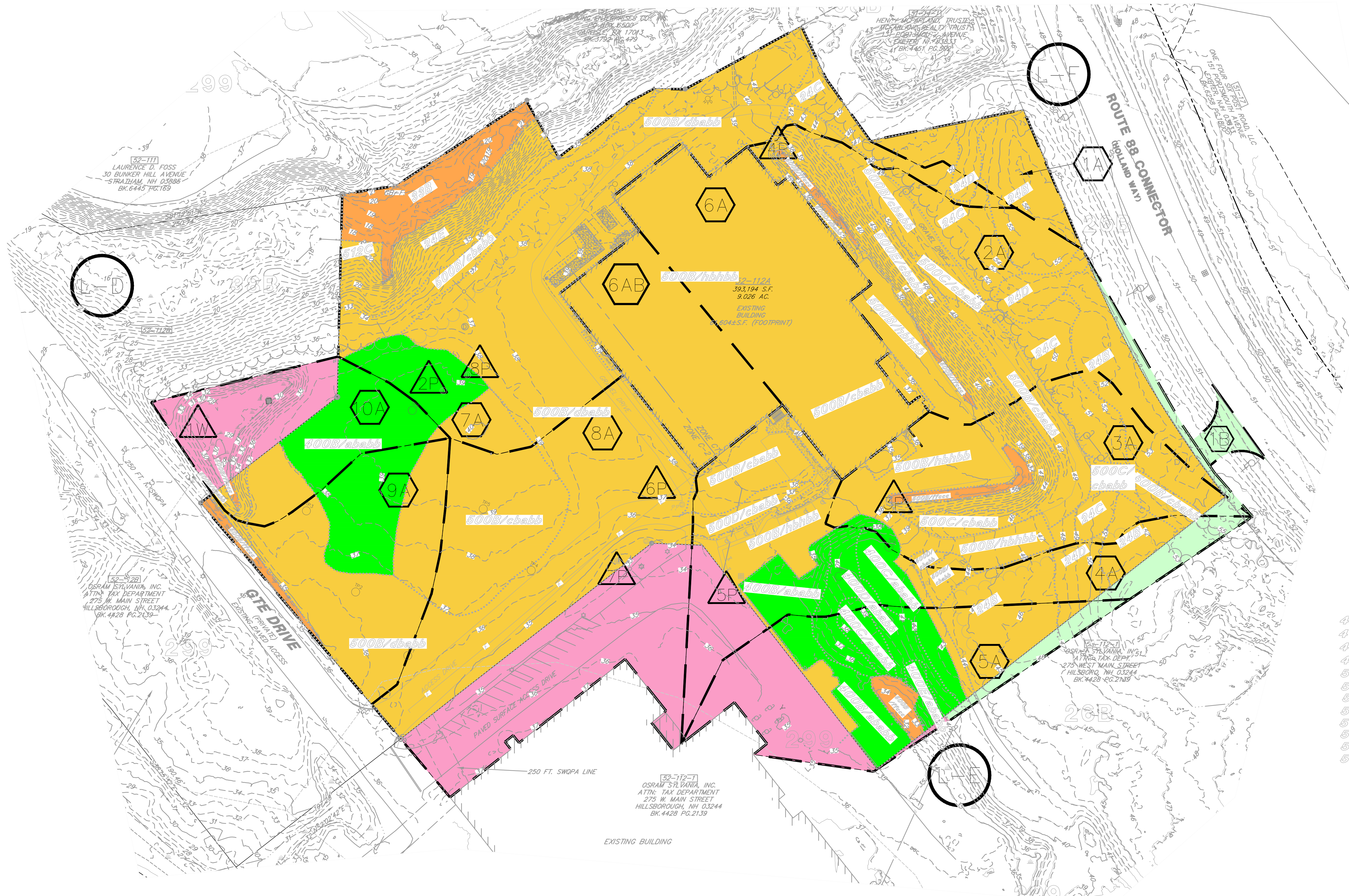
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REV	DATE	DESCRIPTION	DR	CK

<b>TFM</b>	Civil Engineers Structural Engineers Traffic Engineers Land Surveyors Landscape Architects Scientists	48 Constitution Drive Bedford, NH 03110 Phone (603) 472-4488 Fax (603) 472-9747 www.tfmoran.com
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**SITE DEVELOPMENT PLANS**

TAX MAP 52 LOT 112A

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