

**Burlington Conservation Board**

645 Pine Street  
Burlington, VT 05401  
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Telephone: (802) 865-7188

Zoe Richards, Chair  
Rebecca Roman  
Don Meals  
Miles Waite  
Ryan Crehan  
Hannah Brislin  
Caryn Connolly  
Kyle Tansley  
Leslie Spencer  
Elizabeth Cunningham, Student



# Conservation Board Meeting Public Notice

**Monday, August 5, 2024, 5:30 PM**

**311 North Avenue, Conference Room or Remote via Zoom**

Zoom: <https://zoom.us/j/95590052709?pwd=MlhQcTVTNmUydW5qeIBLeFUwZk9LZz09>

Webinar ID: 955 9005 2709

Password: 346560

Telephone: 1 929 205 6099

**1. Minutes**

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1.1. Accept minutes from July 1, 2024 meeting

**2. Board Comment**

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**3. Public Comment**

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**4. Project Review**

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4.1. ZP-24-256, 311 North Ave (RCO-RG; Ward 7) Farrell Properties / City of Burlington  
Proposed installation of recreation path, fencing, and associated stormwater improvements.

**5. Adjournment**

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**6. Informational and Non-Discrimination Statements**

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## **Conservation Board Meeting Minutes**

Monday, July 1st, 2024 – 5:30 pm

Remote Meeting

### **Attendance**

- Board Members: Zoe Richards (ZR), Miles Waite (MW), Hannah Brislin (HB), Caryn Connolly (CC), Rebecca Roman (RR), Leslie Spencer (LS), Kyle Tansley (KT), Ryan Crehan (RC)
- Absent: Don Meals (DM), Elizabeth Cunningham (EC)
- Public: Sharon Bushor, Missa Aloisi, Brett Brosseau, Ernie Pomerleau, Andres Torizzo
- Staff: Garret King (Permitting & Inspections) Megan Moir (Division Director of Water Resources)

ZR, chair, called the meeting to order at 5:33 p.m.

### **Annual Organizational Meeting**

Nomination and election of Chair:

Nomination- Rebecca Roman, Motion by CC and 2<sup>nd</sup> by MW

Election- Rebecca Roman Vote all yes

Nomination and election of Vice Chair:

Nomination- Caryn Connolly, Motion by MW and 2<sup>nd</sup> by RR

Election- Caryn Connolly Vote all yes

Nomination and election of Long Range Planning Committee representative

Nomination- Ryan Crehan, Motion RR and 2<sup>nd</sup> by ZR

Election- Ryan Crehan Vote all yes

### **Minutes**

June 3, 2024 minutes

Comments



MW: page 2 contamination, “if you can determine that there’s contamination associated with a former tank, there may be coverage up to 1 million” should be revised to “a former petroleum storage tank”

RR: Thank you, any other edits or changes? Can we get a motion?

A MOTION as amended was made by MW and SECONDED by RC:

Motion to approve the June 3 minutes as amended.

Vote: 8-0-0, motion carried

### **Board Comment**

MW: This will be my last meeting here as I have been appointed to the DRB and will have my first meeting there on the 16th, it has been great working with you all and it has been a good time. Now going to DRB I will still see all the same projects just further down the line.

ZR: Can we work to try and fill that spot you are leaving, and do you know of anyone that will be able to fill your spot and your expertise?

MW: I have a few in mind, and I will work to find someone and provide suggestions.

RC: I think that we as a board should take a look at our city wetland regulations due to changes at the federal level. Can we discuss the city’s wetland rules? I see some things that would be good to go over our rules to come up with recommendations.

RR and ZR: Sounds like a good idea, how should we go about this?

RC: We can have a discussion and then work to make it a reality. Scott may be able to help us facilitate this process.

ZR: I agree Scott will be the point person on this work.

RR: Any public comments?

### **Public Comment**

Sharon Bushor: First, congratulations Rebeca for your new appointment and thank you Zoe for your time as Chair. For Miles, are you looking at projects that are here today again when you move to the DRB at your first meeting? I know you are looking at finding a replacement but Paul Bierman is a professor in my ward, and I think his name is one that can be included in your consideration. Lastly thank you for looking further at our wetlands. If we look at our how we should also look at the state level and then compare how we align up against the state, I think typically we have better regulations than the state requires. Do we need to reconsider the regulations in the neighborhood code and how we missed protection for mature trees? We should look at how we should have things in place to prevent removing trees or getting permits to

remove trees. Proposed projects have had tree removal, and we should consider retaining trees. Thanks again all for all of your work. Stormwater is not always addressed, but mature trees play a part of this in our regulations. That is all I have to say on that. Thank you for all of your hard work.

ZR: This work should start to get covered in open space sub-committee work and discussions.

## **Project Review**

### **5.1 ZP-24-148, 49-55 Chase Street**

Applicants Missa Aloisi and Brett Brosseau appeared for this item

MW: Is this a full review or is this just a partial one?

GK: This is a full project review, both subdivision and development proposed.

Brett: Missa can present the overview for this project.

Missa: Current site overview shows that there are 3 existing buildings and there is space for additional development under the new zoning regulations. We are looking to densify in a reasonable manner. We are proposing a new subdivision and additional development to add to what is there. We are proposing two new 2-unit additions and then a new 4-unit building. Shared parking is also included. The Rumsey Lane building will be pulled closer to Rumsey than currently depicted as required by zoning. From meeting with neighbors, the biggest concerns we heard was about trees, we are trying to retain trees while removing smaller shrubs and brush, only removing the trees necessary to create the parking area. We are aware of the birds and aim to keep screening for the neighbors. We are also required to include 3 additional shade trees around the parking area that are not depicted in these drawings.

MW: Do you have an engineer plan for this project and are you working on the stormwater management aspect for this project?

Brett: Yes, we are currently working on that stormwater plan and are expecting to have that information ready for DRB

MW: Please in the future bring the stormwater management documents to us so that we can see and review this project with better understanding. Do we have drawings of elevations or how stormwater might flow on the property?

Missa: Our site is currently quite flat, and the site never has standing water. We have never witnessed runoff flowing into neighboring properties even during the largest storms. The soil and site seems to be a capture area.

CC: There may be a groundwater issue, and where is this water draining to, and flooding into the basement. Have you considered how to address this?

Missa: No basement is proposed, and we are proposing a stone drip-edge to catch additional water. We are intending to keep everything on site. We are currently working with engineers to

create a detailed site plan to show this. We have seen that our property is the low spot and is the capture area. We are also thinking about some grass swales if needed or cisterns if the engineers would recommend it.

MW: You have good partners, but I expect you will have to have some sort of detention basins to manage the water for the project.

Missa: We have a large parking lot already, and overall we are not changing impervious surface amounts by a large margin.

RC: Have you altered your plan from hearing comments from the neighbors about trees?

Missa: Yes, we have some additional landscaping, and we are also including 3 new trees for the parking area. We are only removing 5 leaning box elders but will be adding 3 new trees.

ZR: Do we want to move forward with this application as we see currently, or do we want to see a full stormwater plan before moving this forward?

MW: I do not think that we should allow this project to proceed, as we do not see a full stormwater plan. We have not done this in the past, and I do not see why we should make an exception. I think that we should ask the applicants to come back.

RR: Garret can you remind me to why this application was sent to Conservation board?

GK: This was sent to conservation board because it qualifies for Major Impact review, creating 5 or more units in a RL district.

RR: Thank you.

MW: Also in the packet, there is a public comment that had noted a bunch of things that the application is missing.

Brett: Garret, why was I not alerted to this document from the neighbor?

Garret: This was a public comment that was submitted today, around noon, and was uploaded as a comment for the board in line with standard practice. You can view them in the packet.

ZR: This is standard for us. We get a public comment by email, and we just attach it to the packet.

Brett: Yeah that's fine, I just didn't get a notification that would have alerted me to that.

MW: Can we put that item on screen?

Brett: Is there a summary for these items? We have already had a meeting with the neighbors, and we are the first in this process. As you can imagine, this process has not been smooth. So in all fairness, these types of responses are great, but for us already being behind I can't go through this right now. Can anyone summarize this so I can give feedback?

ZR: I would not say you need to go through this. It is just a public comment no different as if someone came here and was just speaking it.

CC: I would like to say in the past when we had projects, they usually do have a lot more detail about drainage and what type of plantings with species planted and things like that. It seems like your package is missing a lot of details we usually have when we make recommendations on projects.

Brett: Okay, here is the thing, when we went into this project we thought this was going to be a much shorter project. Without getting specific, things have changed rapidly, and coming into this meeting we were understanding where we were with stormwater and wastewater. We had no idea what the conservation committee was. We just learned of this last week. Kind of understanding we need a stormwater and wastewater plan and hustled under the impression that we would get here and go through these meetings and the DRB along with the approval process contingent on the stormwater plans getting reviewed. So that is the context of how we came into this.

Missa: I also want to note that if these were three separate properties the conservation board would not have gotten triggered. And I could have made a stormwater plan myself. We are trying to get these through in a way that would get us to meet our deadlines. We are now following the process as things are included all at once. If we spread this out then we would have never had to be here at this meeting. Now delaying this process will delay the next meeting and our construction process. We are on the learning curve here and are trying to do well and capture everything, but if these were individual we wouldn't even be here. Why do we have to have this level of review and get punished for doing this all at once? We may be able to get you the plans by next week.

RR: It sound like it has been a frustrating, maybe confusing, process. We see people here for comment. We have Megan Moir here that may want to comment on this project.

Megan Moir: Because you are changing surface coverage and water connections, this is confusing. Please reach out to me tomorrow as well. We are seeing new things, and if you reach out to me we can work this out. This is something new, so if we work on this in person, then it may be best.

RR: Any further questions or comment?

RR: Neighbors are concerned about trees and tree cover. You have three trees for shade but the current drawings do not show these shade trees by the parking lot. One is quite small and wouldn't provide shade. You have space and could provide more trees.

Missa: Yes, these are items that we are aware of, and we have this in our plan, but it is not in this current drawings that you have today.

RR: You may want to even go beyond this and add additional trees.

Missa: We have two on the north and one on the south but are also limited by snow. More trees might not be possible.

MW: Have you thought about plans for runoff and erosion mitigation during construction? Erosion prevention and sediment control measure are not evident.

Missa: I typically do these plans with all of the necessary information and will follow the guidelines, but for this project we are waiting on the engineers.

RR: It seems like there is more that we would like to review for this development. And just for the applicants' context, we are usually looking at stormwater and landscaping plans and native plants as well as everything environmentally focused, as the name conservation board implies. So without the plans, lots more questions are coming up.

Missa: I was not told this information. These items were not listed on the last list I was given, and that these things would be needed for review. I would have included all of this information if I was told. I feel that staff has not communicated these requirements, and we were not provided a detailed list by staff. I think we could have had all this laid out if we were given the whole list with all of these requirements by staff, but this was not done. I could have shown how we have a silt fence and swales, and stone drip catches. Now that I wasn't told, we are going to be delayed.

ZR: I feel that we would have not been able to review this unless we had all the information including stormwater plans. Just the landscaping plans alone would have not worked. I understand that you could have provided some of them, but it sounds like you were not in a place to provide all of them.

RR; we understand you are frustrated.

Brett: Not just frustrated, but actually we are spending money and this is wicked frustrating because we took over that property as a complete dump with dead animals and drug dealers. Things like this make managing properties very frustrating as we could have left it and got tenants anyway. This is very frustrating as we are willing to do whatever it takes, but the information is not coming to us. We can do any process. Us having to figure this out on our own creates additional cost, and we could just leave it if it becomes too difficult as we will still get rents. We don't want to do that as that is not how we like to manage our properties, but this type of activity will force us to. So whatever we have to do for next meeting I would like Garret to make sure we have exactly what we need so I don't feel like we are wasting our time because we are paying to be here.

RR: It sounds like you are in a position to get lots of help so we will make a motion.

MW: I think that we should motion to revisit this application.

A MOTION was made by CC and SECONDED by ZR:

-Come back to the next meeting with all necessary plan planting/landscaping, erosion, stormwater plans, and wastewater. We recommend more native plants and trees.

-LS: Friendly amendment, better and additional shade trees.

Vote: 8-0-0, motion carried.

## 5.2 ZP-24-263, 1074 Pine Street

Applicants Ernie Pomerleau, Andres Torizzo appeared for this item.

Ernie Pomerleau: We have been working on this for a long time and are the owners. We are working with the city, and state, 8 years in the making along with regional planning and our neighbors Champlain Housing. We are working on combining our lands so that we can do this project. This in an impaired waterway of Potash Brook. We have had incredible cooperation and are now shovel ready.

Megan Moir: This is in an impaired watershed area that is identified by the state based on TMDLs. It has been studied to get a new flow regime to support macroinvertebrates, which are the bugs that live under rocks that then support fish. This urban stream may be able to meet the requirements of a class-B waterway after this project. The regulations requires us to manage flow, mainly the highs and lows, some streams dry up and others wash out. The city is required to develop a flow restoration plans. Plan for this project and the city is working with South Burlington on this project for flow restoration. The state has established a 3-acre requirement for projects. This Pomerleau project is working with grants and we are working to have the best process that we can. This project is more unique as it will be a gravel wetland. This type of project will be best to remove phosphorus. While the city does not have land in this project we are collaborating with CHT and Pomerleau to pull state funds. We are working though the city to give us a grant that will be a total of 2 million dollars of ARPA funds for this project. The environmental bonus will be much greater than any potential impact.

Andres Torizzo: This is essentially a proposed gravel wetland designed to manage the whole shopping center area and half the CHT impervious. We are working with a large scale project that manages runoff coming from impervious surface that gets lots of use, meaning high levels of contamination. The existing area is highly degraded, and we have gone through the Army Corps of Engineers for some of this work. Everything existing is so heavily degraded that any work we do will likely be an improvement. We do have a new outlet pipe that is in the bank of Potash Brook and replaces the current pipe. This will be our disturbance to the brook, and we have an erosion control plan that we have provided. We are putting in a stone that is interlinking and a stabilization plan with vegetation designed as a wetland seed mix. A new path is also going through the area, and we are attempting to work with them in this process. The review is mostly the new outfall pipe.

MW: Are there any underdrain plans where you can get some of this stormwater back underground, or is the stormwater just going through the proposed system.

Andres: We did some soil work and the conditions were found to be heavy soils and are not good for drainage or absorption. We think it is best to just treat the stormwater as proposed.

Megan: In order to treat the water, it is required to sit. We were told that is it best to have the infiltration and has to comply with the flow restoration plan. Base flow was of less concern, more focus was controlling the peak flow.

MW: Currently work is underway. Will this new wetland be visible from this new path?

Andreas. Yes, all this work and the new wetland will be visible.

ZR: Can we have any sign or information to tell the story of this project so that the public is able to know what this work is being done and how great of a win this project is?

Andres: Yes, that sounds like a good idea. We will take a look to see what we can do.

RC: What is the wetland seed mix?

Andres: It is planned to be a native seed mix and is from Vermont wetland supply that we are hoping to buy, but I do not have the exact details today.

RR: Any further comments, hearing none, we need a motion.

A MOTION was made by MW and was SECONDED by ZR:

- Motion to approve as presented.

Vote: 8-0-0, motion approved.

### **Open Space Subcommittee**

No meeting today.

### **Update & Discussion**

Review of draft letter to the Mayor as to shoreline naturalization in the urban Reserve.

RR: We talked about the urban reserve and collaboration with the city to make a full management project for the urban reserve. We wanted to write a letter to the Mayor to do a project in the urban reserve but not the entire urban reserve. The easement does not mention the management plan as a requirement. It may just be a VHC policy.

RC: We have looked at the shoreline and naturalization part of the urban reserve. We talked with Cindi at Parks, the Parks Commission and planners, CEDO and the Mayor's office so that we can all work together in this process. There is no guarantee of a fast track, but we made progress.

RR: Any further questions, hearing none we can adjourn.

ZR motion to adjourn MW 2nd

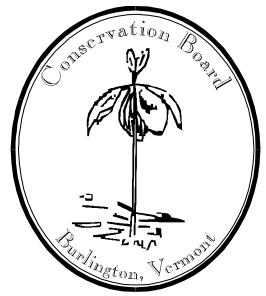
### **Adjournment**

7:00pm.

## Burlington Conservation Board

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## Conservation Board Meeting Minutes

Monday, August 5, 2024 – 5:30 pm

Remote & In Person Meeting

### Attendance

- **Board Members:** Zoe Richards (ZR), Caryn Connolly (CC), Rebecca Roman (RR), Leslie Spencer (LS), Kyle Tansley (KT), Elizabeth Cunningham (EC)
- **Absent:** Hannah Brislin (HB), Don Meals (DM), Ryan Crehan (RC)
- **Public:** Eric Farrell, Mike Buscher, Peter Smiar, Dave Marshall, Kristina \_\_\_\_ (311 North Ave)
- **Staff:** Scott Gustin (Permitting & Inspections), Dan Cahill, Daniel Schmidt, Sophie Sauve, Jon Adams-Kolitz, Max Maladanski, Cindi Wight (Parks & Rec)

RR, chair, called the meeting to order at 5:38 p.m.

### Minutes

July 1, 2024 minutes

A MOTION was made by CC and SECONDED by LS:

Approve the July 1 minutes as written.

Vote: 5-0-0, motion carried.

### Board Comment

SG noted that the second year of the Legacy Fund Grant is coming up. This will be an action item on the Board's September meeting agenda.

RR noted that VHCB is hosting a conservation conference on October 7.

### Public Comment

None.

### Open Space Subcommittee

No meeting today.

### Project Review

#### 1. ZP-24-256, 311 North Ave (RCO-RG; Ward 7) Farrell Properties / City of Burlington

Proposed installation of recreation path, fencing, and associated stormwater improvements.

The programs and services of the Dept. of Permitting & Inspections are accessible to people with disabilities. For accessibility information call 865-7188.



Eric Farrell, Mike Buscher, Peter Smiar, and Dave Marshall appeared for this item.

SG summarized the project, why it's before the Board, and noted the statutorily limited review due to the municipal ownership and operation of the property. The limited review does allow for landscaping and stormwater review, which is much of what the project consists of.

Eric Farrell overviewed the project. The conservation easement holder, VHCB, did a site visit recently and is aware of the project.

Mike Buscher presented the context and background for the project. There's an existing path part way down along Cambrian Way. By the end of this fall, it will be extended to the edge of the development property.

CC, will there be a perimeter fence around the development? Mike Buscher, no.

Mike Buscher, the existing rec path will extend into the proposed path through the city park. There will be another, fully ADA accessible path from the development to the waterfront path through the park on the north side of the development. The path route through the park has been an iterative process. There are steep sections at the northerly end where it connects to the waterfront bike path.

Mike Buscher reviewed the tree protection and proposed landscaping plans. Landscaping will reflect existing conditions with plantings for open meadow areas, wooded areas, and transitional areas. The tree protection plan calls out limits of disturbance and critical root zones. Areas of disturbance within the critical root zones will include root pruning. RR, how do you determine where to prune the roots? Mike Buscher, critical root areas are mapped. The city arborist will be involved decision making.

Mike Buscher, fairly intensive new planting is proposed. Several hundred new plantings are included in the landscaping plan. Black locusts are predominant at the northerly end. Oaks are more abundant south of that.

ZR, what are the big trees on the far north end? Mike Buscher, mostly box elder and one oak.

ZR, there are risks in having dead trees next to a public path. Overall, within the natural area, they are not out of place.

RR mentioned the landscaping suggestions provided by Kate Kruesi. Mike Buscher said the civil plans included boilerplate language. Correct species will be specified on the landscape plans. We will collaborate with Parks as to the remainder of the suggestions.

Kristina \_\_\_\_, what the surface of the path? Mike Buscher, it will be asphalt. The southerly extent of the existing path is natural surface. RR, does the easement stipulate surface type? Dan Cahill, we would have to change the easement provisions in order to change the surface.

ZR, will Parks need to approve the final species mix? Mike Buscher, yes.

ZR, what's happening to the existing path? Mike Buscher, the plan is to close it off and add barriers to allow for establishment of new vegetation.

Peter Smiar overviewed the stormwater management. He noted upstream stormwater infrastructure within the Cambrian Rise development. The existing conditions on the subject property are woods and meadow on sandy soils. There's not a lot of stormwater runoff, except in larger storm events. There is some localized erosion on the bluff due to the existing unmaintained path. There are two stormwater management goals: Treat the runoff from the path itself. The other is to treat runoff from the larger site during larger storm events. Runoff from the path will flow into parallel swales for infiltration. Pre-treatment channels and dry swales will work together in the proposed system. The first 1" of runoff will be captured and infiltrated. Anything more than that will flow into a pipe and be conveyed out to the lake.

Dan Cahill asked if the proposed infrastructure will be an improvement over existing conditions. Peter Smiar, yes, it will be much better.

ZR, what do the swales look like? Peter Smiar, they are about 2' wide. Plantings within them can vary. They are "dry" and won't hold water long term.

Daniel Schmidt, does the conveyance need to go to the lake? Peter Smiar noted the water quality vs. water quantity standards. Water quality is always treated first. Once treatment is provided, then just excess water volume discharges from them.

Daniel Schmidt noted that the stone dust path shoulders may experience erosion similar to those along the waterfront bike path.

LS asked about ongoing maintenance. Peter Smiar noted the annual maintenance, reporting, and certification requirements.

RR, clarify the treatment standard? Peter Smiar, this system is geared towards a 2" storm event (basically 2X the state standard).

Kristina \_\_\_\_, the existing path is steep and eroded. Is there a way to prevent additional runoff from this feature? Mike Buscher said there was discussion of installing a staircase here. Dan Cahill said its not in this proposal but remains something that Parks may do.

Dan Cahill commented this has been a significant journey over the years. Given the site challenges, the version of the plan we're working with now is close to the best it can be. Thanks to everyone who has helped make this happen.

Eric Farrell said that the proposed work will better protect the lake than current conditions.

LS, what's the timeline for this proposal? Eric Farrell, we're supposed to build it this year.

ZR said she's excited that this work will include ADA accessibility.

A MOTION was made by ZR and SECONDED by LS:

Approve the plans as presented with the note that we encourage Parks to make note of the seed suggestions by Kate Kruesi.

Vote: 5-0-0, motion carried.

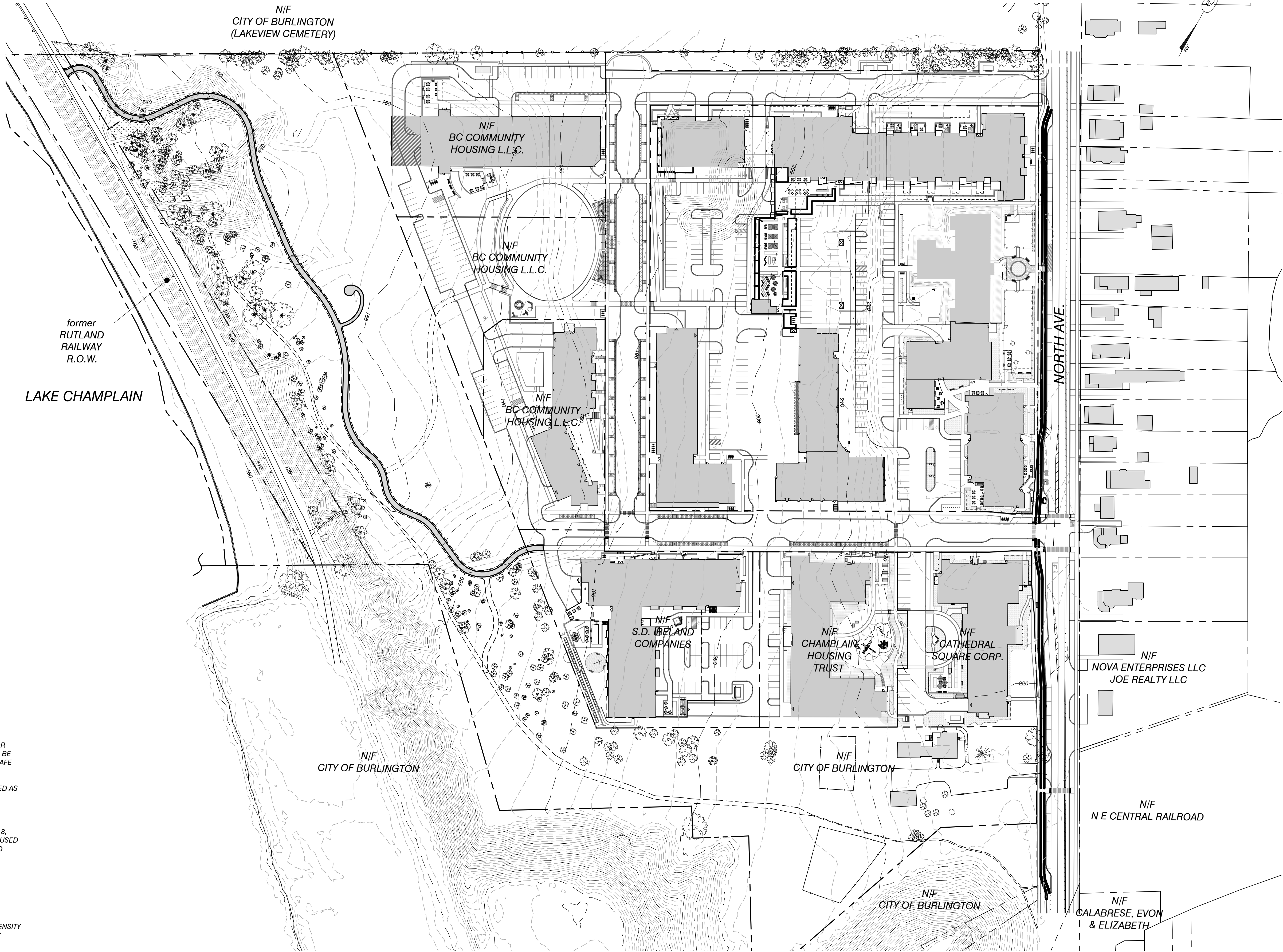
### **Adjournment**

6:31 PM.



LEGEND

- APPROXIMATE PROPERTY LINE  
APPROXIMATE SETBACK LINE  
100  
EXISTING CONTOUR  
EXISTING CURB  
EXISTING CHAINLINK FENCE  
EXISTING WIRE FENCE  
EXISTING GRAVEL  
EXISTING PAVEMENT  
EXISTING GUARD RAIL  
EXISTING ELECTRIC  
EXISTING FORCEMAIN  
EXISTING GAS  
EXISTING STORM  
EXISTING GRAVITY SEWER  
EXISTING TELEPHONE  
EXISTING WATER  
EXISTING SWALE  
EXISTING SEWER MANHOLE  
EXISTING STORM MANHOLE  
EXISTING CATCH BASIN  
EXISTING WELL  
EXISTING HYDRANT  
EXISTING SHUT OFF  
EXISTING UTILITY POLE  
EXISTING LIGHT POLE  
EXISTING GUY WIRE/POLE  
EXISTING SIGN  
EXISTING DECIDUOUS TREE  
EXISTING CONIFEROUS TREE  
EDGE OF BRUSH/WOODS  
IRON ROD/PIPE FOUND  
CONCRETE MONUMENT FOUND  
RAILROAD RAIL FOUND  
TEST PIT  
PROJECT BENCHMARK



NOTES

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DRAWN

SAL

CHECKED

DSM

APPROVED

DSM

CLIENT:

**BURLINGTON PARKS,  
RECREATION &  
WATERFRONT**

645 PINE ST., SUITE B  
BURLINGTON, VERMONT  
05401

PROJECT:

**311 NORTH AVE.  
MULTI-USE PATH**

311 NORTH AVE.  
BURLINGTON, VT



LOCATION MAP

1" = 2000'

| DATE    | CHECKED | REVISION                |
|---------|---------|-------------------------|
| 7/19/24 | DSM     | PERMIT REVIEW SUBMITTAL |
|         |         |                         |
|         |         |                         |
|         |         |                         |
|         |         |                         |
|         |         |                         |
|         |         |                         |
|         |         |                         |

**OVERALL SITE PLAN**

DATE

JUL., 2024

SCALE

1" = 80'

PROJ. NO.

18118

DRAWING NUMBER

**C1.0**

GRAPHIC SCALE







SITE ENGINEER:  
  
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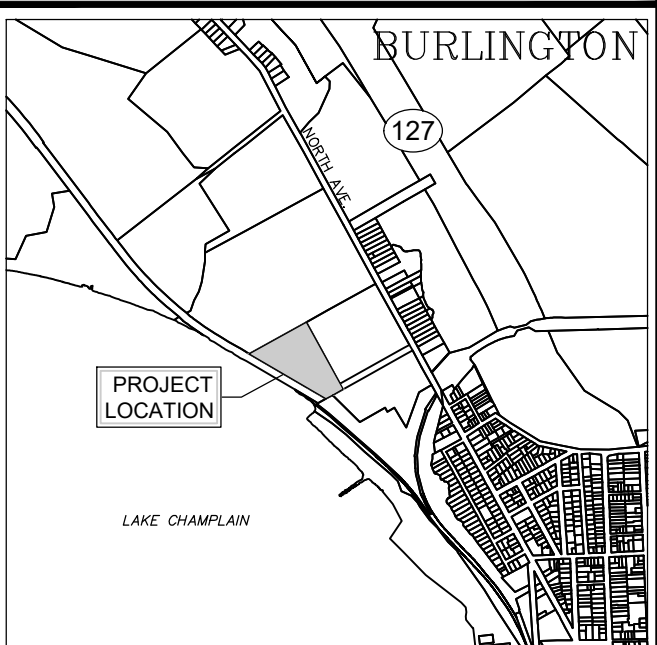
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CLIENT:  
**BURLINGTON PARKS,  
RECREATION &  
WATERFRONT**  
645 PINE ST., SUITE B  
BURLINGTON, VERMONT  
05401

PROJECT:  
**311 NORTH AVE.  
MULTI-USE PATH**  
311 NORTH AVE.  
BURLINGTON, VT

  
LOCATION MAP  
1" = 2000'

| DATE    | CHECKED | REVISION                |
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EXISTING  
CONDITIONS  
SITE PLAN

DATE  
JUL., 2024

SCALE  
1" = 40'

PROJ. NO.  
18118

DRAWING NUMBER  
**C1.1**





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| APPROVED<br>DSM |  |

CLIENT:

**BURLINGTON PARKS,  
RECREATION &  
WATERFRONT**  
645 PINE ST., SUITE B  
BURLINGTON, VERMONT  
05401

PROJECT:

**311 NORTH AVE.  
MULTI-USE PATH**  
311 NORTH AVE.  
BURLINGTON, VT

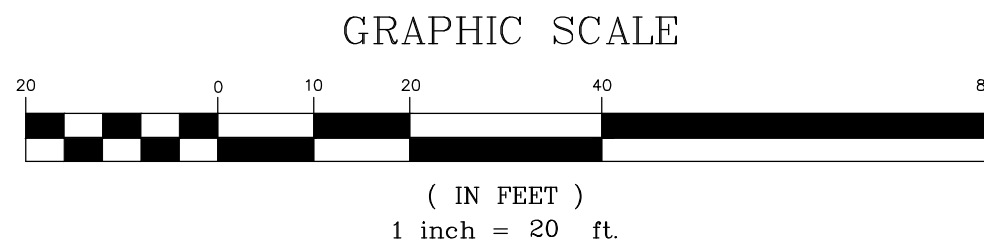


LOCATION MAP  
1" = 2000'

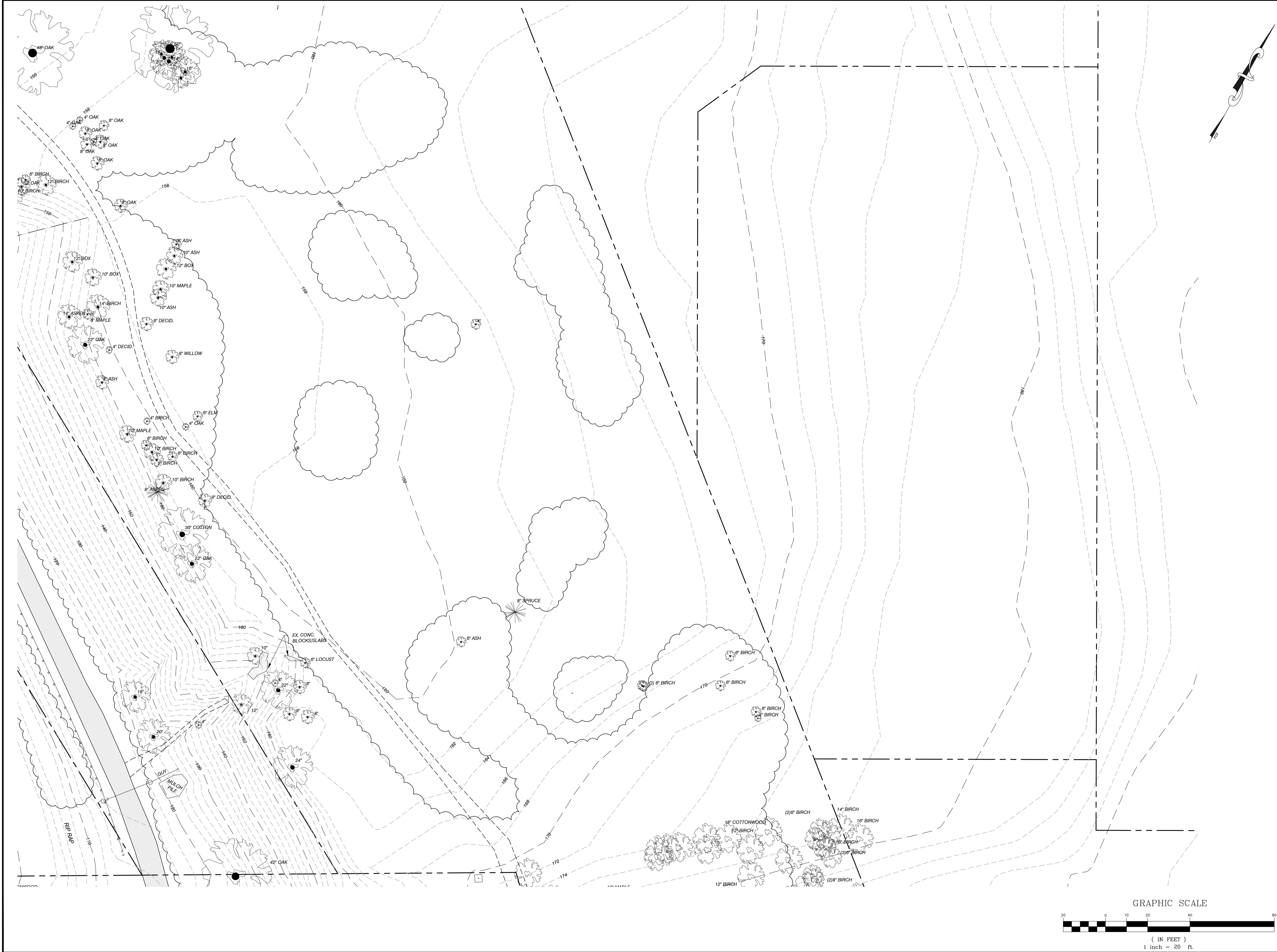
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**EXISTING  
CONDITIONS  
PARTIAL SITE PLAN**

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| DATE<br>JUL., 2024 | DRAWING NUMBER<br><b>C1.2</b> |
| SCALE<br>1" = 20'  |                               |
| PROJ. NO.<br>18118 |                               |







SITE ENGINEER:



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| APPROVED<br>DSM |  |

CLIENT:  
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RECREATION &  
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BURLINGTON, VERMONT  
05401

PROJECT:  
**311 NORTH AVE.  
MULTI-USE PATH**  
311 NORTH AVE.  
BURLINGTON, VT

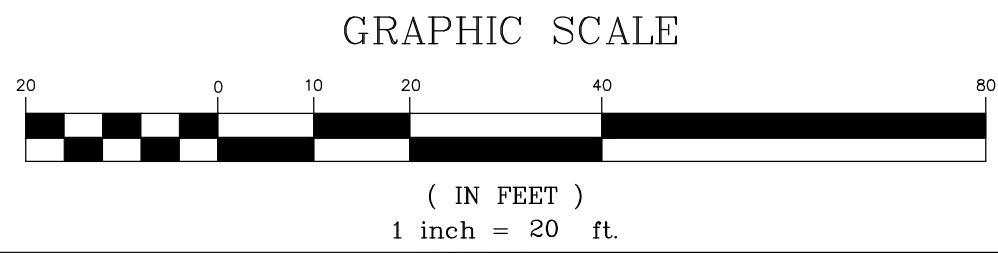


LOCATION MAP  
1" = 2000'

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**EXISTING  
CONDITIONS  
PARTIAL SITE PLAN**

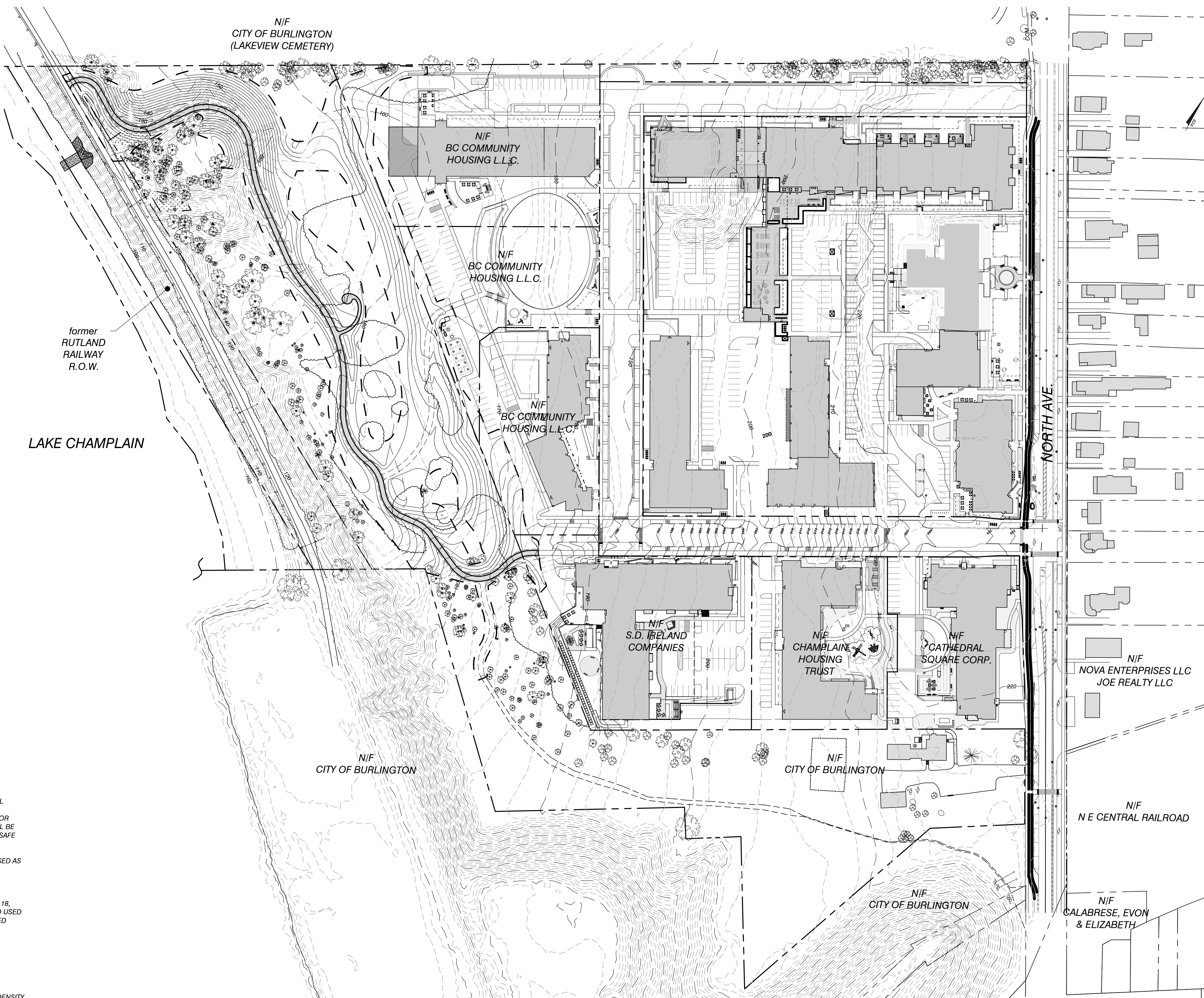
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| SCALE<br>1" = 20'  |                               |
| PROJ. NO.<br>18118 |                               |





LEGEND

- APPROXIMATE PROPERTY LINE  
APPROXIMATE SETBACK LINE  
-100- EXISTING CONTOUR  
EXISTING CURB  
EXISTING CHAINLINK FENCE  
EXISTING WIRE FENCE  
EXISTING GRAVEL  
EXISTING PAVEMENT  
EXISTING GUARD RAIL  
EXISTING ELECTRIC  
EXISTING FORCEMAIN  
EXISTING GAS  
ST EXISTING STORM  
S EXISTING GRAVITY SEWER  
T EXISTING TELEPHONE  
W EXISTING WATER  
EXISTING SWALE  
EXISTING SEWER MANHOLE  
EXISTING STORM MANHOLE  
EXISTING CATCH BASIN  
EXISTING WELL  
EXISTING HYDRANT  
EXISTING SHUT OFF  
EXISTING UTILITY POLE  
EXISTING LIGHT POLE  
EXISTING GUY WIRE/POLE  
EXISTING SIGN  
EXISTING DECIDUOUS TREE  
EXISTING CONIFEROUS TREE  
EDGE OF BRUSHWOODS  
IRON ROD/PIPE FOUND  
CONCRETE MONUMENT FOUND  
RAILROAD RAIL FOUND  
TEST PIT  
PROJECT BENCHMARK



NOTES

- UTILITIES SHOWN DO NOT PURPORT TO CONSTITUTE OR REPRESENT ALL UTILITIES LOCATED UPON OR ADJACENT TO THE SURVEYED PREMISES. EXISTING UTILITY LOCATIONS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CONFLICTS. ALL DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER. THE CONTRACTOR SHALL CONTACT DIG SAFE (888-344-7233) PRIOR TO ANY CONSTRUCTION.
- THIS PLAN IS NOT A BOUNDARY SURVEY AND IS NOT INTENDED TO BE USED AS ONE.
- PROPERTY LINE INFORMATION IS BASED PLAT ENTITLED "LOT LINE ADJUSTMENT BETWEEN 329 & 351 NORTH AVE BURLINGTON COLLEGE" PREPARED BY CIVIL ENGINEERING ASSOCIATES, INC. DATED DECEMBER 18, 2014. THIS PLAN IS NOT A BOUNDARY SURVEY AND IS NOT INTENDED TO BE USED AS ONE. MONUMENTATION RECOVERED IS CONSISTENT WITH RECORDED DOCUMENTS.
- SITE INFORMATION IS BASED ON A FIELD SURVEY PERFORMED BY CIVIL ENGINEERING ASSOCIATES, INC. DECEMBER 2014. CIVIL ENGINEERING ASSOCIATES, INC. SURVEY ORIENTATION IS "GRID NORTH", VERMONT COORDINATE SYSTEM OF 1983 (HORIZONTAL) AND NAVD88 (VERTICAL) ESTABLISHED FROM GPS OBSERVATIONS ON SITE.
- THIS PROPERTY LAYS WITHIN THE WATERFRONT RESIDENTIAL MEDIUM DENSITY ZONING DISTRICT AND THE NATURAL RESOURCES PROTECTION OVERLAY DISTRICT.

SITE ENGINEER:



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CLIENT:

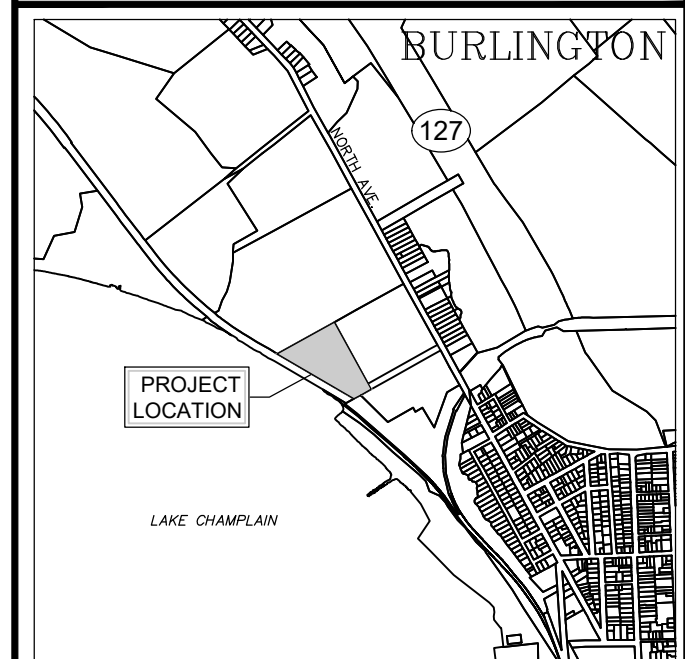
**BURLINGTON PARKS,  
RECREATION &  
WATERFRONT**

645 PINE ST., SUITE B  
BURLINGTON, VERMONT  
05401

PROJECT:

**311 NORTH AVE.  
MULTI-USE PATH**

311 NORTH AVE.  
BURLINGTON, VT



LOCATION MAP

1" = 2000'

| DATE    | CHECKED | REVISION                |
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| 7/19/24 | DSM     | PERMIT REVIEW SUBMITTAL |
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**PROPOSED  
CONDITIONS  
OVERALL SITE  
PLAN**

DATE  
JUL., 2024

SCALE  
1" = 80'

PROJ. NO.  
18118

DRAWING NUMBER

**C2.0**

GRAPHIC SCALE



( IN FEET )  
1 inch = 80 ft.

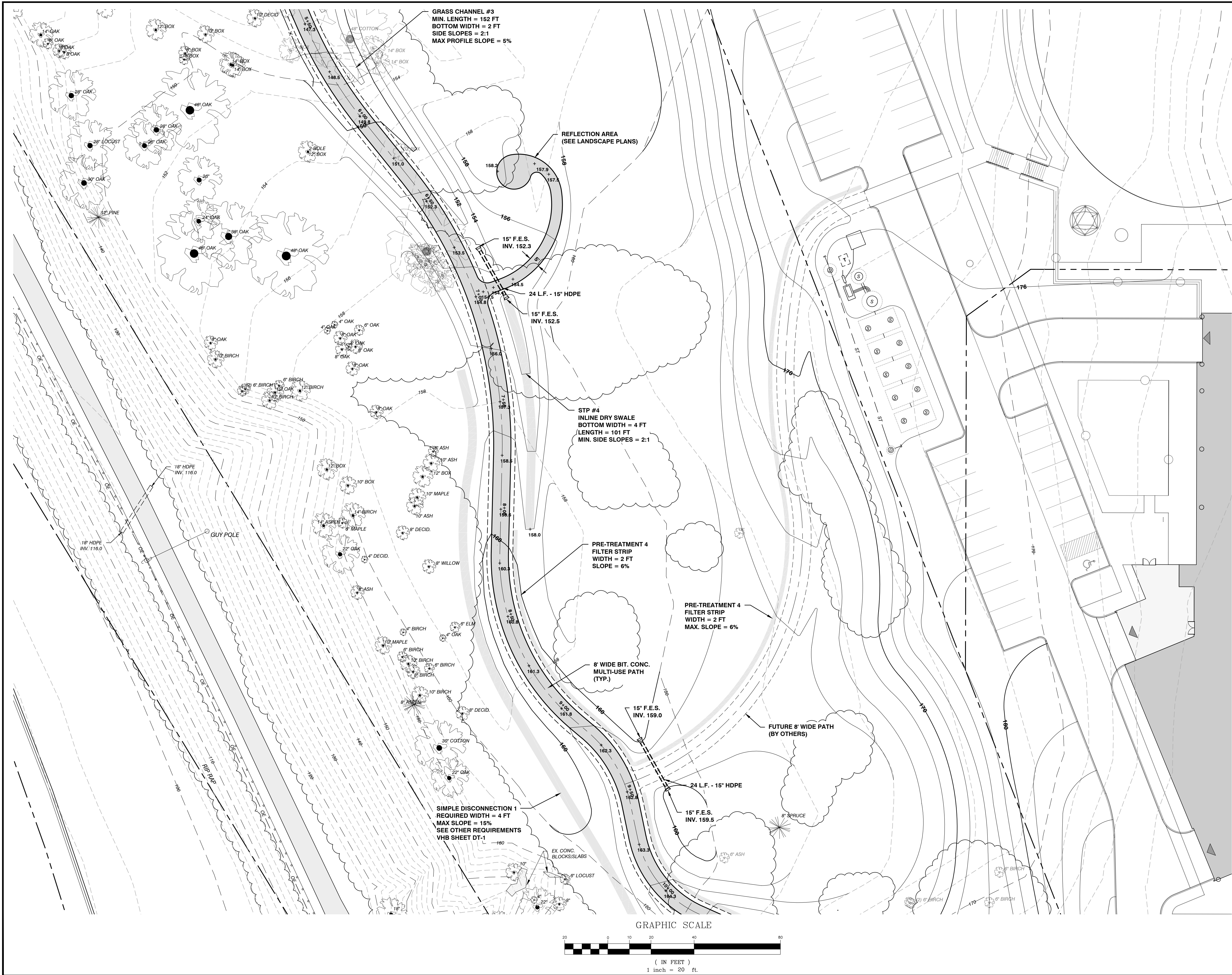












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DSM

CLIENT:

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RECREATION &  
WATERFRONT**

645 PINE ST., SUITE B  
BURLINGTON, VERMONT  
05401

PROJECT:

**311 NORTH AVE.  
MULTI-USE PATH**

311 NORTH AVE.  
BURLINGTON, VT



LOCATION MAP

1" = 2000'

| DATE    | CHECKED | REVISION                |
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| 7/19/24 | DSM     | PERMIT REVIEW SUBMITTAL |
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**PROPOSED  
CONDITIONS  
PARTIAL SITE PLAN**

DATE

JUL., 2024

SCALE

1" = 20'

PROJ. NO.

18118

DRAWING NUMBER

**C2.3**

GRAPHIC SCALE



( IN FEET )

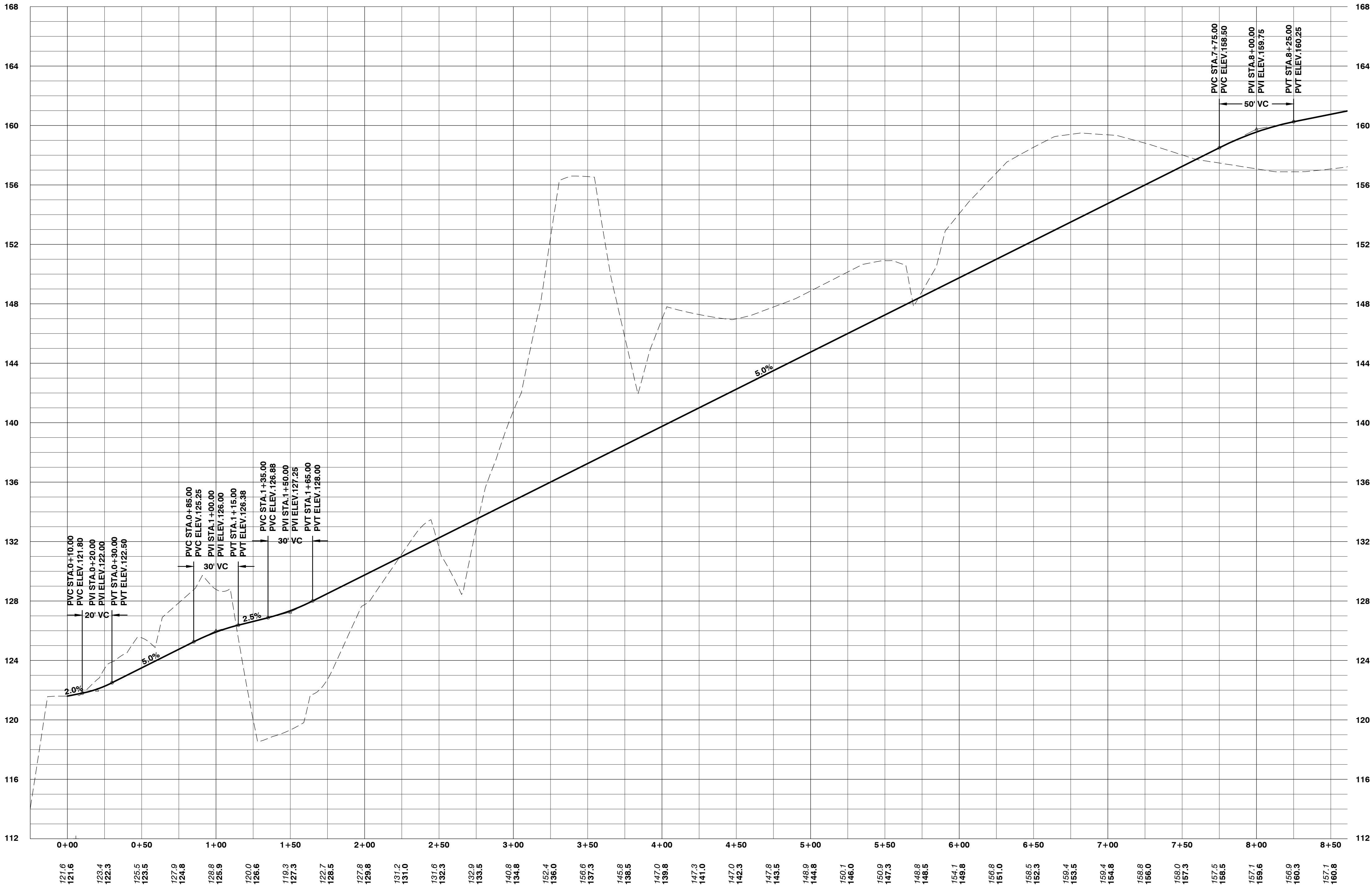
1 inch = 20 ft.





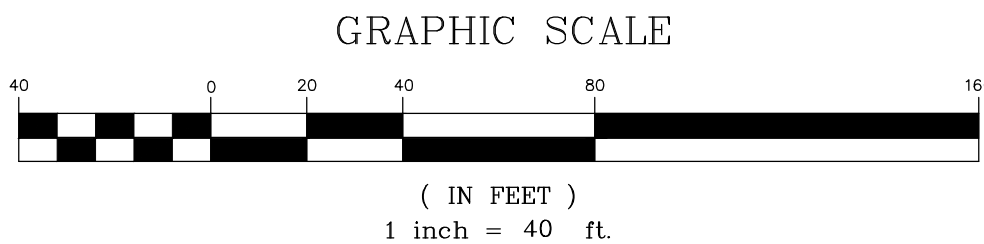


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PATH PROFILE

HORIZ.: 1"=40'  
VERT.: 1"=4'



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RECREATION &  
WATERFRONT**  
645 PINE ST., SUITE B  
BURLINGTON, VERMONT  
05401

PROJECT:

**311 NORTH AVE.  
MULTI-USE PATH**  
311 NORTH AVE.  
BURLINGTON, VT



LOCATION MAP

1" = 2000'

| DATE    | CHECKED | REVISION                |
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| 7/19/24 | DSM     | PERMIT REVIEW SUBMITTAL |
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PROFILE

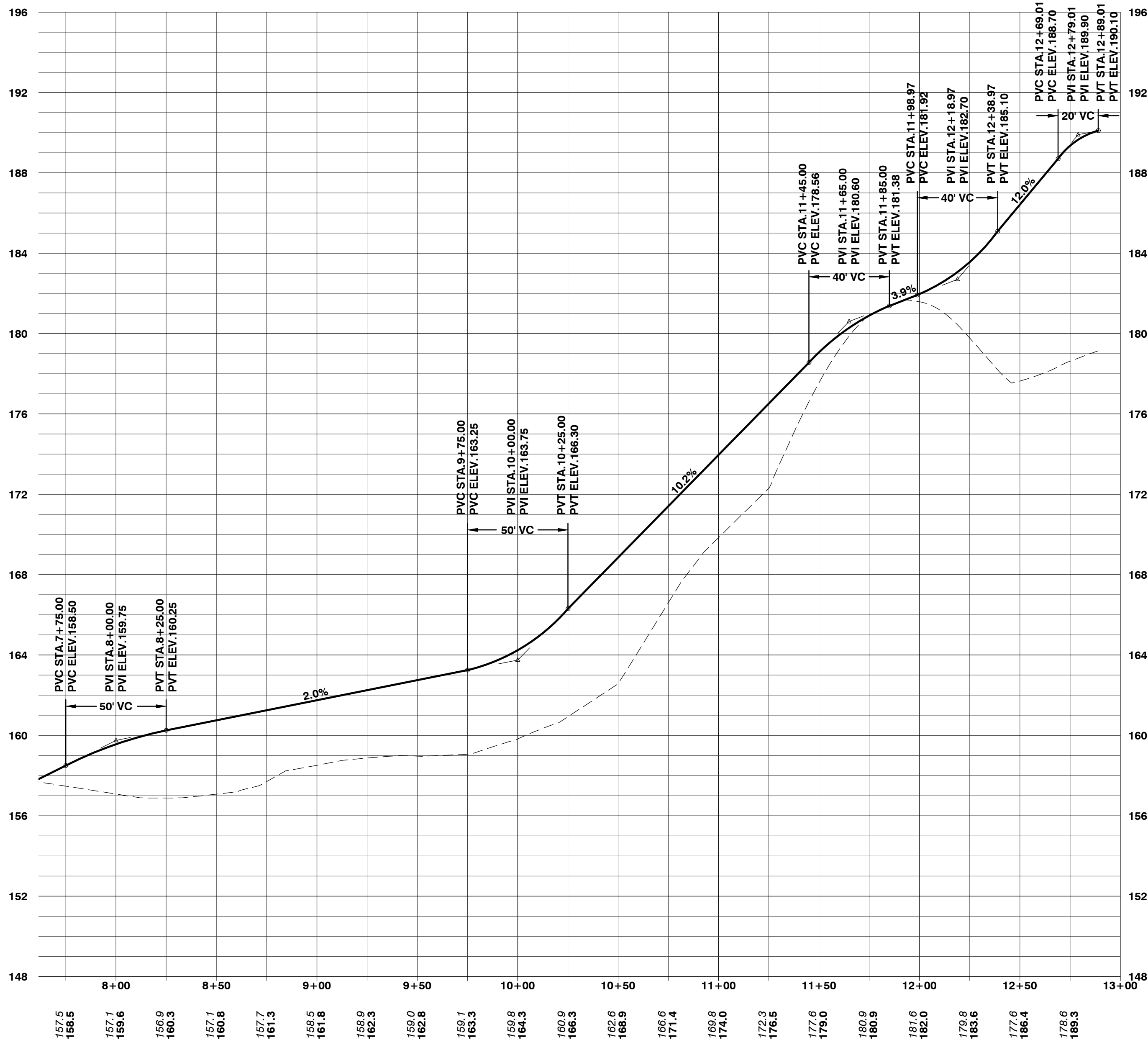
DATE  
JUL., 2024  
SCALE  
1" = 40'  
PROJ. NO.  
18118

DRAWING NUMBER

C2.5

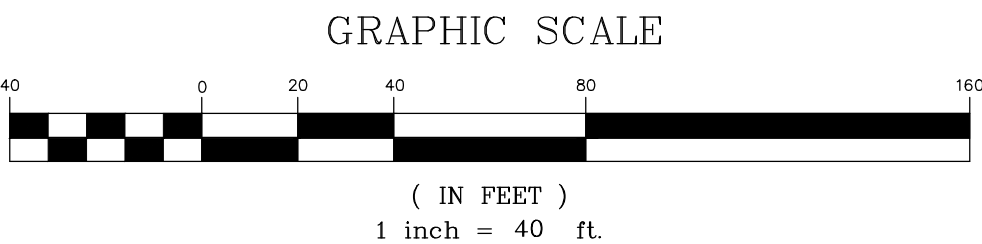


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PATH PROFILE (CONT.)

HORIZ.: 1"=40'  
VERT.: 1"=4'



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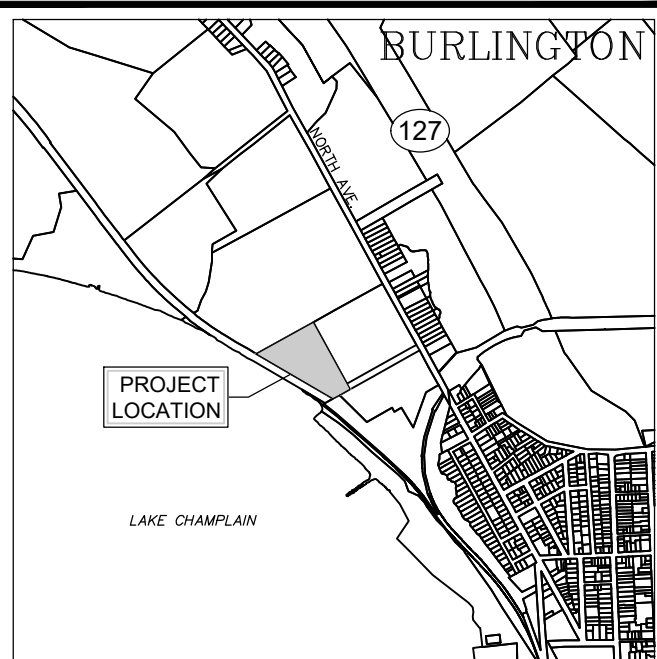
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CLIENT:

BURLINGTON PARKS,  
RECREATION &  
WATERFRONT  
645 PINE ST., SUITE B  
BURLINGTON, VERMONT  
05401

PROJECT:

311 NORTH AVE.  
MULTI-USE PATH  
311 NORTH AVE.  
BURLINGTON, VT



LOCATION MAP

1" = 2000'

| DATE    | CHECKED | REVISION                |
|---------|---------|-------------------------|
| 7/19/24 | DSM     | PERMIT REVIEW SUBMITTAL |
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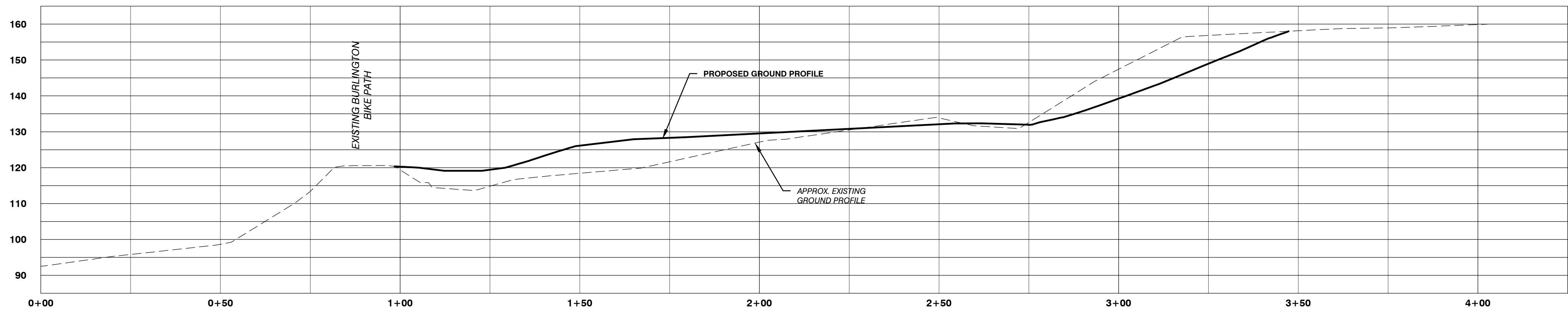
PROFILE (CONT.)

DATE  
JUL., 2024  
SCALE  
1" = 40'  
PROJ. NO.  
18118

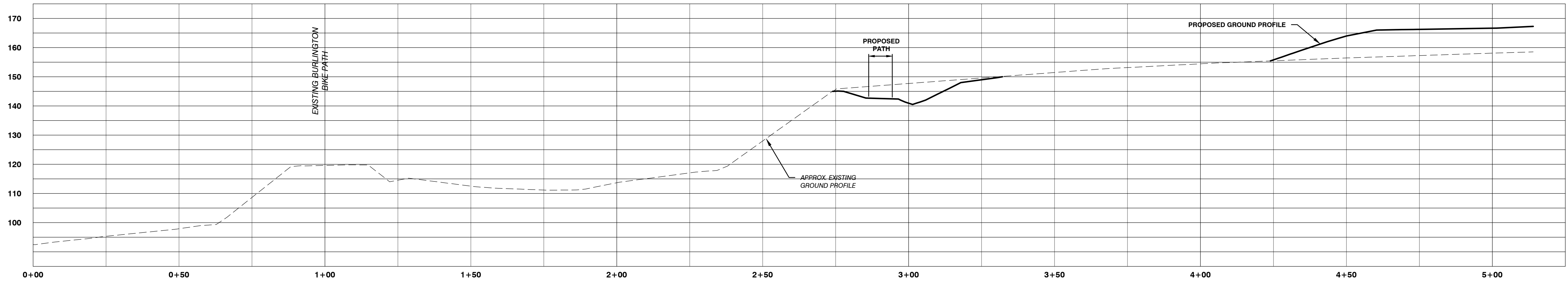
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C2.6

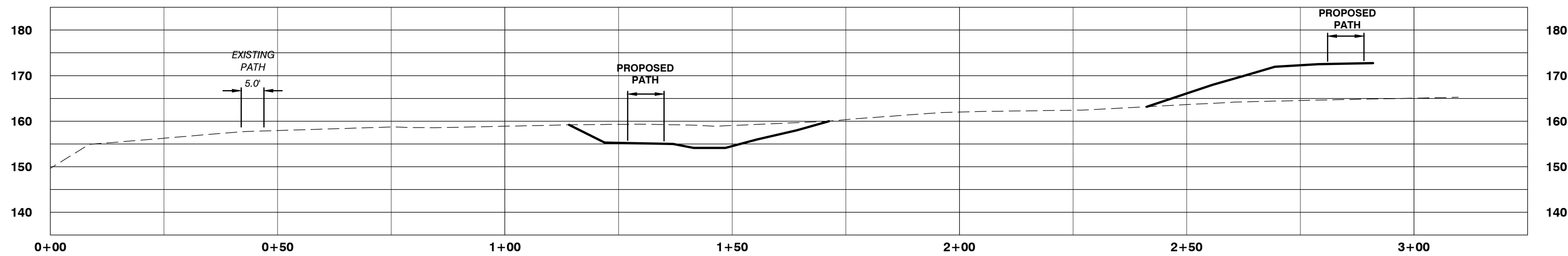




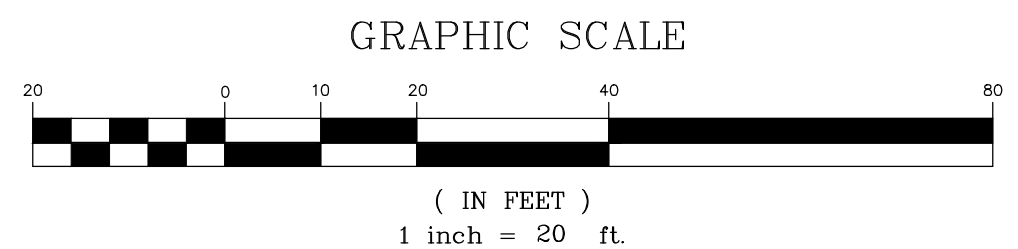
SECTION 'A'  
SCALE: 1"=20'



SECTION 'B'  
SCALE: 1"=20'



SECTION 'C'  
SCALE: 1"=20'



SITE ENGINEER:



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BURLINGTON, VERMONT  
05401

PROJECT:

**311 NORTH AVE.  
MULTI-USE PATH**

311 NORTH AVE.  
BURLINGTON, VT



LOCATION MAP

| DATE    | CHECKED | REVISION                   |
|---------|---------|----------------------------|
| 2/10/21 | DSM     | ADDED SECTION C - OPTION 2 |
| 7/19/24 | DSM     | PERMIT REVIEW SUBMITTAL    |
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SECTIONS

DATE  
JUL., 2024

SCALE  
1" = 20'

PROJ. NO.  
18118

DRAWING NUMBER

**C2.7**

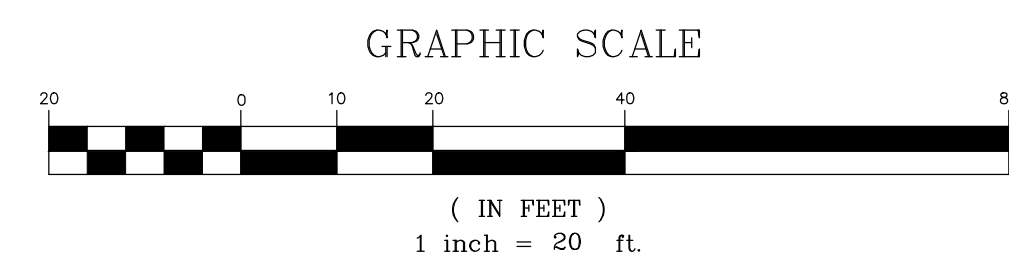
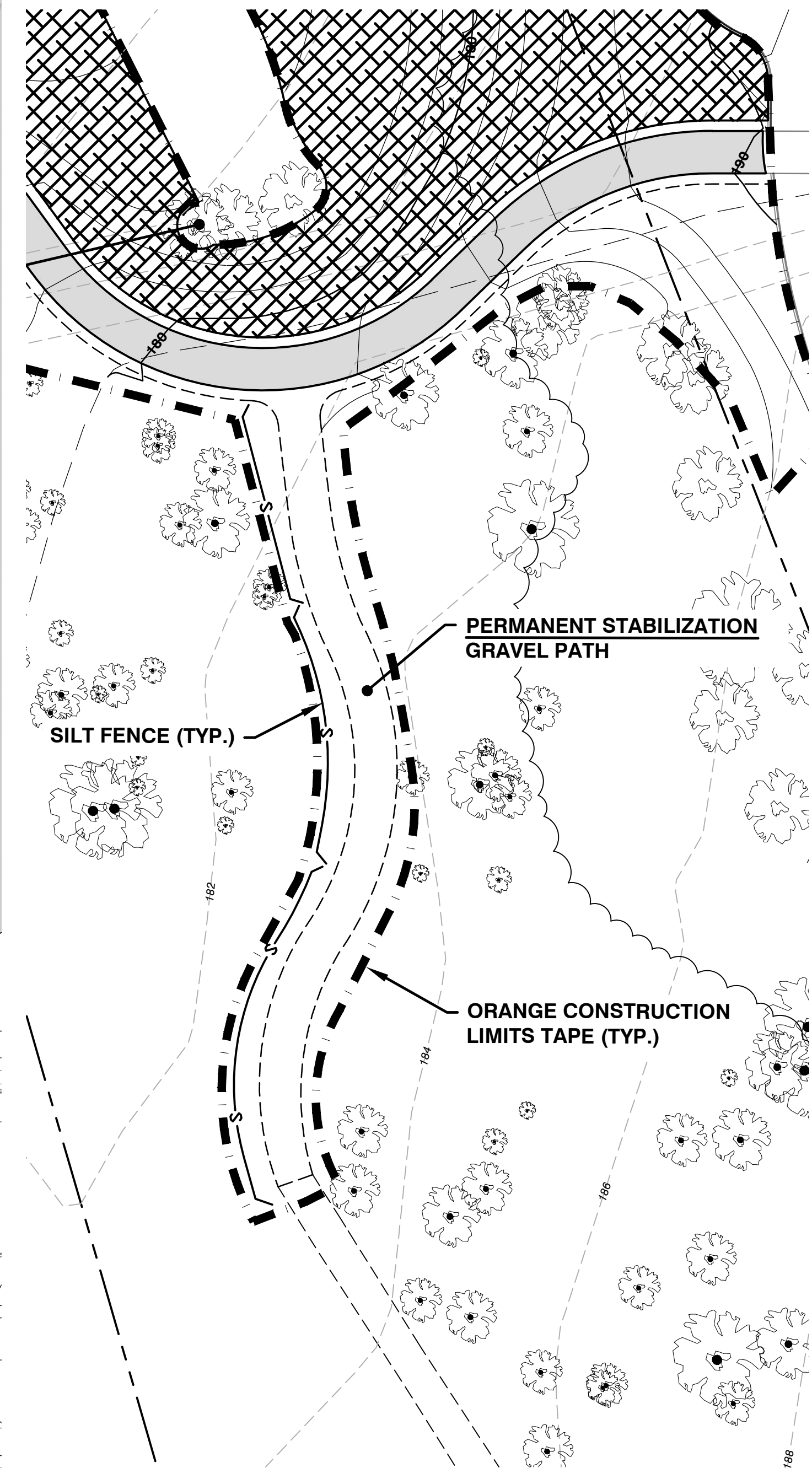
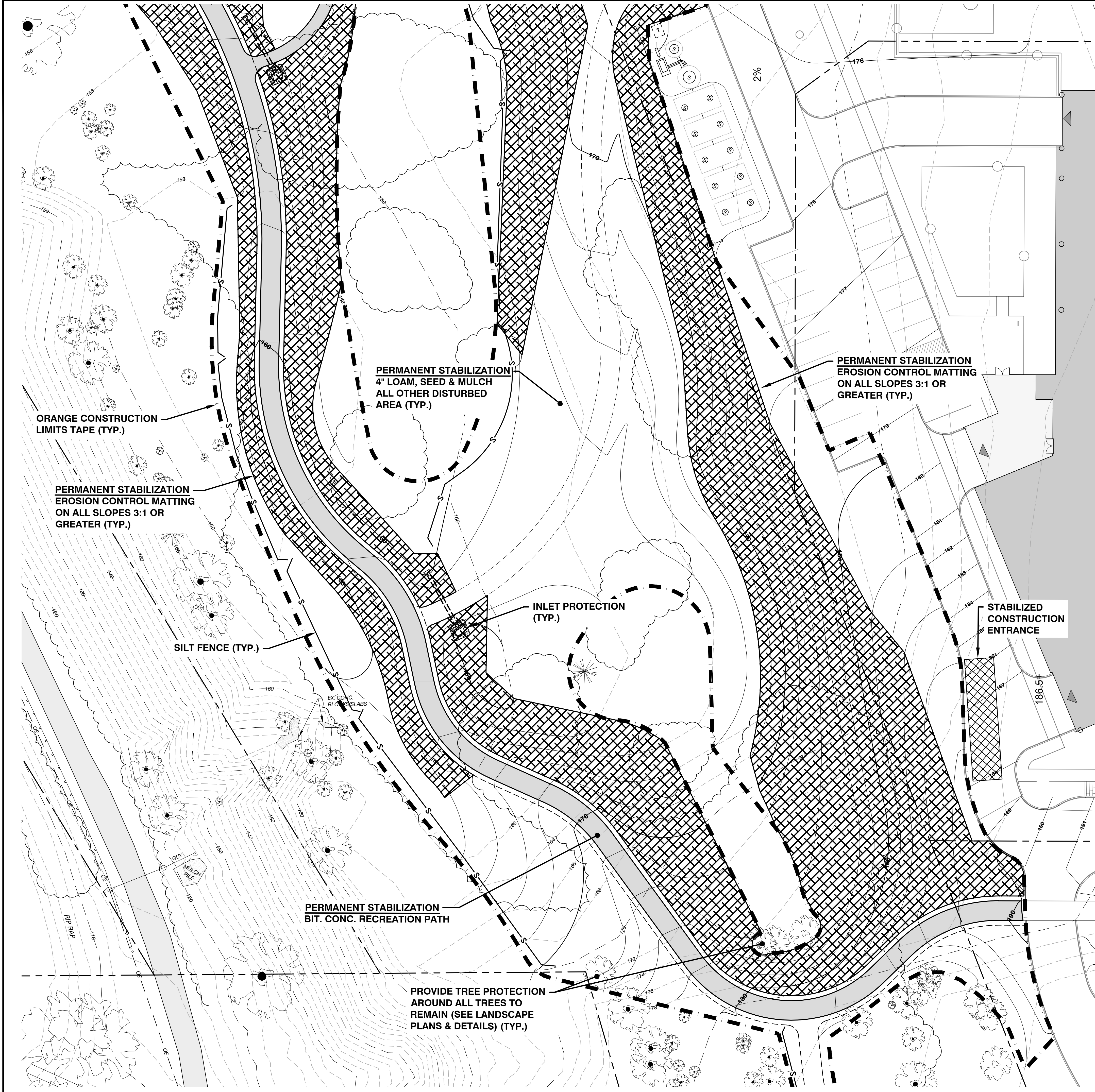












SITE ENGINEER:



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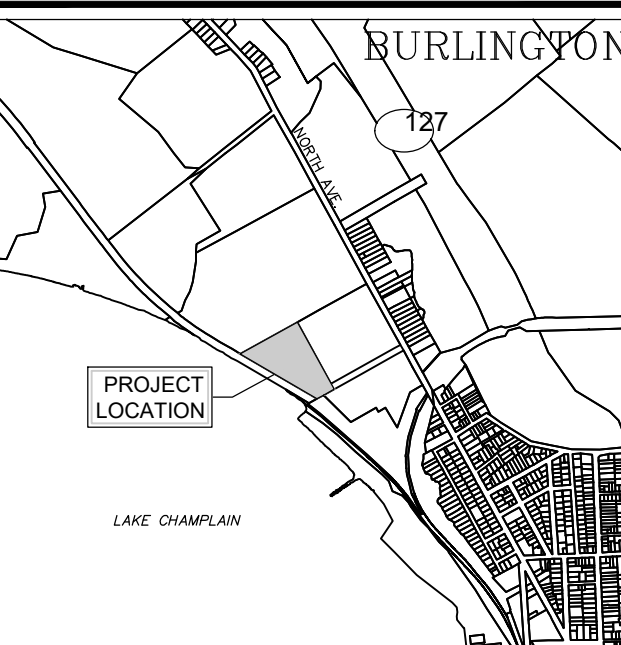
**BURLINGTON PARKS,  
RECREATION &  
WATERFRONT**

645 PINE ST., SUITE B  
BURLINGTON, VERMONT  
05401

PROJECT:

**311 NORTH AVE.  
MULTI-USE PATH**

311 NORTH AVE.  
BURLINGTON, VT



LOCATION MAP

1" = 2000'

| DATE    | CHECKED | REVISION                |
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| 7/19/24 | DSM     | PERMIT REVIEW SUBMITTAL |
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**PROPOSED  
CONDITIONS EPSC  
SITE PLAN**

DATE  
JUL., 2024

SCALE  
1" = 20'

PROJ. NO.  
18118

DRAWING NUMBER  
**C3.2**



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Erosion Prevention and Sediment Control Program

Construction Stormwater Discharge

The development of a new mixed use project by BC Community Housing is to be permitted as a Moderate Risk site under the State of Vermont Construction General Permit (CGP# 3-9020) for Discharges of Stormwater from Construction Sites issued for this project.

Parties associated with the issuance and implementation of the requirements set forth in the General Permit and the details within this document include:

- State of Vermont Department of Environmental Conservation, Water Quality Division (State)
- State of Vermont Environmental Commission (Act 250)
- On-Site Plan Coordinator (OSPC)
- Engineer (E)
- Site Owner (Owner)
- Site Erosion Prevention and Sediment Control Plan Designer (EPSC Designer)
- Owner's Builder/Contractor (Contractor)

This permit has the goal of minimizing discharges of sediment-laden water from the site by implementing appropriate best management practices (BMP's) during construction an stabilization of the site.

The Contractor will be responsible for ensuring compliance with all construction stormwater permit conditions within the entire project construction area.

Groundwater Dewatering

If dewatering of trenches, pits or other excavations is required during construction, the groundwater will be pumped to a suitable settling facility approved by the engineer and the VT DEC.

Inspection Program

The inspection responsibilities of the Contractor and the On-Site Plan Coordinator (OSC) are outlined in the chart below:

| Feature               | Daily | Weekly | After Rain Event |
|-----------------------|-------|--------|------------------|
| Storm Sewer Inlets    | C     | OSPC,  | C, OSPC          |
| Silt Fence            | C     | OSPC,  | C, OSPC          |
| Check Dams            | C     | OSPC,  | C, OSPC          |
| Construction Fencing  | C     | OSPC,  | C, OSPC          |
| Construction Entrance | C     | OSPC,  | C, OSPC          |
| Stabilized Areas      | C     | OSPC,  | C, OSPC          |
| Report                | C     | OSPC,  | OSPC             |

Cambrion Rise Erosion Protection and Sediment Control Narrative  
December 31, 2016

BC Community Housing, LLC proposes a mixed use project located on the former Burlington College property situated at 325, 351 and 375 North Avenue in Burlington, Vermont.

The project proposes to create 11 Lots, construct 11 building structures containing 677 residential units, 46 hotel rooms, 45,000 SF of non-residential support/amenity space, 45,000 SF of neighborhood oriented commercial space, 1093 parking spaces, 2750 LF of public roads and private access drives and associated infrastructure.

BC Community Housing is partnering with Champlain Housing Trust and Cathedral Square Corporation in the development of affordable and elder housing as part of the project.

**Existing Conditions** – The 33.65 acre property is located in the north end of Burlington between North Avenue and Lake Champlain. The former railroad and existing City bike path rights-of-way bisects the narrow band of land fronting Lake Champlain at the western limits of the property from the main body of the project site.

Of the 33.65 acres of the property, approximately 19.5 acres or 58% of the property is proposed to be disturbed as part of this project.

The site is comprised of a series of terraces all comprised of sandy soils in nature. The NRCS soil mapping of the property is summarized below.

- AdA – Adams and Windsor loamy sands, 0 to 5 percent slopes – 8.5% of the site and 5.8% of the disturbed areas.
- AdB – Adams and Windsor loamy sands, 5 to 12 percent slopes – 73.1% of the site and 82.0% of the disturbed areas.
- AdD – Adams and Windsor loamy sands, 12 to 30 percent slopes – 8.3% of the site and 10.9% of the disturbed areas.
- AdE – Adams and Windsor loamy sands, 30 to 60 percent slopes – 10.0% of the site and 0.8% of the disturbed areas.

All of the soils on the site have been identified through the NRCS WebSoil Survey to have a K value of 0.15. Due to the very low erosion potential and permeability of the soils, there are no Class II or Class III wetlands or drainages located within the main body of the proposed areas of disturbance.

The only drainages located on the property are located at the far west end of the property adjacent to or in association with the steep bluff leading down to the bike path.

The only Class III wetlands within the property limits are located at the far western portion of the site immediately upgradient of the two existing culverts that cross under the existing bike path.

Large portions of the proposed development area are currently in open meadow while approximately ¼ of the proposed development area is wooded. The main development site will be buffered by 12 acres of lands transferred to the City for use as park lands.

The Appendix A scoring did not take advantage of the fact that 95% of the site will benefit from 200' feet of vegetative buffer as there is one component of the project, the replacement of the existing culvert that will bring earth disturbance activities within 50–feet of a receiving water (Lake Champlain) or a wetland.

The topographical mapping for the property was developed from field survey which also located the specimen trees within the perimeter green space areas of the project to be retained.

**Areas of Concern** – The primary areas of concern for the management of EPSC include (These are depicted on Sheet C6.0):

- 1.The steep slope located immediately west of the existing buildings.
- 2.The Class III wetland where the culvert upgrade is to occur.
- 3.The protection of the trees to be retained along the exterior portion of the property and specifically those along the north border which are subject to a Development Agreement with the City.
- 4.The drainages located at the far west side of the property.

**Phasing** – The project is proposed to be constructed in Phases beginning in 2016 and, market forces permitting, to be completed in the Spring of 2023. The individual phasing limits are depicted on Sheets C6.10 – C6.15.

The phasing generally begins closest to North Avenue and extends westerly down the slope. Supporting road and utility infrastructure will be constructed with a top down approach as a means of minimizing the amount of disturbance. Most of the phases include earth disturbance activities that range from 2.1 to 4.9 acres in size. The first phase represents the largest amount of disturbance at any one time as it includes multiple partners (Lake Champlain Housing) and supporting infrastructure (construction laydown area) in this phase. The estimate total area of disturbance is 9.7 acres with the requirement that no more than five (5) acres can be disturbed at any one time.

**Best Management Practices**– The project will use a series of surface water diversion to not only protect those areas under construction but to also temporarily convey stormwater from these sites to a series of stormwater treatment facilities. Each facility will be designed to provide sediment trap removal capacity before sending the water to an infiltration facility. The goal being to collect and manage stormwater before it reaches the previously described drainages.

**Sediment Basin** – The initial phase of the project will require the use of a sediment basin (Basin A) to comply with the contributory watershed sizing requirements for the project. With the understanding that this facility is designed to double as an infiltration basin, the normal vertical pipe outlet has been replaced with infiltrative capacity through the bottom of the main body of the pond. The emergency outlet will be sized to accommodate the 10-year design storm for the conditions draining to the structure.

**Discharge Point and Conveyance** – The project has been designed so as to match the operational stormwater 10-year peak event from the property. For storm events greater than the 10-year design storm, additional runoff from the site is expected beyond the match of existing conditions. As a means of protecting the existing steep slope drainages, the project proposes to extend a 36" storm drain line from the project limits down to Lake Champlain. This is the only discharge point for the project.

Based upon the proposed drain inlet locations, this conveyance will include a drainage area of approximately 30 acres.

**Project Characteristics** – The average slope of the areas of disturbance is 8%.

The project proposes to impact less than 1,000 SF of the Class 3 wetlands adjacent to the existing 24" culvert t be replaced. Normally, this would be a non-reporting activity to the US Army Corps of Engineers, however, as the project proposes the installation of flexible armor from the plunge pool across the beach to the lake edge at an elevation below 98.0, a permit from the USACE will be required.

The project will require the import of approximately 50,000 CY of borrow materials. This material in anticipated to come from existing operating sand pits and supplemental permitting is not projected.

**Preconstruction measures** will include the use of construction fencing to demarcate the limits of disturbance along those areas where sensitive features are present (e.g. wetlands or tree retention areas), construction flagging for the remaining areas, Construction access (entrances road and laydown areas) stabilization, surveyed tree clearing limits and silt fence. These areas are shown on Sheets C6.1 – C6.4 and C6.10 – C6.16

**The on-site temporary measures** will include the use of contained sites (e.g. foundation excavation, utility trenching), inlet protection, temporary stabilization of disturbed surfaces through the use of hay mulch.

**The temporary off-site measures** (outside of specific phase areas) to be employed will include the previously discussed diversion swales and stormwater management facilities. These are shown on Sheets C6.11 – C6.16

**The permanent on-site measures** to be used to stabilize the site will include, flat roofs, paved roads, concrete walkways, hardscape common areas, lawn and slopes planted with the appropriate grass types. These are shown on Sheets C6.1 – C6.4.

**The permanent off-site measures** will include the use of a concrete pipe for the overflow conveyance from the project site to the lake, the use of a plunge pool at the outlet of the culvert and a flexible armor from the plunge pool, across the beach and to the lake. These are depicted on Sheet C6.1.

The project will require that within 7 days of initial disturbance that soils be permanently or temporarily stabilized through the use of hay mulch, ECM, or a crushed stone surface unless these areas are part of an on-going earth disturbance activity or are located within a contained area.

**Winter Construction** – Winter construction activities are proposed for the project and as such are subject to special measures to be employed between October 15 and April 15. This work will likely entail utility installation, excavating and backfilling of buildings. The winter construction requirements are specifically outlined on Sheet C6.9.

**EROSION AND SEDIMENT CONTROL STRATEGY** – The following techniques are anticipated to be utilized as part of the erosion and sediment control program. The timing and use of each of the techniques is further defined within the Construction Phasing of the project. But will be the responsibility of the contractor to implement on an as needed basis based upon the changing nature of the site disturbance activities only controlled by the site contractor.

1. Use rapidly germinating cover crops prior to seeding when the ground would otherwise be bare.
2. Include rapidly germinating grasses in the seed mixtures when they will not compromise the integrity of the final product.
3. Utilize hydroseeding with mulch when feasible.
4. Utilize erosion control netting or blankets, with or without seed contained in them on slopes greater than 3:1.
5. Utilizing stabilization materials or sodding areas where runoff is rapid or concentrated.
6. Limiting traffic in the vicinity of streams and wetlands and installing as few temporary crossings as possible.
7. Installing water bars (swale/berms) on slopes to and channels before it gains sufficient volume and momentum to cause scouring.

8. Using stone check dams and silt fences once the soil has begun to move.
9. Preserving existing trees and vegetation near and within buffer areas until after the site has been stabilized.
10. Controlling dust by providing parking lots with prepared surfaces, limiting traffic in all possible ways, planting stockpiles with cover crops or protective blankets, using water trucks, refraining from cultivating and smoothing seedbeds until immediately prior to seeding.

**Field Protocol** – Areas of special concern will be reviewed with the Contractor prior to initiating site clearing activities. These areas will be continually reviewed by the Contractor and the OSPC and any issues will be identified in the daily or weekly reports. All reports shall be distributed via e-mail to all parties in support of the efforts to address areas of concern in a timely manner.

**Best Management Practices** – BMP's – Examples include, but are not limited to: sediment fence, erosion control matting, seed, and mulch in accordance with the attached Construction Phasing plan and the Vermont Erosion Prevention and Sediment Control Filed Guide.

Installation Sequencing

1. Construction Staking  
A. The construction limits are to be staked in the field by a qualified Surveyor.  
B. The remaining clearing and site disturbance limits shall be reviewed by the Engineer prior to initiating any clearing. The Engineer shall designate specimen trees and critical vegetative cover along buffer areas that are to remain during the initial phases of construction.

2. Clearing – The clearing limits shall be demarcated in the field with continuous flagging. Construction fencing shall be installed along the edges of any stream or wetland buffer areas adjacent to or on the lot. Prior to any timber being harvested and removed from the site, a construction entrance pad shall be installed at the entrance point to the project site. Chipping of branches and other woody material is allowed but the material must be disposed of in an approved manner.

3. Inlet Protection – Ensure that BMP's are in place and functioning at catch basins, drainage swales, culvert inlets, and other areas as shown on the EPSC site plan.

4. Protection of Adjacent Sites – Install BMP's along the common lot line of adjacent sites. This would include construction fencing to help avoid unintentional encroachment onto the adjacent property and silt fence when the adjacent lot is downgradient of the construction site.

5. Protection of Construction Site – Prior to initiating earthwork on the lot, surface runoff from areas upgradient portions of the construction site shall be diverted from the proposed areas of disturbance using diversion swales, structures, sand bags, curbing, or other approved method. Protect steep exposed slopes from surface runoff by collecting runoff at the top of the slope and diverting it into a stabilized conveyance, such as a slope drain or stabilized swale.

6. Grubbing  
a. Grubbing shall occur only after the erosion control measures around the downgradient perimeter of the site has been established. Those locations shall be reviewed with the Environmental Specialist and Independent Engineer. Existing topsoil shall be retained and stockpiled on site for re-use.  
B. The Contractor shall remove all remaining woody material and tree stumps and dispose of them utilizing one or more of the following methods:  
i. Burning, provided that permits are acquired from the State of Vermont Solid Waste Management Division and the City of South Burlington.  
ii. Disposal on site within designated slope disposal areas only after an insignificant waste Disposal Permit is acquired. At these sites the following standards shall be met  
a. 3' separation to the seasonal high groundwater table.  
b. 100' separation to surface waters.  
c. Thorough mixing of soil and woody material to minimize future settlement.

- iii. Covering with a minimum of four (4) feet of cover material.  
iii. Chipping with on-site disposal in accordance with Item 5 or disposal off-site in accordance with State requirements.  
iv. Disposal at a certified landfill facility.  
C. All grubbing of woody materials shall be completed to a depth of at least 12".  
D. The Contractor shall remove all medium to large stones and boulders present within the limits of disturbance including future drainage and infrastructure improvements.  
i. The larger boulders shall be saved for use in retaining walls.  
ii. The smaller stones may be buried in predetermined disposal sites.

7. Soil Stockpiles  
A. The Contractor shall strip and stockpile as much as possible of the native topsoil for re-use during a later stage of the project.  
B. Each topsoil stockpile shall be placed in locations respective of existing environmental features of the site. Special consideration shall be made to maximize the distance (minimum 100') to the nearest water course.  
C. Each topsoil pile shall be surrounded on the downgradient side by a row of silt fence.  
D. Any topsoil pile which is to remain in place for greater than 15 days shall be temporarily seeded with winter rye to preserve the integrity and minimize the erosion of the soil constituents and release of soluble nutrients.  
E. The Contractor shall locate stockpiles on the uphill side of the disturbed areas, if possible. During windy conditions, stockpiled material shall be covered or watered appropriately to prevent wind erosion.

8. Earth Excavation/Grading  
A. Mass earth placement to create the building plateau shall commence only after all remaining EPSC measures depicted on the plans are installed.  
B. Surface water diversion BMP's shall employed at the high point of the site until the new drainage swale/hollow is installed.  
C. The Contractor shall also limit the soil disturbance and seeding application dates to between April 16th and September 15th.

- D. All exposed soils areas (not including structural fill soils or stabilized stone areas) shall be protected prior to any forecasted rain event with mulch or erosion control matting. Pin matting with wire staples in accordance with the manufacturers recommendations to ensure full bonding with soil surface.  
E. Install stone check dams in grass-lined swales 50 feet on center to prevent silt from washing into the drainage system during construction. Check dams are to be removed when vegetation is established.

9. Temporary Construction Entrance – Required for entrance and egress points from the site.

10. Planting Preparation, Seed, Mulch, Germination, Maintenance  
A. The preparation of the topsoil for planting includes final smoothing and removal of small stones. This work shall occur immediately prior to seeding or placement of EC matting so as to avoid exposure to erosion damage and to reduce the amount of dust generated as part of this process.  
B. Planting is to occur immediately after the topsoil preparation with special caution being given to upcoming storm events that may displace the seed/soil.  
C. The planted areas shall be water regularly to protect the new plants but not over watered so as to cause excess runoff and erosion.  
D. All ditches that are not stone-lined shall be topsoiled, and stabilized with erosion control matting. Any area which shows signs of erosion shall be restabilized immediately and maintained until permanent vegetation is established.  
E. Maintenance:  
1. All erosion control measures shall be inspected weekly and repaired and/or replaced as needed.  
2. All erosion control measures shall be inspected after periods of heavy rain.  
3. The stabilized road entrance shall be top dressed with additional stone should the existing stone become clogged with sediment.  
4. Hay or straw mulch is subject to wind action. Mulch, where permitted) may require anchoring as the weather conditions warrant.

11. Surface Stabilization – The following stabilization methods are required:  
A. Temporary stabilization – Straw mulch (during the earliest phases of the project) or erosion control matting placement is required on all non-contained disturbed areas prior to forecasted rain events.  
B. Install stone check dams in drainage swales 50 feet on a center to prevent silt from washing into the drainage system during construction. Check dams shall be removed when vegetation is established.  
C. Control dust through the application of water. The exact number of applications and amount shall be based upon field and weather conditions. It shall be spread in such manner and by such devices that uniform distribution is attained over the entire area on which it is ordered placed.  
D. Install crushed stone apron of at least 15' width around the perimeter of the building following backfill of the foundation walls.  
E. Install temporary (sacrificial) crushed stone on all access ways and laydown areas. These areas will be covered later with the roadway/perking lot base materials or with topsoil.  
F. Permanent Stabilization – Required of all surfaces at the completion of construction. The Contractor will install 4" topsoil, sod, seed (where permitted), fertilize, lime, and mulch (seeded areas) the disturbed areas as soon as possible following completion of construction.

1. Use rapidly germinating cover crops prior to seeding when the ground would otherwise be bare.
2. Include rapidly germinating grasses in the seed mixtures when they will not compromise the integrity of the final product.
3. Utilize hydroseeding with mulch when feasible.

Owner/Contractor Responsibilities

1. The Owner/Contractor (O/C) is responsible for the on-going maintenance of all lot specific erosion prevention and sediment control devices and practices. Any subcontractor conducting earth disturbance activities on the project site shall review the EPSC plan and General Permit and shall complete an application and file with the State a request for Co-Permittee status.

2. Periodic inspections shall be performed in accordance with the above schedule to ensure that the erosion and sediment control measures are functioning as required. In addition to the standard periodic inspections, inspections of all of the on-site systems shall be conducted after a rain event causing stormwater to leave the site. Any problems noted during these inspections shall be corrected immediately.

3. Once construction has commenced, the O/C is responsible for the maintenance of erosion and sediment control measures protecting nearby stormwater collection systems and water courses. It is critical that sediment not be allowed to invade the receiving waters.

4. The temporary construction entrance provides a place for parking vehicles off-street and a spot where material can be off-loaded. The intent of the requirement is to provide a stable surface for parking vehicles where mud and debris is not likely to be tracked onto the street. Proper maintenance of the area is required until such time as a permanent driveway can be put into place.

5. During the entire construction process, the O/C is responsible for ensuring that mud, dirt, rocks, and other debris are not allowed to erode or be tracked onto the street system by construction vehicles. Should any mud or other debris find its way to the road system, the O/C shall take immediate steps to have it removed.

CONTINUED ON TO C6.6 EPSC

SITE ENGINEER:



CIVIL ENGINEERING ASSOCIATES, INC.  
10 MANSFIELD VIEW LANE, SOUTH BURLINGTON, VT 05403  
802-864-2323 FAX: 802-864-2271 web: www.cesa-vt.com

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|                        |  |
|------------------------|--|
| DRAWN<br><b>SAL</b>    |  |
| CHECKED<br><b>DSM</b>  |  |
| APPROVED<br><b>DSM</b> |  |

CLIENT:

**BURLINGTON PARKS,  
RECREATION &  
WATERFRONT**  
**645 PINE ST., SUITE B  
BURLINGTON, VERMONT  
05401**

PROJECT:

**311 NORTH AVE.  
MULTI-USE PATH**

**311 NORTH AVE.  
BURLINGTON, VT**

| DATE    | CHECKED | REVISION                |
|---------|---------|-------------------------|
| 7/19/24 | DSM     | PERMIT REVIEW SUBMITTAL |
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EPSC NARRATIVE

|                           |                               |
|---------------------------|-------------------------------|
| DATE<br><b>JUL., 2024</b> | DRAWING NUMBER<br><b>C3.3</b> |
| SCALE<br><b>AS SHOWN</b>  |                               |
| PROJ. NO.<br><b>18118</b> |                               |



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6. Maintenance – Silt Fence

- A. Inspect sediment fences daily to ensure that construction activities have not impacted their operability and after each rainfall event causing runoff from the site.
- B. Should the fabric of the sediment fence collapse, tear, decompose, or become ineffective, replace promptly.
- C. Remove the sediment deposits as necessary to provide adequate storage volume for the next rain event and to reduce pressure on the fence. Take care to avoid damaging or undermining the fence during clean-out.
- D. If the utilities are installed after BMP's have been put into place, the permit holder is responsible for control of erosion and sediment during the construction process and for ensuring that all BMP devices are re-installed per the original design.

On-Site Plan Coordinator Inspections

1. The OSPC will normally inspect erosion prevention and sediment control measures in conjunction with routine inspections. Inspections will ensure that proper placement and installation of the erosion prevention and sediment control measures are in place.

2. The first inspection will occur prior to clearing of the site to ensure that proper BMP's are in place, including proper demarcation of the clearing limits, installation of construction fencing along the stream/wetland buffer limits, and any other devices required to protect the receiving waters from sediment deposition during the clearing phase.

3. Prior to initiating grubbing and mass earth excavation, the OSPC shall inspect the site to ensure that the construction fencing, silt fence, construction entrance, and other required BMP's are in place.

4. The OSPC will conduct weekly inspections and will prepare weekly reports which are to remain on-site until final stabilization is achieved.

Additional Requirements:

1. All sediment removed from sediment control practices as part of maintenance shall be disposed of in an area that is:
- Less than 5% slope.
  - At least 100ft from any downslope water body or conveyance to a waterbody (including storm drain inlet or ditch)
  - Area shall be vegetated

2. Stabilize Exposed Soil

Purpose:

Seeding and mulching, applying erosion control matting, and hydroseeding are all methods to stabilize exposed soil. Mulches and matting protect the soil surface while grass is establishing.

Requirements:

All areas of disturbance must have temporary or permanent stabilization within 7 days of initial disturbance, as stated in the project authorization. After this time, any disturbance in the area must be stabilized at the end of each work day.

The following exceptions apply:

- Stabilization is not required if earthwork is to continue in the area within the next 24 hours and there is no precipitation forecast for the next 24 hours.
- Stabilization is not required if the work is occurring in a self-contained excavation (i.e. no outlet) with a depth of 2 feet or greater (e.g. house foundation excavation, utility trenches).

All areas of disturbance must have permanent stabilization within 48 hours of reaching final grade.

How to comply:

Prepare bare soil for seeding by grading the top 3 to 6 inches of soil and removing any large rocks or debris.

Seeding Rates for Temporary Stabilization

April 15 – Sept. 15 --- Ryegrass (annual or perennial: 20 lbs/acre)

Sept. 15 – April 15 --- Winter rye: 120 lbs/acre

Seeding Rates for Final Stabilization: Choose – See Sheet C6.6

Mulching Rates

April 15 – Sept.15 -- Hay or Straw: 1 inch deep (1–2 bales/1000 s.f.)

Sept.15 – April 15 -- Hay or Straw: 2 in. deep (2–4 bales/1000 s.f.)

Erosion Control Matting

As per manufacturer's instructions

Hydroseed

As per manufacturer's instructions

3. Stabilize Soil at Final Grade

Purpose:

Stabilizing the site with seed and mulch or erosion control matting when it reaches final grade is the best way to prevent erosion while construction continues.

Requirements:

Within 48 hours of final grading, the exposed soil must be seeded and mulched or covered with erosion control matting.

How to comply:

Bring the site or sections of the site to final grade as soon as possible after construction is completed. This will reduce the need for additional sediment and erosion control measures and will reduce the total disturbed area.

For seeding and mulching rates, follow the specifications under Rule 8, Stabilizing Exposed Soil.

4. Dewatering Activities

Purpose:

Treat water pumped from dewatering activities so that it is clear when leaving the construction site.

Requirements:

Water from dewatering activities that flows off of the construction site must be clear. Water must not be pumped into storm sewers, lakes, or wetlands unless the water is clear.

How to comply:

Using sock filters or sediment filter bags on dewatering discharge hoses or pipes, discharge water into silt fence enclosures installed in vegetated areas away from waterways. Remove accumulated sediment after the water has dispersed and stabilize the area with seed and mulch.

END OF SECTION ESPC NARRATIVE

SECTION 02150 – EROSION CONTROL

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes:
- The work under this section includes but is not limited to providing all labor, equipment and materials for the installation of all required site related erosion control measures. If not otherwise directed on the plans, erosion control shall be in strict conformity with the latest revision of the "Vermont Erosion Prevention and Sediment Control Field Guide" available from the Stormwater Section of the Vermont Water Quality Division.

- B. Related sections:
- Section 02210 – Site Earthwork
  - Section 02936 – Permanent Seeding

1.02 GENERAL NOTES

A. The discharge of sediment laden water from the project site is prohibited. All discharged water from dewatering operations shall discharge into a temporary sedimentation basin.

B. Contractor shall install all erosion control measures as depicted on plans and details or as recommended by the Stormwater Section of the Vermont Water Quality Division prior to any construction. Contractor shall also be responsible for inspecting and maintaining all erosion control measures until project is completed.

C. Contractor shall also limit the soil disturbance and seeding application dates to between April 15th and September 15th. If soil disturbance occurs later than October 15th and prior to April 15th, winter erosion control measures will be necessary. Contractor shall consult with the Engineer for additional site specific winter erosion control measures.

D. All stockpile material (topsoil, borrow, etc.) will have a silt fence constructed around the perimeter. Seed and mulch stockpiled material as soon as possible to prevent soil erosion and sedimentation off site. Locate stockpiles on the uphill side of the disturbed areas, if possible. During windy conditions, stockpiled material shall be covered or watered appropriately to prevent wind erosion.

E. Slopes greater than 3:1 (H:V) shall have erosion control matting installed to stabilize the slope and reduce the erosion potential. Install matting so that all parts are in contact with the underlying soil. Pin matting with wire staples 3' o.c. to ensure full bonding with soil surface. Matting shall be installed in accordance with manufacturer's recommendations.

F. Control dust through the application of calcium chloride or water. An average application of one pound of calcium chloride per square yard of exposed area should be considered for each treatment. The exact number of applications and amount of dust controller shall be based upon field and weather conditions. It shall be spread in such manner and by such devices that uniform distribution is attained over the entire area on which it is ordered placed.

PART 2 – PRODUCTS

2.01 EROSION CONTROL NETTING

A. Jute netting shall consist of undyed and unbleached yarn woven into a uniform open plain weave mesh.

2.02 EROSION CONTROL MATTING

A. Where required on the plans or where directed by the Engineer, erosion control blankets (matting) shall be North American Green S150BN for swales and slope stabilization, or approved equal, for all areas for permanent installation, and C125 and SC150 where matting is being used as temporary protection of disturbed soils until a final surface stabilization method is employed.

2.03 FILTER FABRIC

A. When filter fabric is required, it shall conform to the requirements of Mirafi 500X or approved equivalent.

2.04 CALCIUM CHLORIDE

A. Calcium chloride shall conform to the requirements of AASHTO M 144. Either regular flake calcium chloride, Type 1 or concentrated flake, pellet or other granular calcium chloride, Type 2, may be used.

2.05 WATER

A. All water used shall be clean and free of harmful amounts of oil, salt, acids, alkalies, sugar, organic matter and other substances injurious to the finished product, plant life or the establishment of vegetation.

2.06 SEDIMENT WATTLES

A. Sediment wattles shall be King Fibre Corporation silt trapper sediment wattles or approved equal.

2.07 POLYACRUMIDE

A. Polyacrumide (polymer) logs (blocks) shall only be used with permission from the Engineer and VT ANR Water Quality Division. Type shall be Applied Polymer Systems, Inc. floc log or approved equal. The type of floc log used shall be based upon a site specific testing of the native soils.

2.08 STONE CHECK DAMS

A. Stone check dams should be constructed of 2 to 3 inch stone. Hand or mechanical placement will be necessary to achieve complete coverage of the ditch or swale and to ensure that the center of the dam is lower than the edges. The maximum contributing drainage area from any one check dam shall not exceed two acres. See the detail drawing in the Erosion Control Details Drawings for the proper installation of stone check dams.

PART 3 – EXECUTION

3.01 HAY BALE CHECK DAM AND INLET PROTECTION

A. Hay bales shall not be used to construct check dams or as a means of inlet protection.

3.02 SILT FENCES

A. The silt fences shall be constructed in accordance with the construction detail. The fence shall generally be placed 10 feet from the toe of the slope or as shown on the plans. The ends of the fence shall be placed uphill to form a horseshoe shape to trap all runoff. Silt fence shall not be placed across areas of concentrated flow.

B. The silt fences shall be inspected periodically for damage or build-up of sediments. All damaged fences shall be repaired or replaced. Sediment deposits shall be removed from the fence as they build up and be placed in an area where there is no danger of further erosion.

3.03 EROSION MATTING

A. Erosion matting shall be placed on all grass-lined ditches with profile grades exceeding 5.0% and all other areas called out on the plans, and shall be placed and maintained in accordance with the Vermont Agency of Transportation Standard Specifications Sections 654 and 755.07.

3.04 RESTORATION

A. As soon as construction is completed in a given area, it shall be topsoiled, seeded, fertilized and mulched as specified in Section 02936 – Permanent Seeding.

3.05 STABILIZED ROAD ENTRANCE

A. A stabilized pad of crushed stone located at any point where traffic will be entering or leaving the construction site to or from a public right-of-way or street or as shown on the drawings shall be constructed for the purpose of preventing the tracking of sediment onto public rights-of-way.

- B. Design Criteria:
- Use 1.5 to 2.5 inch stone.
  - Use 8 inch layer of stone.
  - Stone pad shall be full width of entrance.
  - Minimum length shall be 50 feet.

3.06 GRASS-LINED DITCHES

A. All ditches that are not stone-lined shall be topsoiled, seeded, fertilized and mulched. Any area which shows signs of erosion shall be reseeded immediately and maintained until permanent vegetation is established.

3.07 MAINTENANCE

A. All erosion control measures shall be inspected daily and repaired and/or replaced as needed.

B. All erosion control measures shall be inspected after periods of heavy rain.

C. The stabilized road entrance shall be top dressed with additional stone should the existing stone become clogged with sediment.

D. Hay or straw mulch is subject to wind action. Mulch may require anchoring as the weather conditions warrant.

3.08 STONE CHECK DAMS

A. The drainage area of the ditch or swale being protected should not exceed 10 acres.

B. The drainage area to any check dam shall not exceed 2 acres.

C. The maximum height of the check dam should be 2 feet. The center of the check dam must be at least 6 inches lower than the outer edges. The maximum spacing between the dams should be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.

D. Check dams should be installed before runoff is directed to the swale or drainage ditch.

3.09 DEWATERING METHODS

A. All dewatering methods associated with this project are to be approved by the VT DEC and the engineer prior to use.

END OF SECTION 02150

SECTION 02936 – PERMANENT SEEDING

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes:
- Furnishing all labor, materials, and equipment to complete all seeding work as shown on the drawings and specified herein.
  - Except where otherwise shown or specified, the Contractor shall seed all areas where new contours are shown on the drawings and all areas where existing ground cover has been disturbed by the Contractor's operations.

B. All work and materials of this Section shall conform to the applicable requirements of the VAOT Standard Specifications, Division 600.

1.02 SUBMITTALS

- A. Provide the following for approval prior to delivery to the site:
- Supplier's Certificate of Compliance attesting that lime, fertilizer and seed meet the requirements specified.
  - The Contractor shall provide representative topsoil samples for testing and approval, deliver samples to a public extension service agency testing laboratory, have testing report sent directly to the Engineer and pay all costs. Testing shall report on mechanical and chemical (pH soluble salts) analysis. Report shall be submitted at least one month before any loaming is to be done.

1.03 SEEDING SEASONS

A. Seeding and initial fertilizing shall be done between April 1 and June 1, between August 15 and October 15, or as permitted. Seeding shall not be done during windy weather or when the ground is frozen, excessively wet, or otherwise untillable. If seeding is done during July or August, additional mulch material may be required by the Engineer.

PART 2 – PRODUCTS

2.01 LIME

A. Lime shall be standard, ground dolomite limestone, agricultural grade, containing a minimum of 95% of calcium and magnesium carbonates. 100% shall pass the 10 mesh sieve; minimum 90% shall pass the 20 mesh sieve; minimum 40% shall pass the 100 mesh sieve.

2.02 FERTILIZER

A. Fertilizer shall be commercial grade granular fertilizer as required for soil conditions as specified in Section 643 of the VAOT Standard Specifications. The fertilizer shall be delivered to the project in new, clean, sealed containers which bear a label fully describing the contents, the chemical analysis of each nutrient, the fertilizer grade, the net bulk, the brand and the name and address of the manufacturer. The fertilizer and labels shall conform to all existing State and Federal regulations, and shall meet the standards of the Association of Official Agricultural Chemists.

2.03 GRASS SEED

A. Provide fresh, clean, new-crop seed of the grass species, proportions and minimum percentages of purity, germination and maximum percentage of weed seed as follows:

1. Park seed shall normally be used on loam areas. This seed mixture shall conform to the following table:

| Kind of Seed        | Minimum Purity | Minimum Germination | Lbs/Acre |
|---------------------|----------------|---------------------|----------|
| Creeping Red Fescue | 96%            | 85%                 | 40       |
| Perennial Ryegrass  | 98%            | 90%                 | 50       |
| Kentucky Bluegrass  | 97%            | 85%                 | 25       |
| Redtop              | 95%            | 80%                 | 5        |
| TOTAL =             |                |                     | 120      |

2. Slope seed shall normally be used for all slope work, usually 3:1 or steeper and shall conform to the following table:

| Kind of Seed        | Minimum Purity | Minimum Germination | Lbs/Acre |
|---------------------|----------------|---------------------|----------|
| Creeping Red Fescue | 96%            | 85%                 | 35       |
| Perennial Ryegrass  | 98%            | 90%                 | 30       |
| Redtop              | 95%            | 80%                 | 5        |
| Alsike Clover       | 97%            | 90%                 | 5        |
| Birdsfoot Trefoil   | 98%            | 80%                 | 5        |
| TOTAL =             |                |                     | 80       |

3. Shade seed shall normally be used in shaded areas in or along the edge of wooded areas. This seed mixture shall conform to the following table:

| Kind of Seed        | Minimum Purity | Minimum Germination | Lbs/Acre |
|---------------------|----------------|---------------------|----------|
| Creeping Red Fescue | 95%            | 80%                 | 30       |
| Tall Fescue         | 96%            | 80%                 | 20       |
| Crownvetch          | 95%            | 80%                 | 30       |
| TOTAL =             |                |                     | 80       |

B. The seed mixture shall be delivered in new, clean, sealed containers. Labels and contents shall conform to all State and Federal regulations. Seed shall be subject to the testing provisions of the Association of Official Seed Analysts.

C. Seed that has become wet, moldy, or otherwise damaged will be rejected.

2.04 MULCH

- A. Mulch must be installed on all seeded areas. The following mulches are acceptable for use.
- Hay mulch free of weeds and coarse matter at a rate of 90 pounds per 1,000 square feet.
  - Wood fiber applied in a slurry (1/6" or longer) at a rate of 40 pounds per 1,000 square feet.

2.05 WATER

A. All water used shall be obtained from fresh water sources and shall be free from injurious chemical and other toxic substances harmful to plant life. No water which is brackish will be permitted at any time. The Contractor shall identify to the Engineer all sources of water at least two weeks prior to use. The Engineer, at his discretion, may take samples of the water at the source or from the tank at any time and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source which is disapproved by the Engineer following such tests.

PART 3 – EXECUTION

3.01 PREPARATION

A. Examine finish surfaces and grades. Do not start seeding work until unsatisfactory conditions are corrected. Perform seeding work only after planting and other work affecting ground surface has been completed.

B. Notify Landscape Architect at least seven (7) working days prior to starting seeding.

- C. Prepare areas immediately prior to seeding as follows:
- Loosen soil of seed areas to a minimum depth of 4".
  - Remove stones over 1" in any diameter and sticks, roots, rubbish and extraneous matter.
  - Remove existing weeds and grasses by pulling or tilling under.
  - Grade areas to be seeded to a smooth, free draining even surface with a loose, moderately coarse texture.
  - Remove ridges and fill depressions as required to drain.
  - Restore prepared areas if eroded or disturbed prior to seeding.

3.02 SEEDING CONDITIONS

A. Seeding shall not be done when the ground is frozen, snow covered, muddy, or in any other unsatisfactory condition for planting. No seeding operations shall be conducted under adverse weather conditions or when soil moisture conditions are unfavorable (too wet or too dry) or when winds exceed 5 MPH.

B. Construction methods shall be those established as agronomically acceptable and feasible. The Contractor shall keep all equipment and vehicular and pedestrian traffic off areas that have been seeded to prevent excessive compaction and damage to young plants. Where such compaction has occurred, the Contractor shall rework the soil to make a suitable seed bed; then reseed and mulch such areas with the full amounts of the specified materials, at no extra expense to the Owner.

C. Surface and seepage water should be drained or diverted from the site to prevent drowning or winter killing of the plants.

D. All areas and parts of areas which fail to show a uniform stand of grass for any reason whatsoever shall be reseeded, and such areas and parts of areas shall be seeded repeatedly until all areas are covered with a satisfactory growth of grass.

E. Watering is considered a necessary element for establishment and survival.

F. Where ryegrass has been planted for temporary erosion control and has not been eliminated prior to the completion of the work, such areas shall be discd at least 3 inches deep and seeded to permanent grasses to prevent the ryegrass from reseeding and becoming competitive with and retarding development of the permanent cover.

CONTINUED ON SHEET C6.7

SITE ENGINEER:



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**645 PINE ST., SUITE B  
BURLINGTON, VERMONT  
05401**

PROJECT:

**311 NORTH AVE.  
MULTI-USE PATH**

**311 NORTH AVE.  
BURLINGTON, VT**

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**EPSC NARRATIVE**

DATE

JUL., 2024

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**C3.4**



3.02 SEEDING

A. Lime and fertilizer should be applied prior to or at the time of seeding and incorporated into the soil. Kinds and amounts of lime and fertilizer should be based on an evaluation of soil tests. When a soil test is not available, the following minimum amounts should be applied:

Agricultural limestone, 2 tons per acre or 100 lbs. per 1,000 square feet.

Nitrogen (N), 50 lbs. per acre or 1.1 lbs. per 1,000 square feet.

Phosphate (P2O5), 100 lbs. per acre or 2.2 lbs. per 1,000 square feet.

Potash (K2O), 100 lbs. per acre or 2.2 lbs. per 1,000 square feet.

(Note: This is the equivalent of 500 lbs. per acre of 10–20–20 fertilizer or 1,000 lbs. per acre 5–10–10).

B. Seed should be spread uniformly by the method most appropriate for the site. Methods include broadcasting and hydroseeding as follows:

1. Broadcasting: Sow seed using mechanical spreader at a rate of 4 lbs./1,000 square feet. Distribute seed evenly over entire area by sowing equal quantity in tow directions at right angles to each other. Rake seed lightly into top 1/8" of topsoil, roll lightly and water with a fine spray.
2. Hydroseeding: Mix specified seed, fertilize and pulverize mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application. Apply slurry uniformly to all areas to be seeded. Rate of application as required to obtain specified seed sowing rate.

3.03 MULCHING

A. Mulch materials shall be spread uniformly by hand or machine at a rate of two 50 lb. bales per 1,000 square feet.

B. Organic Mulch Anchoring – Straw or hay mulch must be anchored immediately after spreading to prevent wind blowing.

3.04 MAINTENANCE

A. The maintenance period shall begin immediately after seeding and shall continue until acceptance.

B. All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. Where erosion is observed, additional mulch shall be applied. Net should be inspected after rainstorms for dislocation or failure. If washouts or breakage occur, reinstall net as necessary after repairing damage to the slope. Inspections should take place until grasses are firmly established. Grasses shall not be considered established until a ground cover is achieved which is mature enough to control soil erosion and to survive severe weather conditions. Where mulch is used in conjunction with ornamental plantings, inspect periodically throughout the year to determine if mulch is maintaining coverage of the soil surface; repair as needed.

C. Seeding areas shall be protected and maintained by watering, reseeding, mowing, weeding, rolling, insect or disease control measures, re-fertilizing and repair of washouts which are necessary.

D. The Contractor shall maintain all seeded areas until full vegetation is established.

E. All seeded areas shall be kept free from weeds and debris, such as stones, cables, baling wire, and all slopes 4:1 or less (flatter) and level turf shall be mowed in the following manner:

1. When grass reaches a height of 4–6", mow to a height of 3".
2. At least two cuttings shall be made prior to final acceptance.

F. Following mowing, all permanent seeding grass areas (mowed and unmowed) shall receive a uniform application of slow release fertilizer hydraulically placed at the rate of 10 pounds per 100 square feet.

3.05 ACCEPTANCE

A. Inspection to determine acceptance of seeded areas will be made by the Landscape Architect, upon Contractor's written request.

1. Provide notification at least ten (10) working days before requested inspection date.

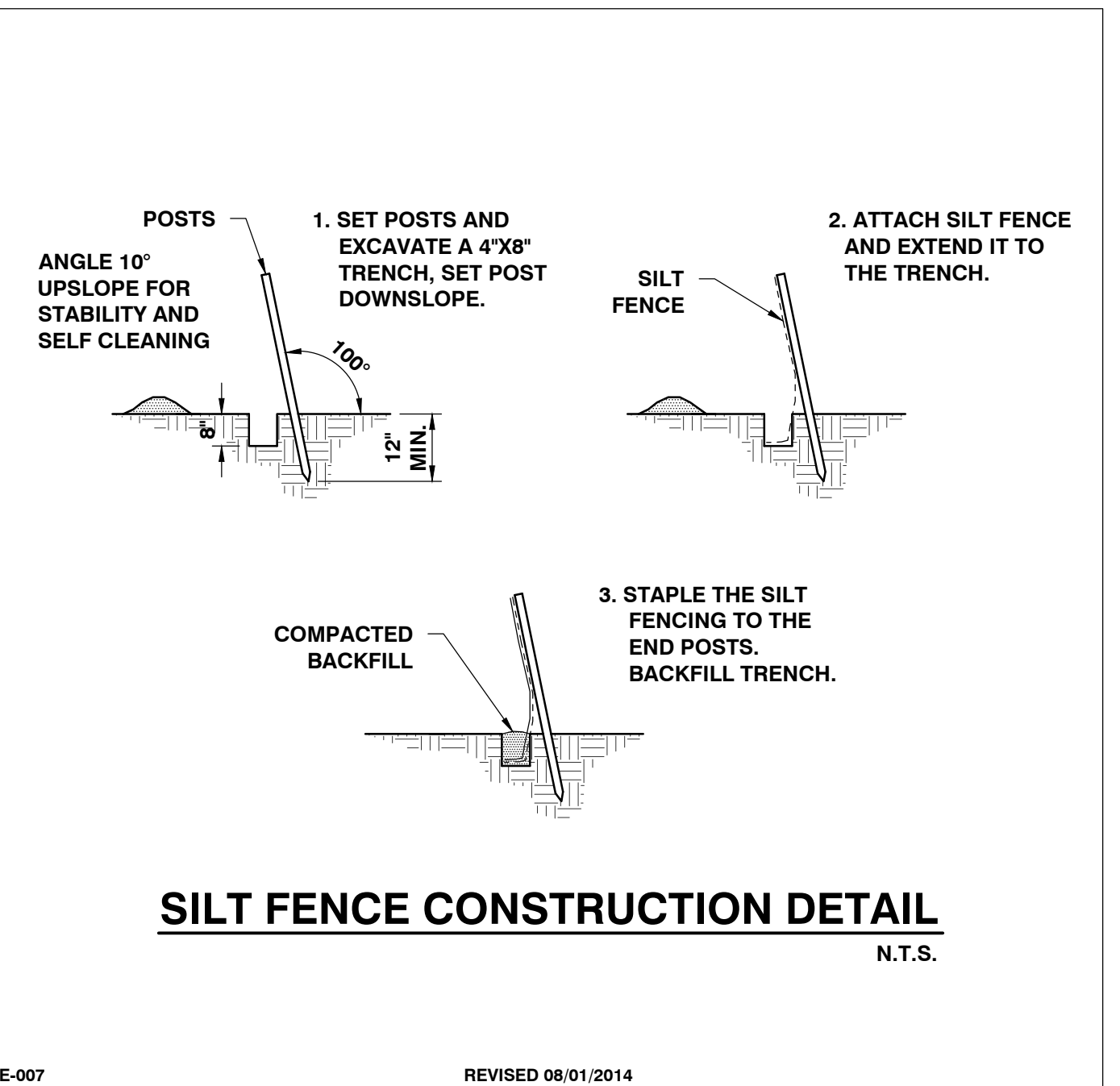
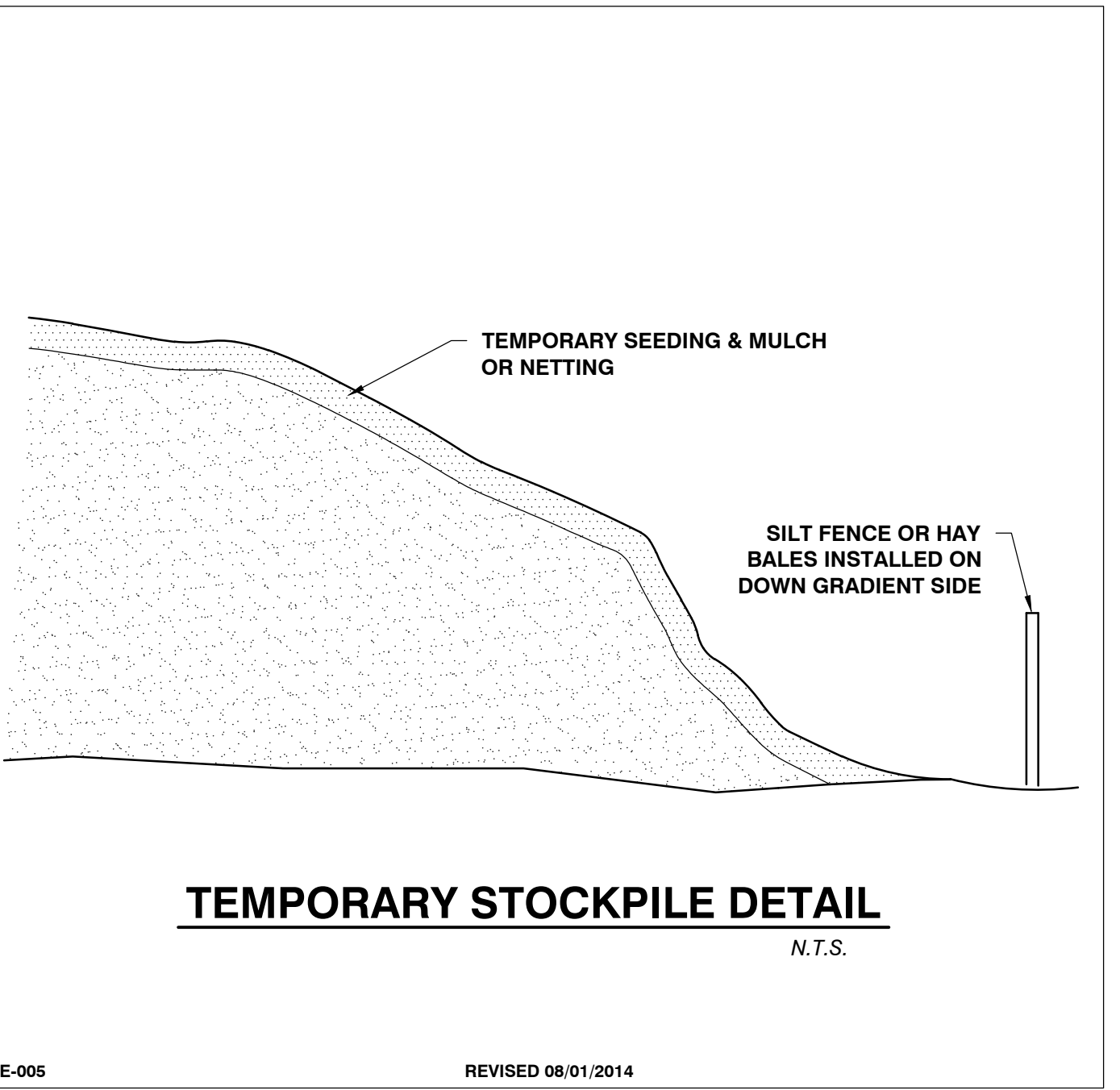
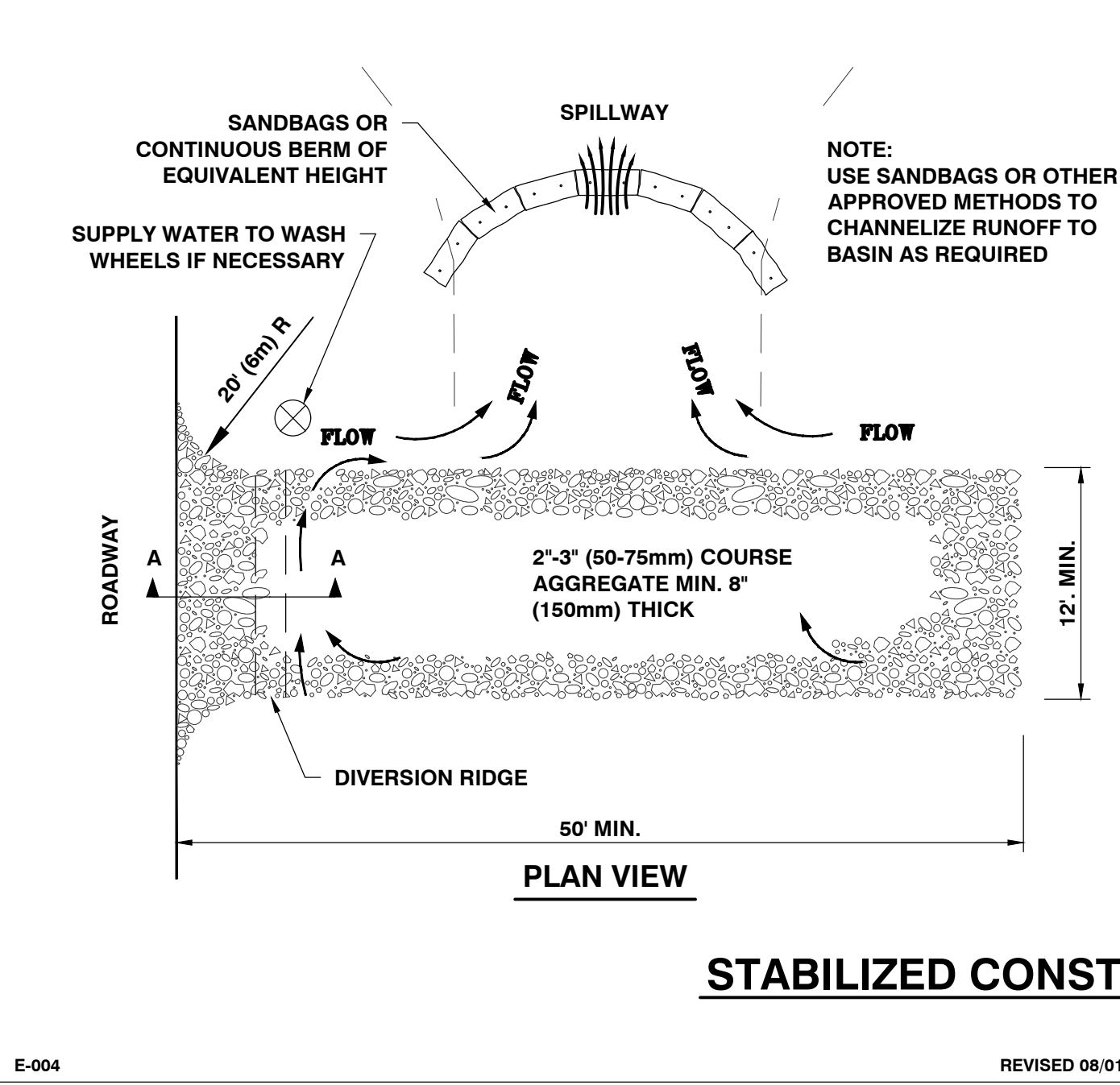
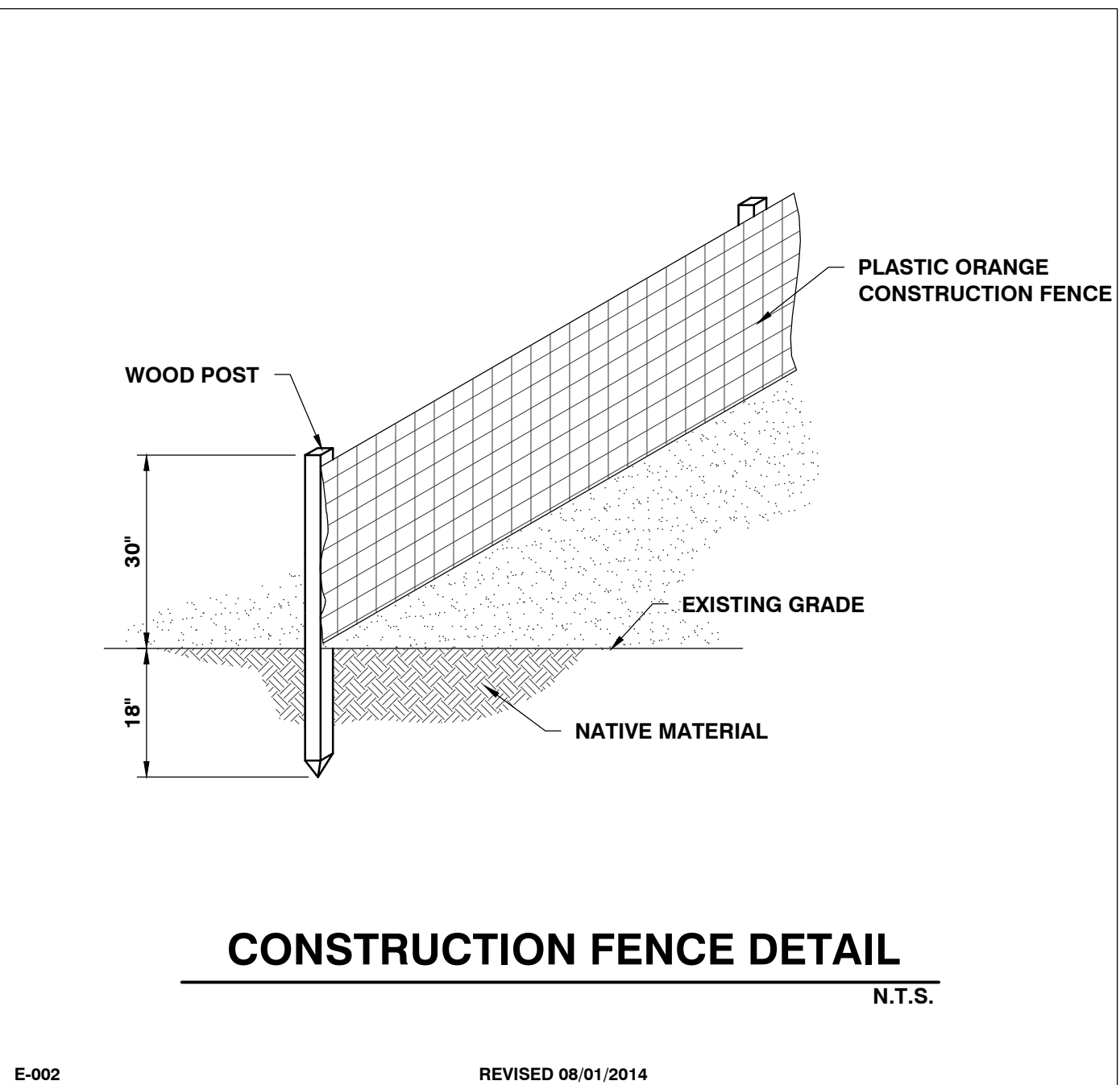
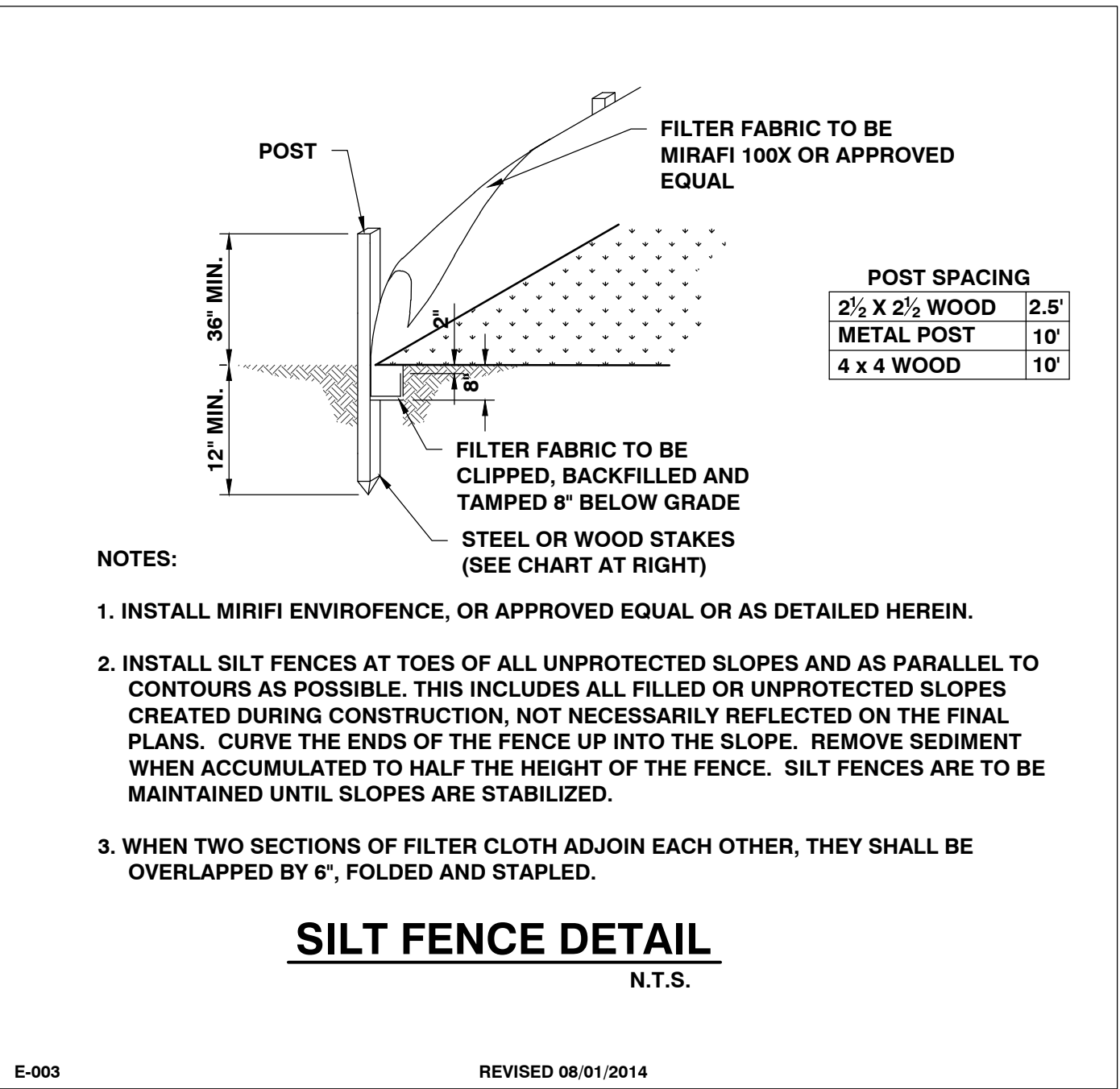
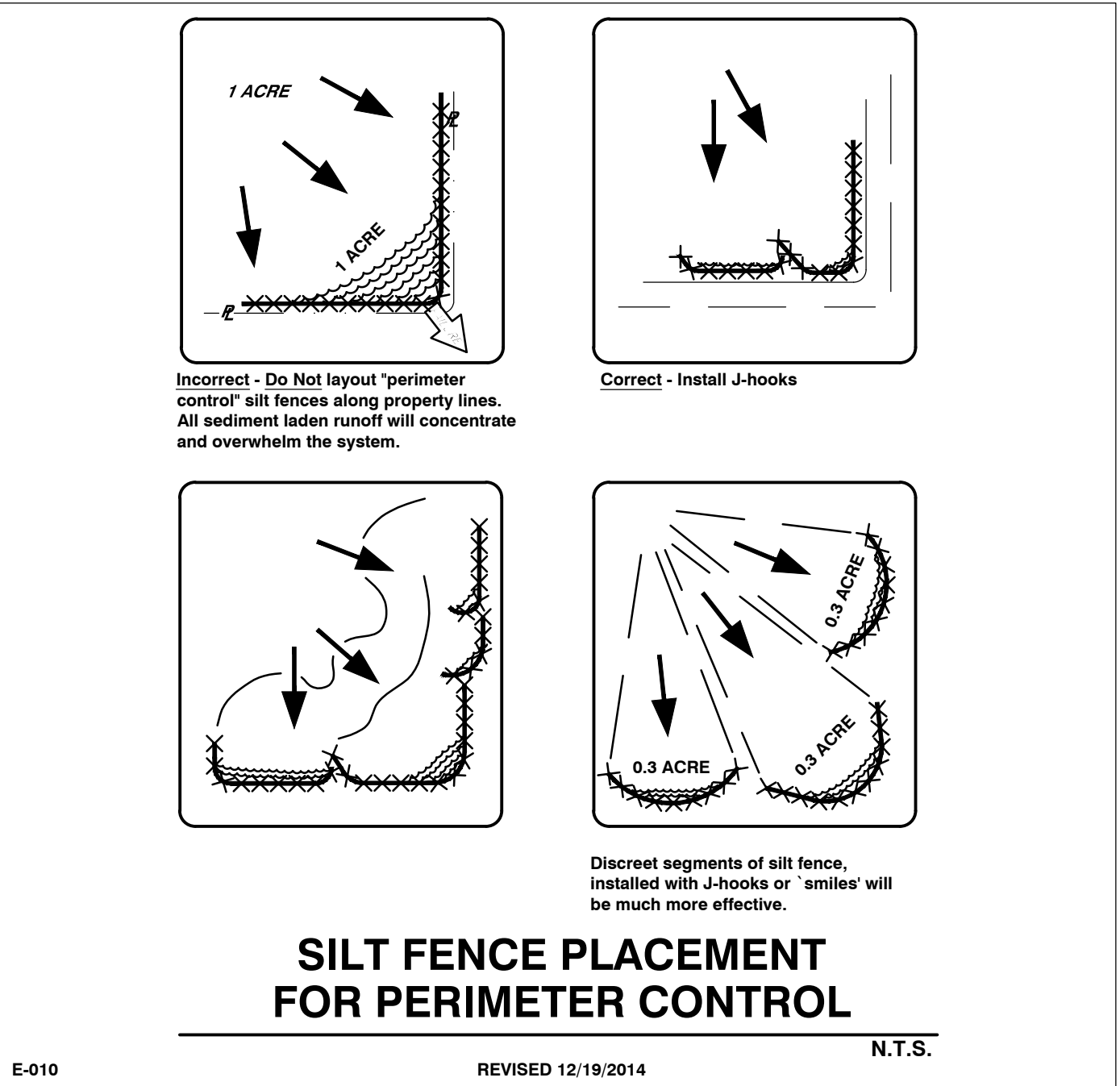
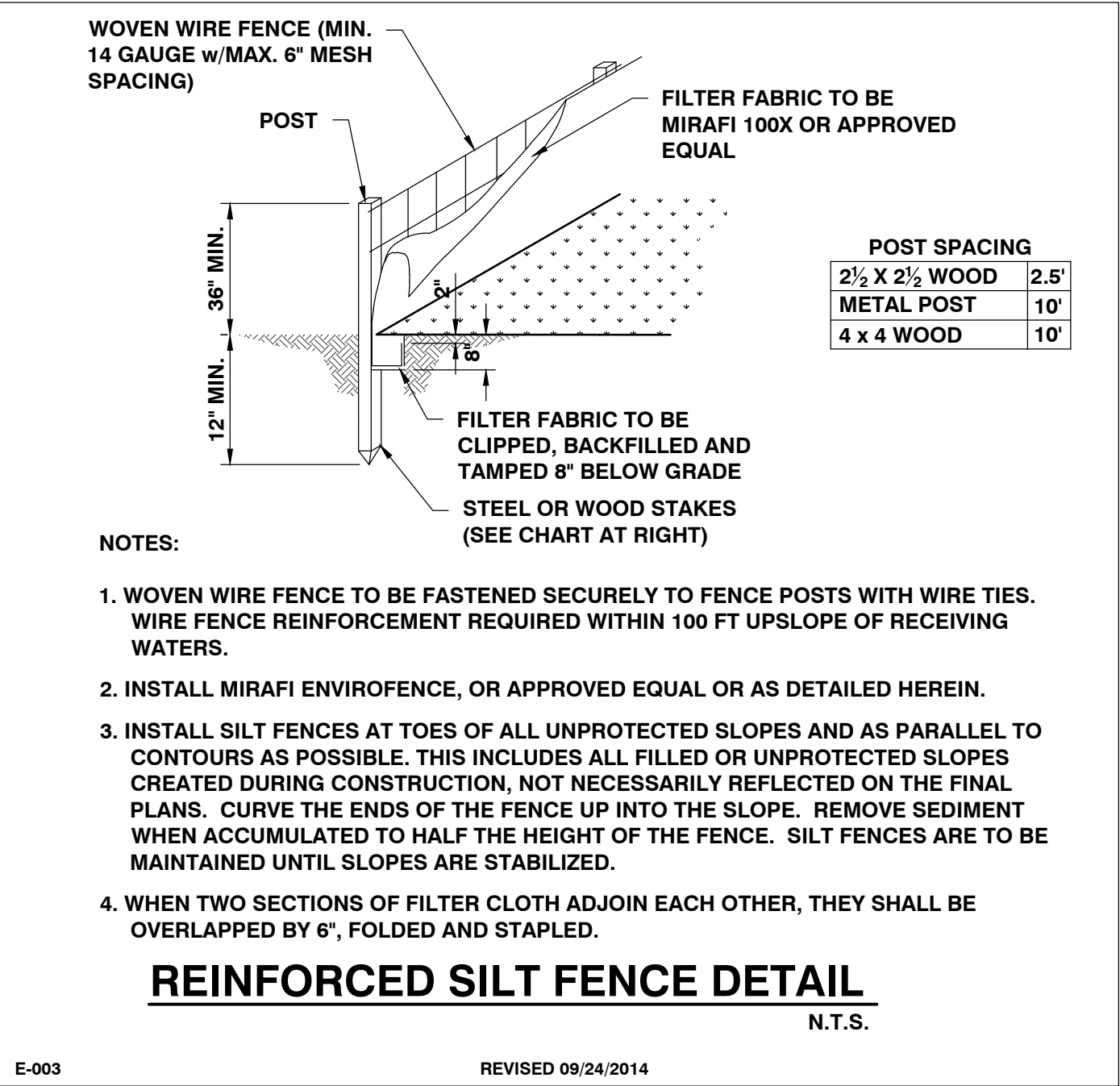
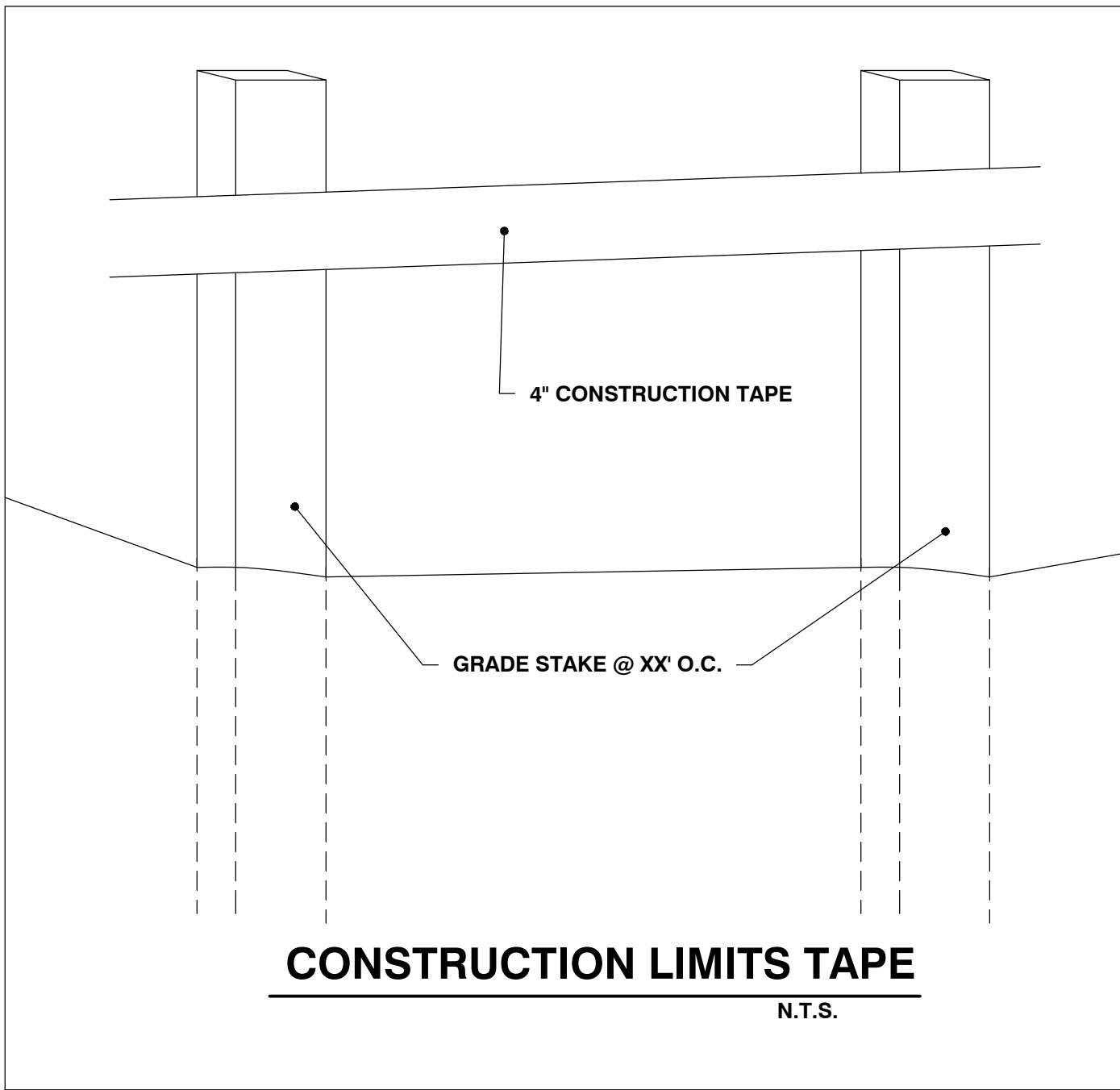
B. Seeded areas will be acceptable provided all installation and maintenance requirements have been complied with and a healthy uniform lawn is established.

C. Upon acceptance, the Owner will assume maintenance.

3.06 WARRANTY

A. All seeded areas will be warranted for a period of twelve months from date of Owner's acceptance. Should any seeded areas fail to maintain full vegetation, failed areas will be refurbished until this specification is achieved at the cost of the Contractor.

END OF SECTION 02936



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05401

PROJECT:

311 NORTH AVE.  
MULTI-USE PATH  
311 NORTH AVE.  
BURLINGTON, VT

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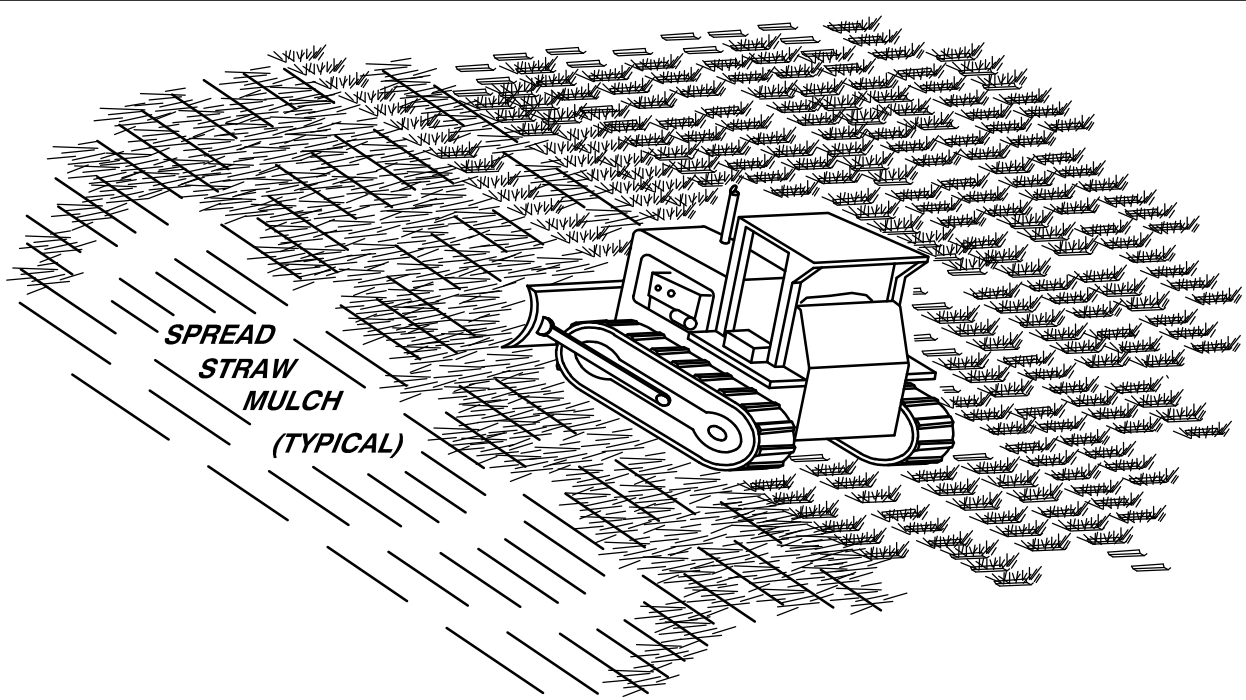
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E-012 Straw Anchoring



NOTES:

1. ROUGHEN SLOPE WITH BULLDOZER.
2. BROADCAST SEED AND FERTILIZER.
3. SPREAD STRAW MULCH 3" (2½ TONS PER ACRE)
4. PUNCH STRAW MULCH INTO SLOPE BY RUNNING BULLDOZER UP AND DOWN SLOPE.

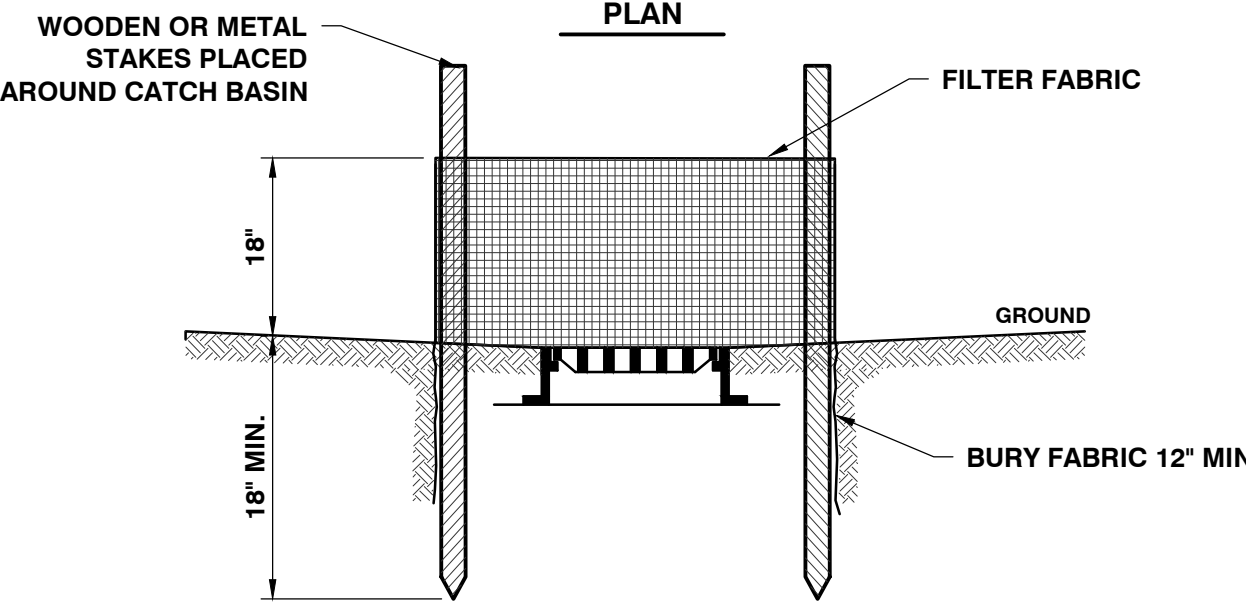
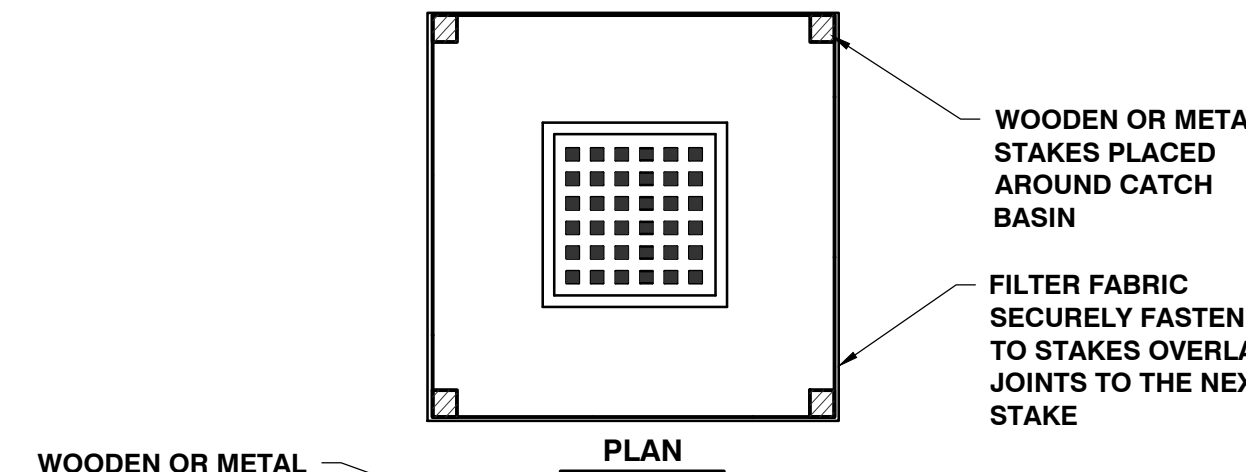
'TRACKING' WITH MACHINERY ON SANDY SOIL PROVIDES ROUGHENING WITHOUT UNDUE COMPACTION.

STRAW ANCHORING

N.T.S.

REVISED 12/19/2014

E-013 Catch Basin Protection

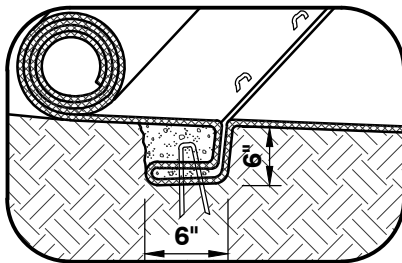
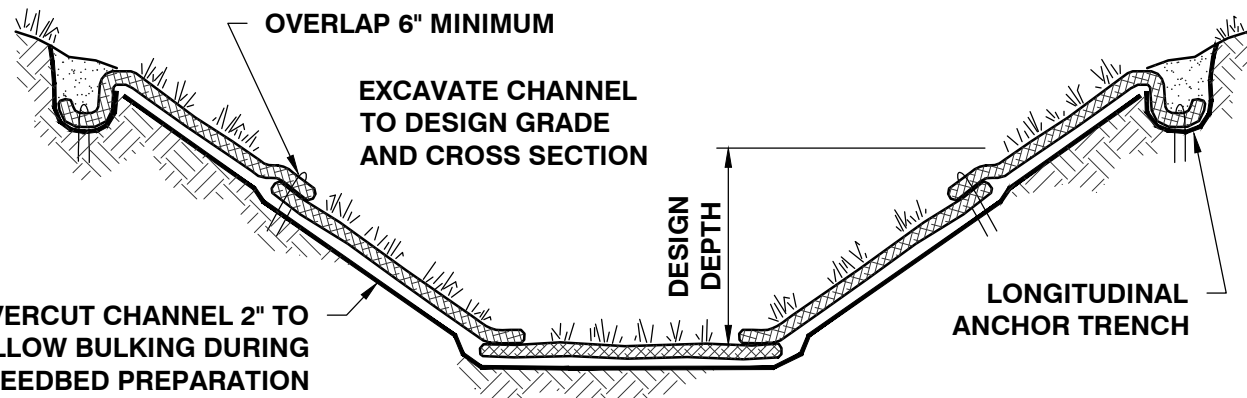


CATCH BASIN INLET PROTECTION  
(W/ FABRIC)

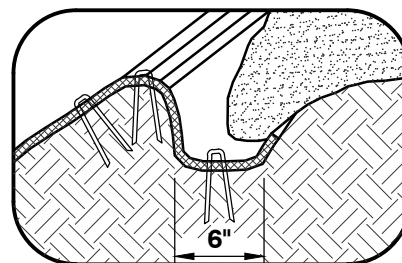
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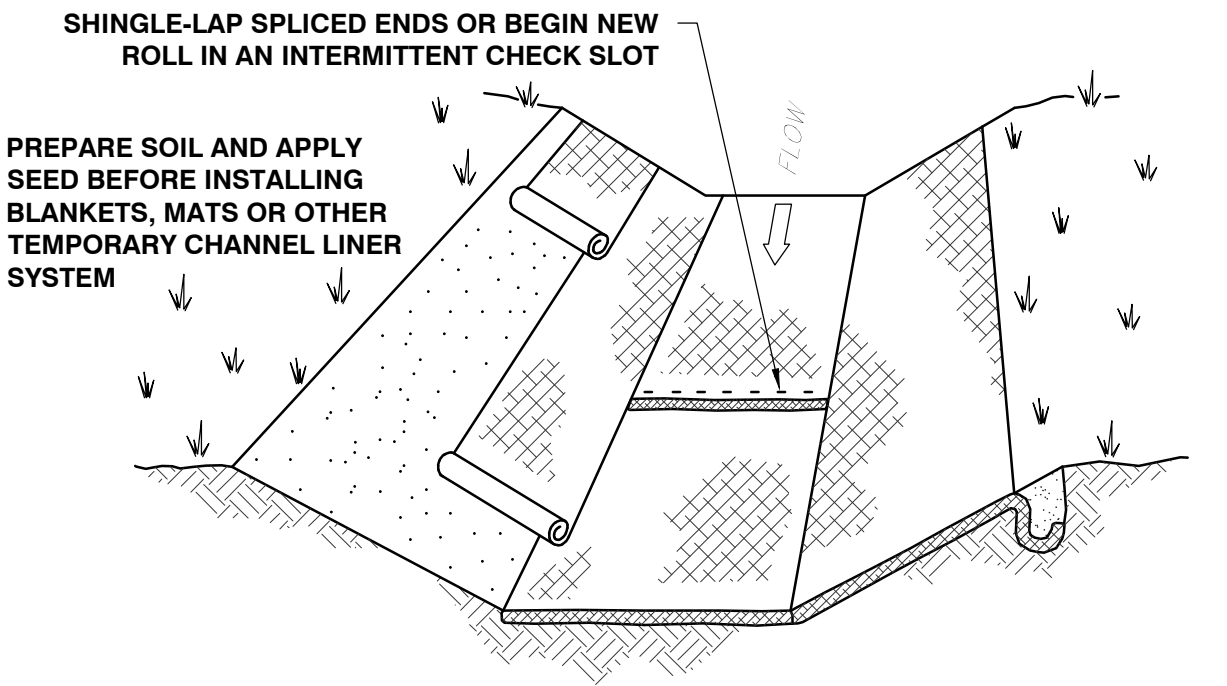
E-011 Grass Lined Channel



INTERMITTENT CHECK SLOT



LONGITUDINAL ANCHOR TRENCH



NOTES:

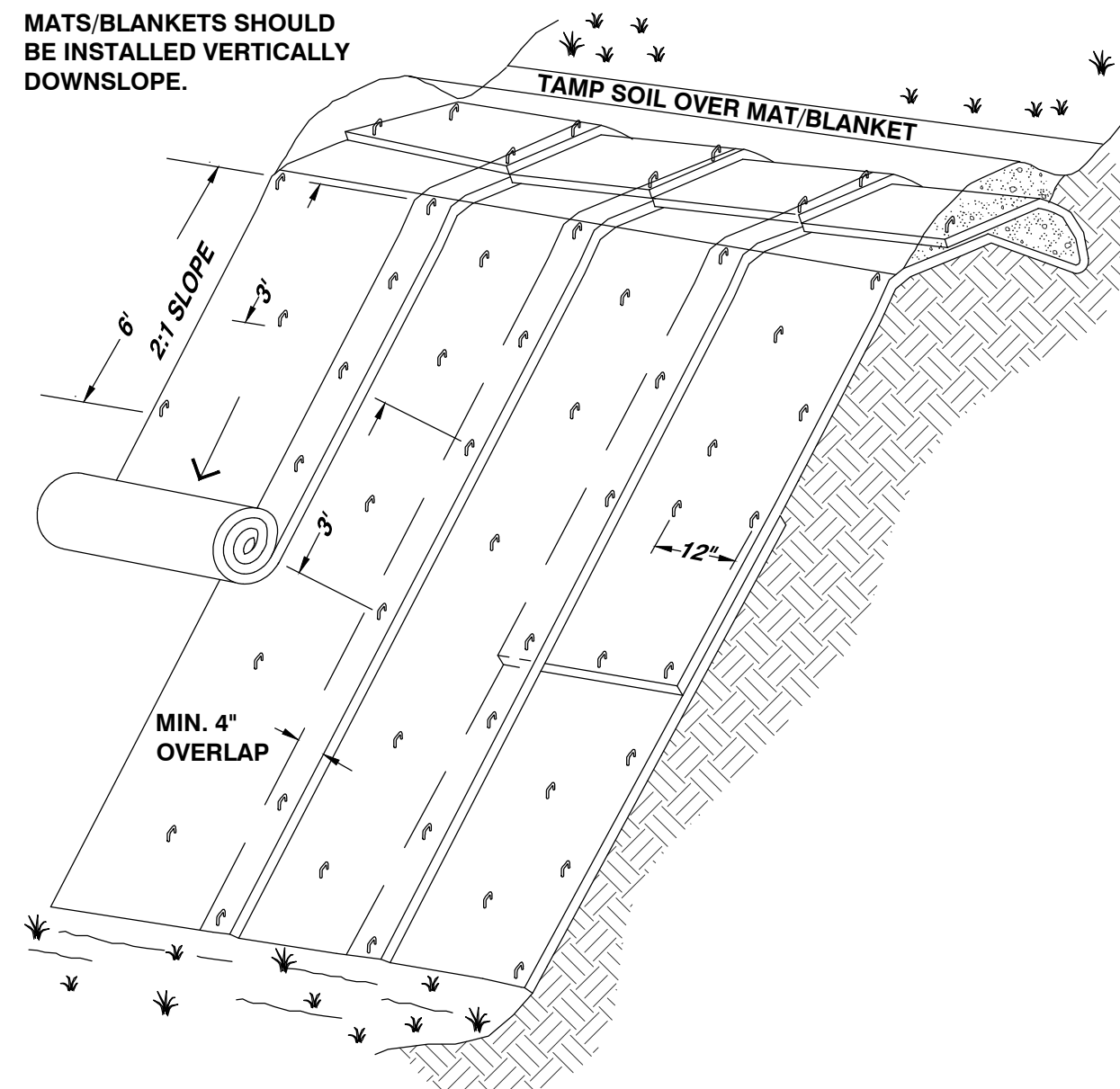
1. DESIGN VELOCITIES EXCEEDING 2 FT./SEC/ REQUIRE TEMPORARY BLANKETS, MATS OR SIMILAR LINERS TO PROTECT SEED AND SOIL UNTIL VEGETATION BECOMES ESTABLISHED.
2. GRASS-LINED CHANNELS WITH DESIGN VELOCITIES EXCEEDING 6 FT./SEC. SHOULD INCLUDE TURF REINFORCEMENT MATS.

GRASS-LINED CHANNEL  
TYPICAL INSTALLATION

N.T.S.

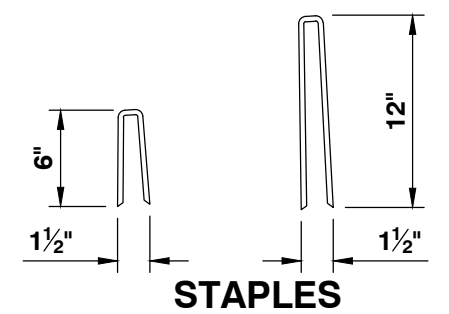
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E-009 Slope Erosion Blankets

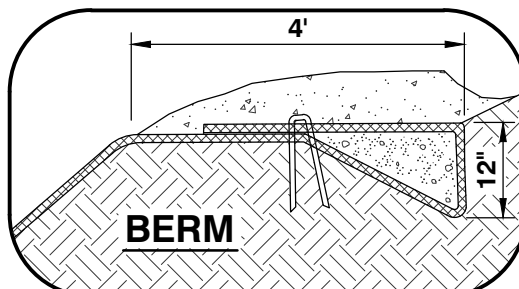


ISOMETRIC VIEW

TYPICAL SLOPE  
SOIL STABILIZATION



STAPLES



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NOTES:

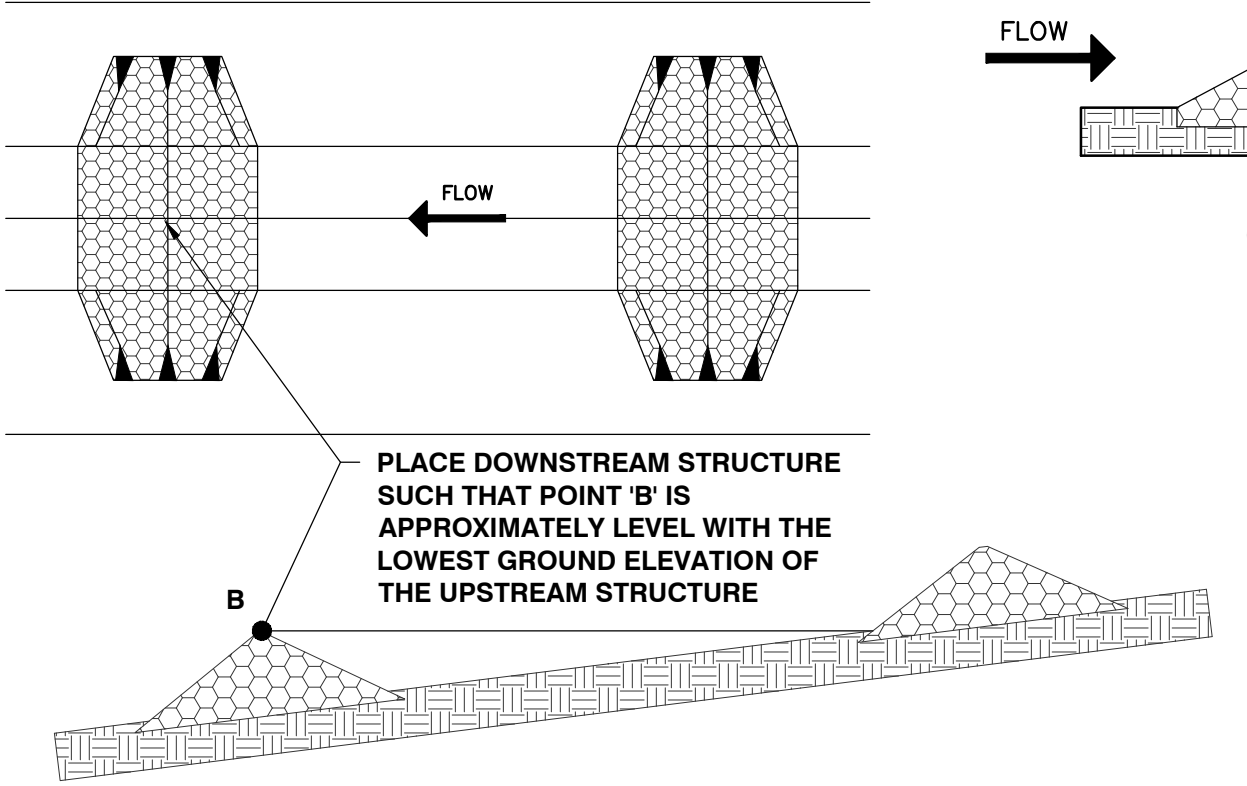
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

EROSION BLANKETS & TURF  
REINFORCEMENT MATS  
SLOPE INSTALLATION

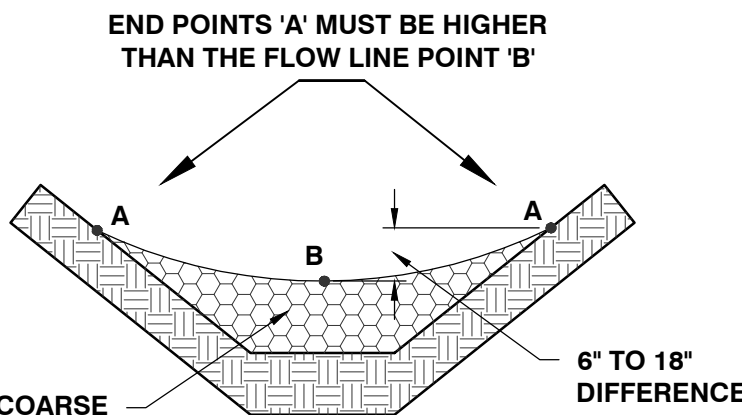
N.T.S.

REVISED 08/01/2014

E-006 Check Dam



SIDE VIEW



FRONT VIEW

| D-50<br>OF ROCK | DOWNSTREAM FLOWLINE SLOPE OF STRUCTURE (m/m) |      |      |      |      |      |
|-----------------|----------------------------------------------|------|------|------|------|------|
|                 | 0.35                                         | 0.30 | 0.25 | 0.20 | 0.15 | 0.10 |
| 3"              | 6"                                           | 7"   | 8"   | 10"  | 13"  | 19"  |
| 6"              | 12"                                          | 14"  | 16"  | 20"  | 27"  | 39"  |

STONE CHECK DAM STRUCTURE

N.T.S.

REVISED 08/01/2014

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PROJECT:

311 NORTH AVE.  
MULTI-USE PATH

311 NORTH AVE.  
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Winter EPSC Requirements

**Introduction** - Rains in late fall, thaws throughout the winter, and spring melt and rains can produce significant flows over frozen and saturated ground, greatly increasing the potential for erosion. At the same time as the erosion risk increases, the "toolbox" available to the contractor and on-site plan coordinator shrinks significantly over this period (Table 3.4 below).

| Table 3.4 Effects of Winter on EPSC Practices |                                                                                                                             |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| EPSC Measure                                  | Effect of Winter Conditions                                                                                                 |
| Vegetative Ground Cover                       | Cannot be established outside of growing                                                                                    |
| Hydroseeding                                  | Stabilizers are poor in cold conditions, poor/no growth of seed over                                                        |
| Diversion Structures                          | Difficult or impossible to implement in frozen soils.                                                                       |
| Sedimentation Basins                          | Must be installed pre-ground freezing. Can be overwhelmed by spring flows                                                   |
| Silt Fence                                    | Difficult to install in frozen ground. Often fail during spring melt.                                                       |
| Erosion Blankets                              | Cannot be installed correctly on frozen ground. Improper installations (not keyed in) melt flows, wash away in melt flows.  |
| Grassed line swales                           | Installation following ground freezing difficult, leaving unprotected concentrated flows with significant erosion potential |
| Impervious Stabilization                      | Paving, other measures cannot be completed in winter                                                                        |

In particular, establishing vigorous vegetation during winter construction is not possible. Based upon the activities anticipated to be undertaken during this period, the Contractor shall plan and implement the following Winter EPSC measures.

EPSC Plan Requirements for -Winter Shutdown-

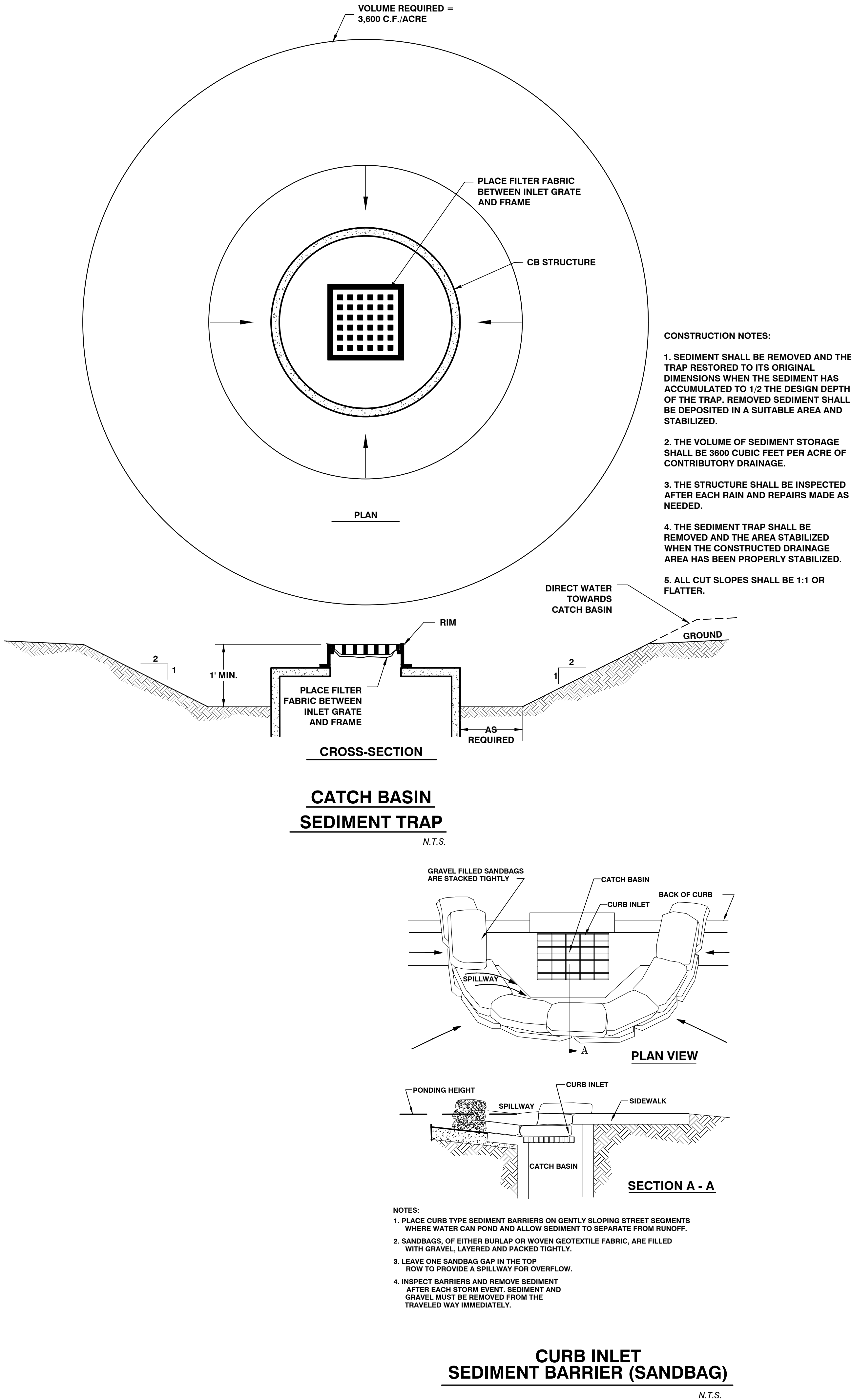
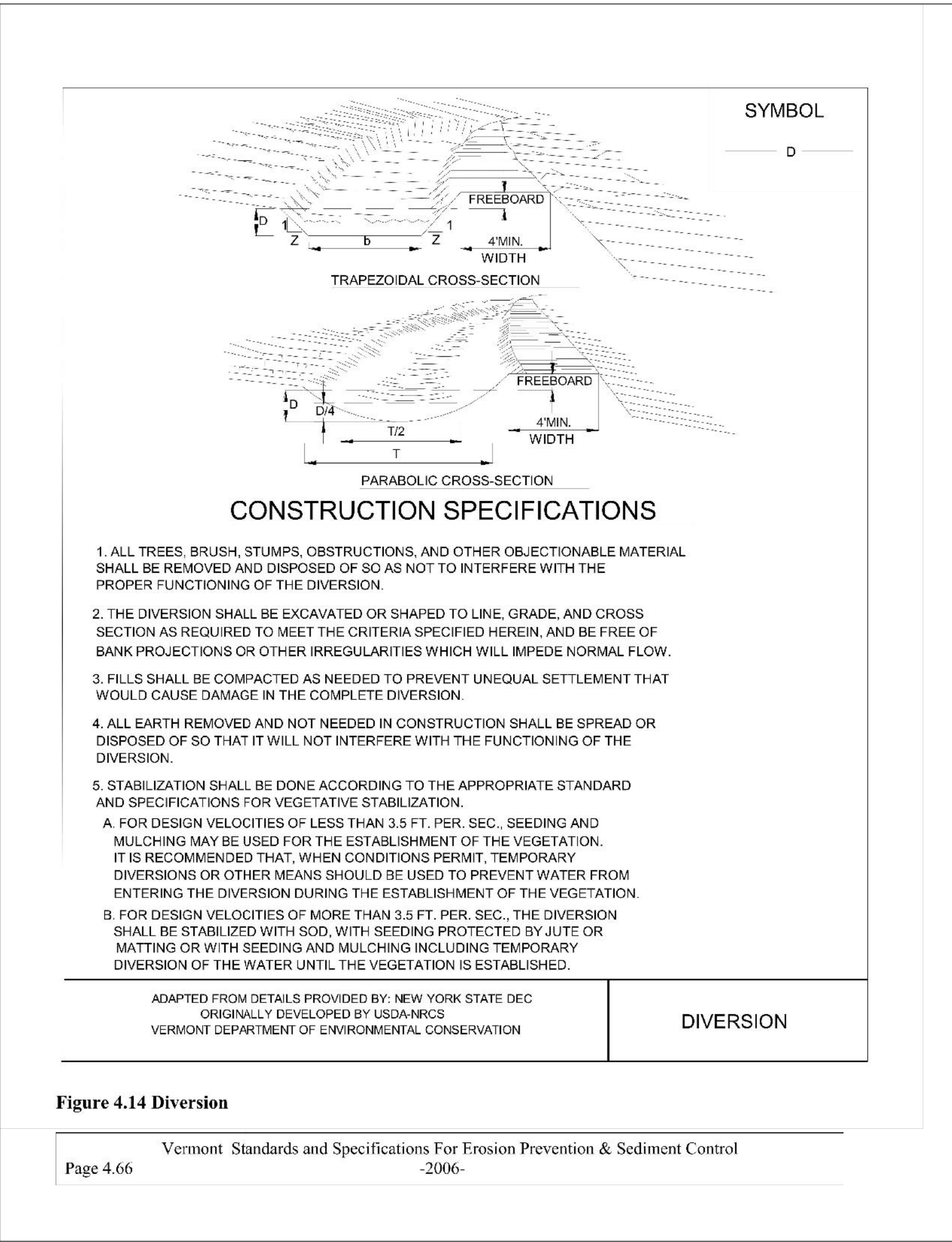
For those projects that will complete earth disturbance activities prior to the winter period (October 15), the following must be implemented by the Site Contractor in coordination with the On-Site Plan Coordinator:

- For areas to be stabilized by vegetation, all seeding shall be completed no later than September 15 to ensure adequate growth and cover.
- Non-vegetative stabilization of all areas of disturbed soils without existing vegetation shall be completed no later than October 15.
- When mulch is used as a temporary means of stabilization, the rate of application shall be double that of the regular construction season rate, or roughly 2 inches of mulch with 80-90% cover. Mulch should be tracked in when weather permits or stabilized with netting or an approved tackifier.

EPSC Plan Requirements for -Winter Construction-

If construction activities involving earth disturbance continue past October 15 or begin before April 15, the following must be implemented by the Owner/Site Contractor:

- Enlarged stabilized access points to provide for snow stockpiling.
- Limits of disturbance flagging moved or replaced to reflect the boundaries of winter work.
- A snow management plan which implements the following requirements:
  - adequate storage and control of snowmelt by diverting these flows around the work area,
  - cleared snow is to be stored down gradient of all areas of disturbance
  - Storage of snow in stormwater treatment structures is prohibited.
  - All drainage structures shall be kept open and free of snow/ice.
  - buffer is to be maintained from the perimeter controls such as silt fence to allow for snow clearing and maintenance.
  - Install silt fence a minimum of 25 feet down gradient of areas of disturbance and snow storage areas. Reinforce fence in areas where snow load forces may be an issue due to site constrictions.
- In areas of disturbance within 100 feet of a receiving water, silt fence shall be reinforced or else replaced with perimeter dikes, swales, or other practices resistant to the forces of snow loads.
- All silt fence and other practices requiring earth disturbance shall be installed ahead of ground freezing.
- Where mulch is the selected stabilization measure, the mulch shall be installed at double the standard rate of mulch, or roughly 2 inches of mulch with 80-90% cover.
- Mulch should be tracked in when weather permits or stabilized with netting or an approved tackifier to prevent removal by wind.
- To ensure cover of disturbed soil in advance of a melt event, areas of disturbed soil must be stabilized at the end of each work day, with the following exceptions:
  - If no precipitation within 24 hours is forecast and work will resume in the same disturbed area within 24 hours, daily stabilization is not necessary.
  - Disturbed areas that collect and retain runoff, such as house foundations or open utility trenches."
- Directions to remove snow or ice to less than 1" thickness prior to temporary or permanent stabilization.
- Stone stabilization shall be installed a width of 10 to 20ft wide around the perimeter of buildings under construction, where construction vehicle traffic is anticipated.



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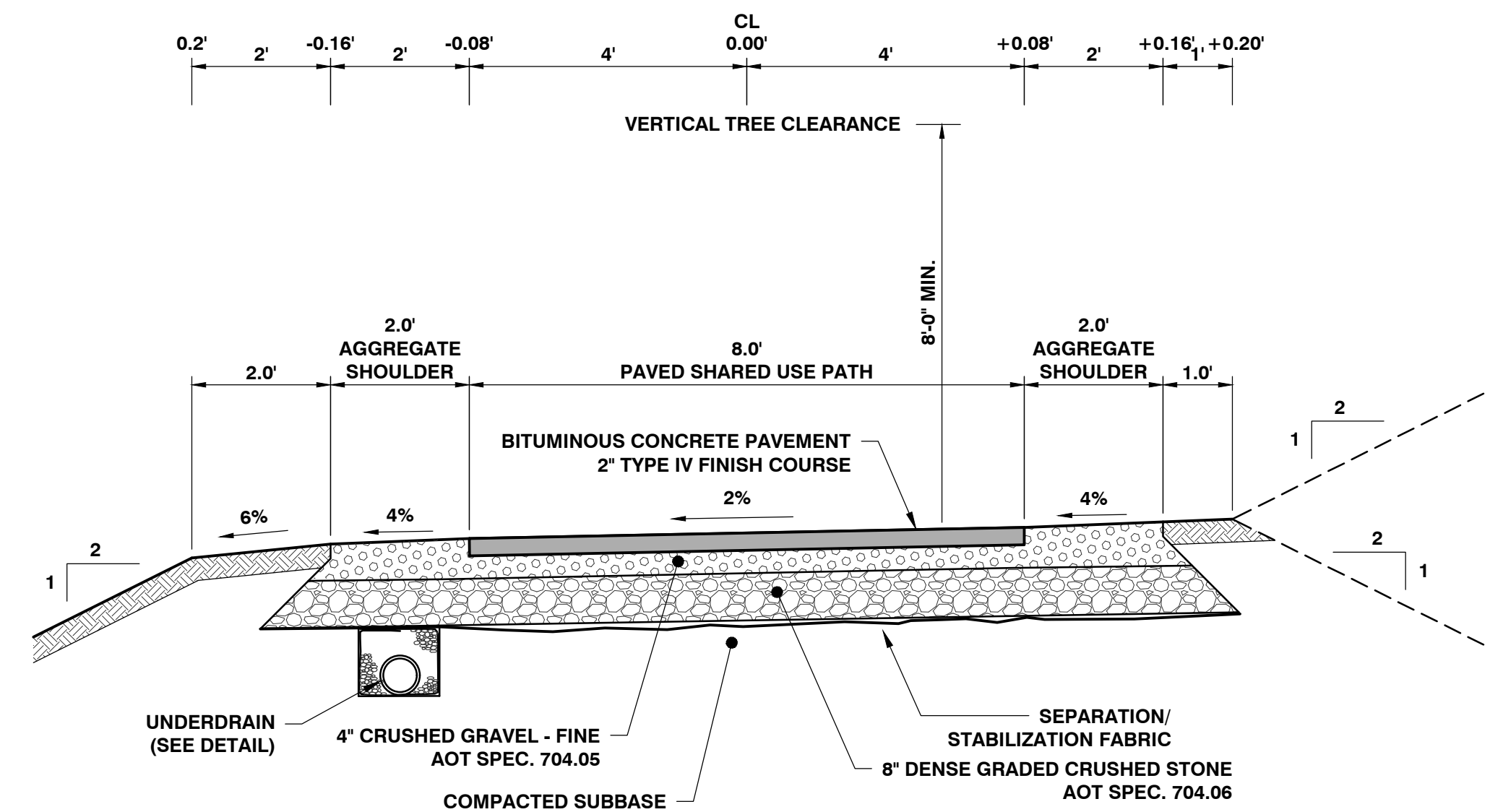
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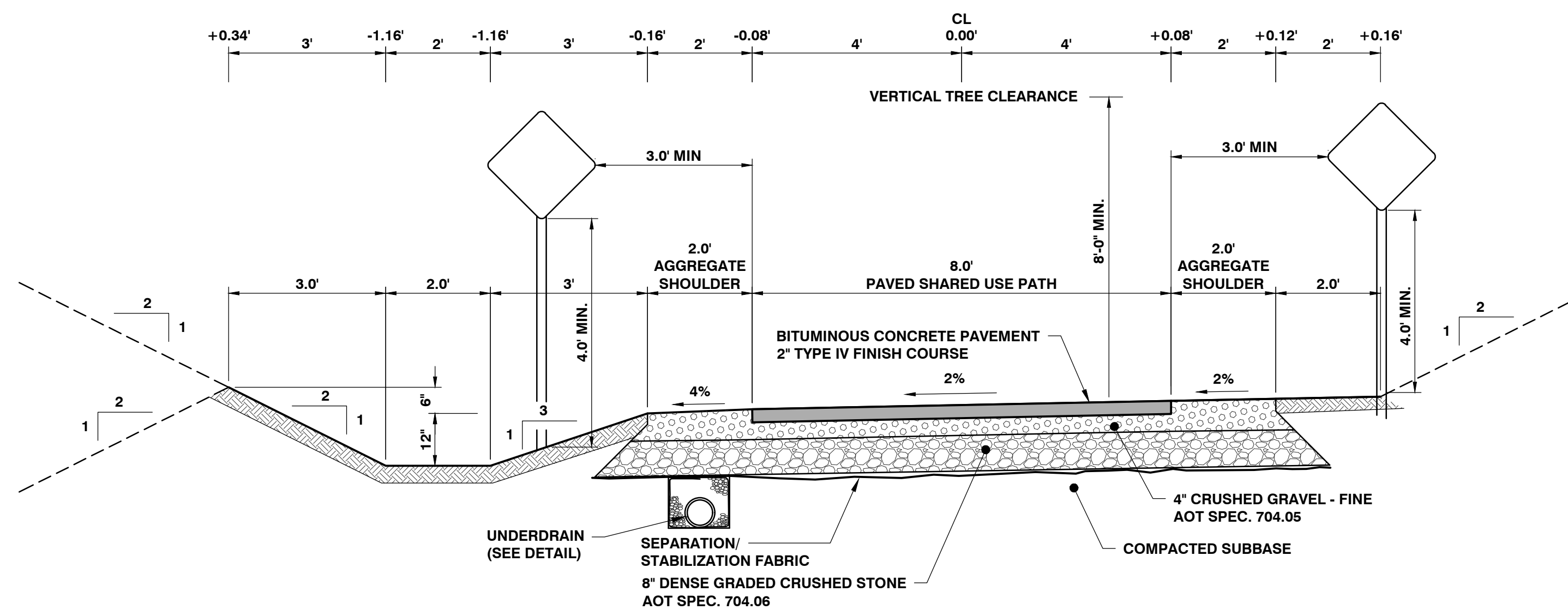


1. THE MINIMUM PAVED PATH WIDTH SHALL BE 8'-0" UNLESS NOTED OTHERWISE ON THE PLANS.
2. THE PATH SHALL HAVE A UNIFORM TWO PERCENT CROSS SLOPE IN THE DIRECTION SHOWN ON THE PLANS, AND THE SUBBASE SHALL BE GRADED TO MATCH.
3. ANY TREE ROOT ENCOUNTERED WITHIN THE EXCAVATION LIMITS SHALL BE PRUNED AND PROTECTED. THE COST OF THIS WORK IS INCIDENTAL TO ITEM 201.10, 'CLEARING AND GRUBBING', INCLUDING INDIVIDUAL TREES AND STUMPS.
4. STONE FILL, TYPE 1, IS REQUIRED ON ANY SLOPE STEEPER THAN 1:2. A 6" LAYER OF GRUBBING MATERIAL OVER THE STONE IS ALSO REQUIRED AND PAID UNDER THE RESPECTIVE UNIT ITEMS.
  - A. ANY SLOPES ADJACENT TO WETLANDS OR STREAMS SHALL USE GRUBBING MATERIAL AS A COVER FOR THE STONE FILL.
  - B. STONE COVERED SLOPES IN DRY AREAS SHALL USE EARTH BORROW AS A COVER MATERIAL. COVER SHALL BE SEEDED AND MULCHED.



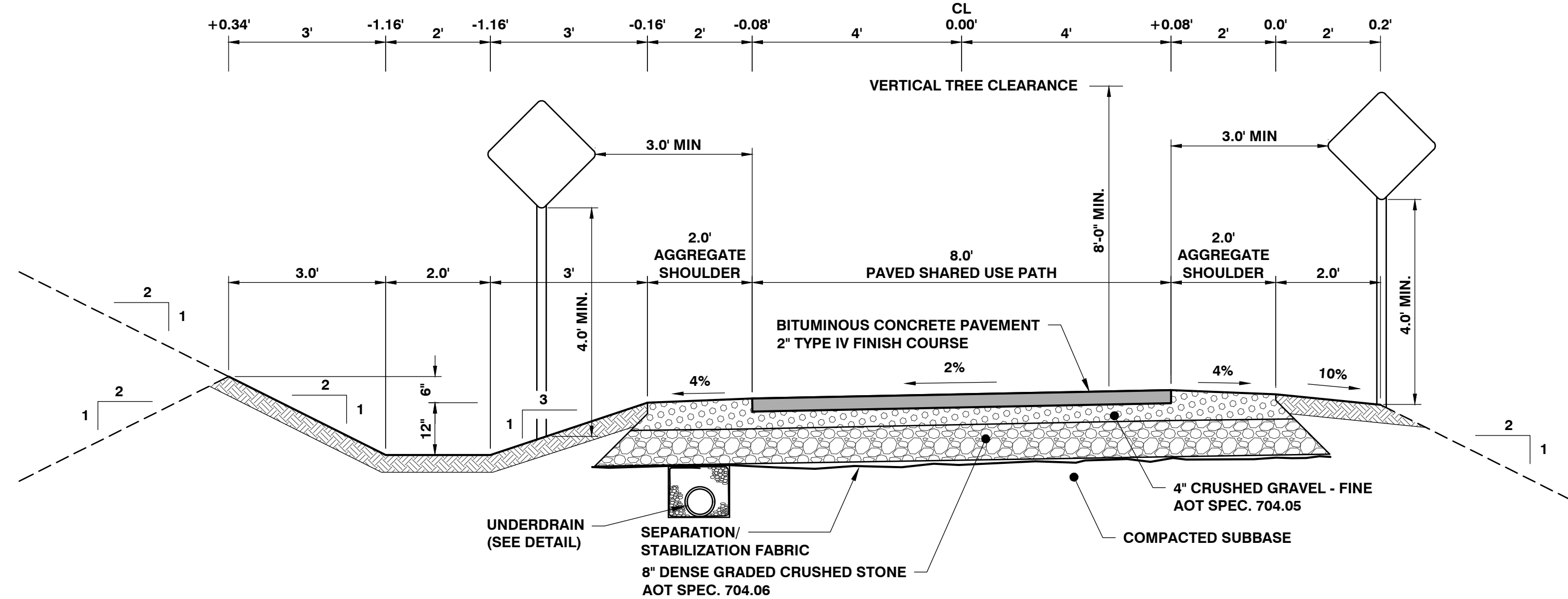
### TYPICAL RECREATION PATH SECTION

**SCALE: 1/2" = 1'-0"**



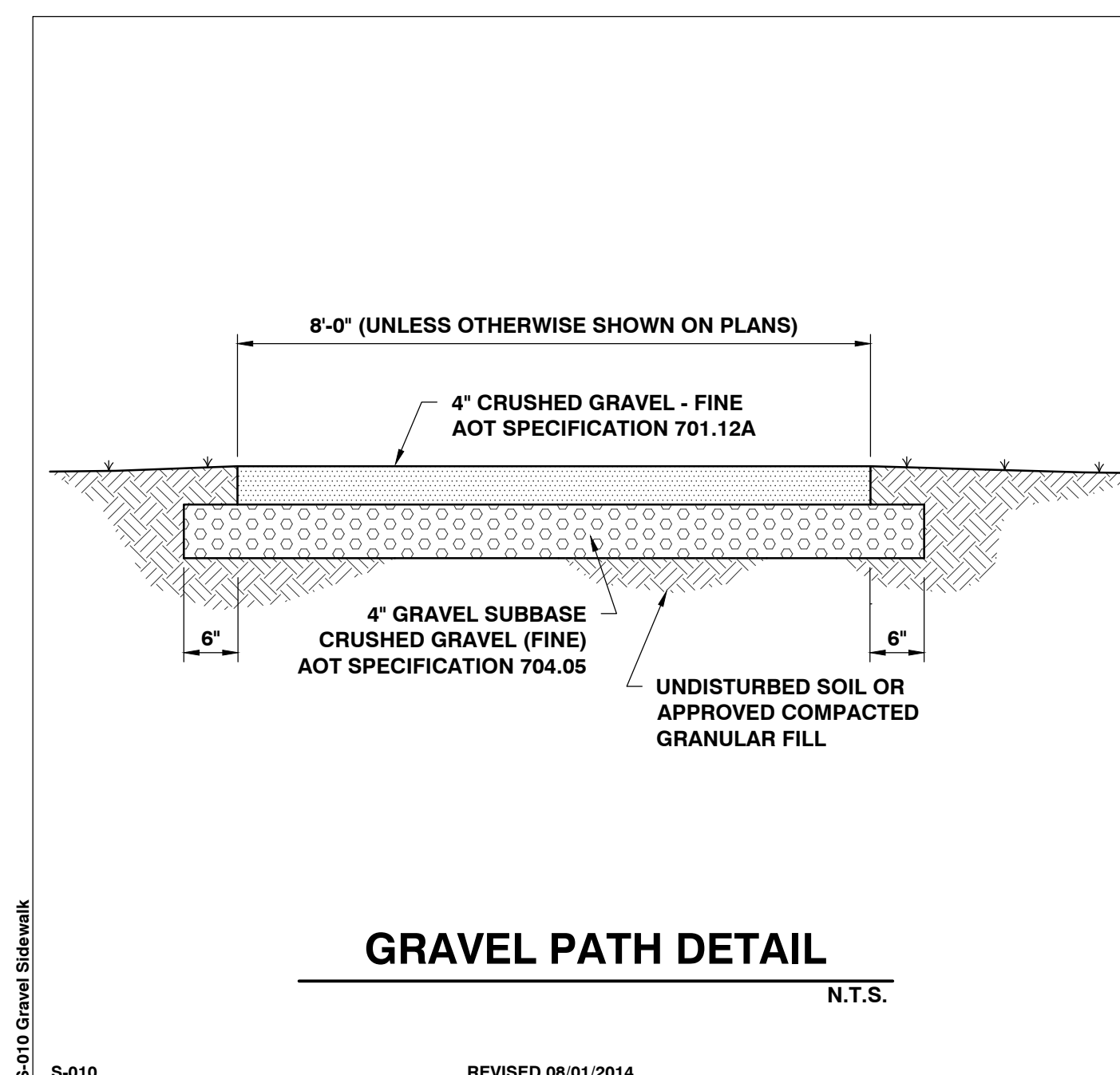
## TYPICAL RECREATION PATH SECTION

**SCALE: 1/2" = 1'-0"**



### TYPICAL RECREATION PATH SECTION

SCALE: 1/2" = 1'-0"



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MULTI-USE PATH

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BURLINGTON, VT

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## DETAILS

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## C4.0







Pipe Installation Conditions-Definitions

Jacked or Tanneled Installation. The pipe is installed without removal of the ground above the pipe. Grouting of the exterior annular space around the pipe may be required to ensure full contact with the soil around the pipe. If existing soil conditions require an oversized tunnel, or if anticipated service conditions require access to the pipeline, a carrier pipe may be installed within the tunnel or casing pipe.

Basis of Design

Representative Soil Type - AASHTO A3 Gravelly Fine Sand - Category 1  
Design Trench/Embankment Installations - Type 4  
Loads - Design loading on the pipe includes Dead (Earth) Load, Live (Railroad) Load and Impact Loads.  
Live (Railroad) load is Cooper E 80. Earth Loads and Cooper E 80 Live Loads from AREMA Design Manual.  
Unit weight of Soil - 120 PCF  
Inside Pipe Diameter - 36 Inches  
Jacked Installation  
Design Depth of Cover - 10 Feet  
Combined Total Load on Concrete Pipe = 2600 PSF AREMA (Chapter 8 Section 10 Table 8-10-2)  
Required Class of Pipe - Class V (Chapter 8 Section 10 Table 8-10-5)

Concrete Pipe

All reinforced concrete pipe shall be bell and spigot pipe with "O" ring gasket or tongue and groove with RAM-NEK type flexible gasket meeting the current ASTM designation C-76 or as specified. Concrete pipe under full width of Railroad R.O.W. shall be Class V.

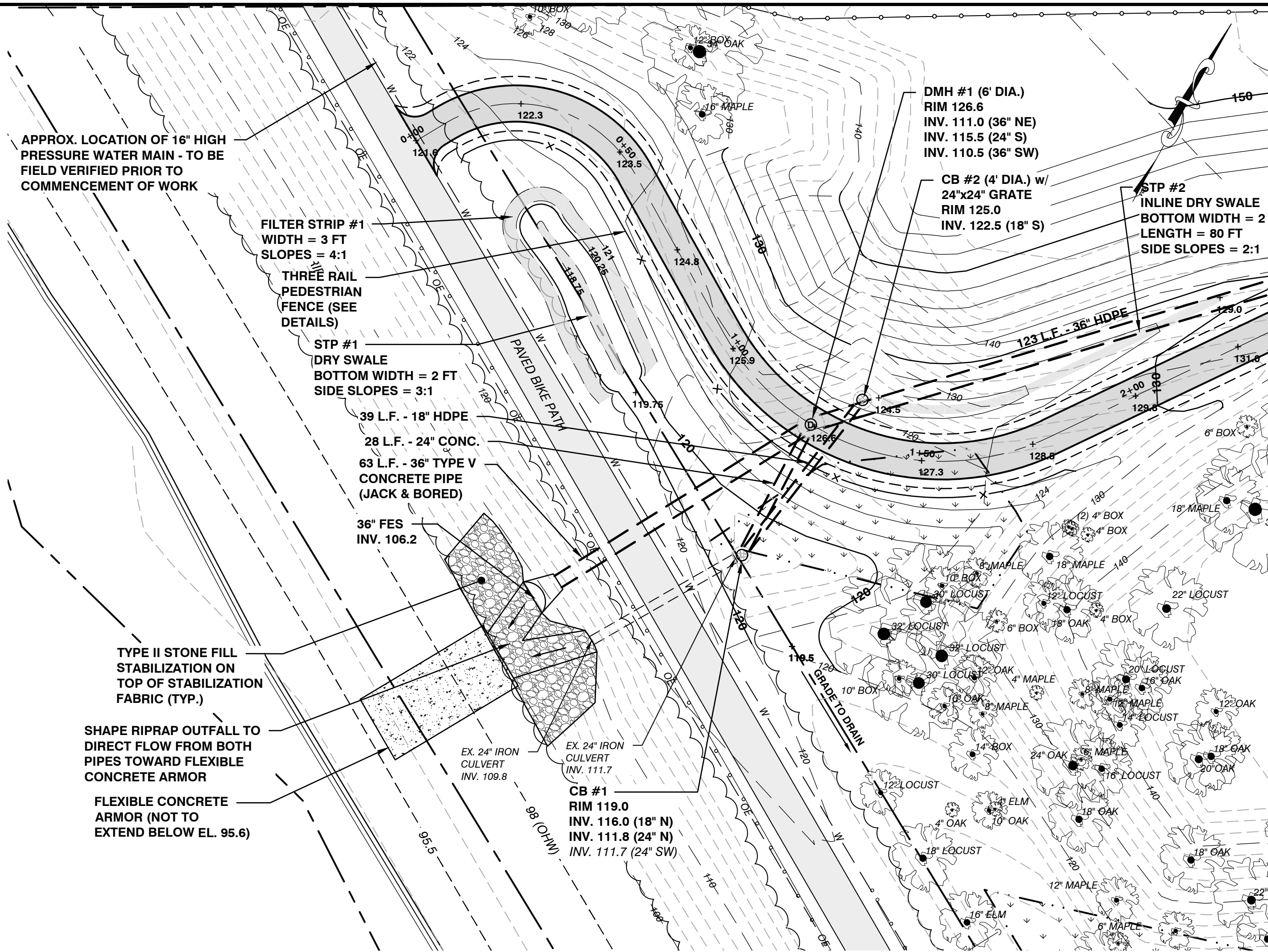
Jacking Pipe

- a) Pipe used for jacking shall form a continuous smooth outside surface when placed in contact with the adjacent pipe. The tongue or spigot shall preferably be at the downstream end. Jacking frames shall be so constructed as to avoid breaking the pipe or forcing it out of alignment. The pipe shall preferably be jacked upgrade in order to provide drainage at the heading during excavation. Satisfactory means shall be provided for maintaining the lead pipe at the correct line and grade.
- b) The pipe shall be installed according to plans and specifications. The contractor's submittal shall document the construction procedure, extra pipe reinforcement, jack shield (if required), jacking pit location, shoring, estimated deformation, track monitoring procedures, and other features for the safe and satisfactory completion of the work. Plans prepared by the contractor giving the construction details shall be submitted to the Engineer for review.
- c) Voids created during jacking operations shall be filled with a suitable grout material. Grout shall be pumped through grout ports integrally cast into the pipe, or drilled after production. Locations shall be recorded after mining is completed.
- d) Monitor elevation and alignment of the road bed above during the jacking procedures. Jacking must be stopped and any problems corrected if road bed movement is detected.



EXISTING CONDITIONS

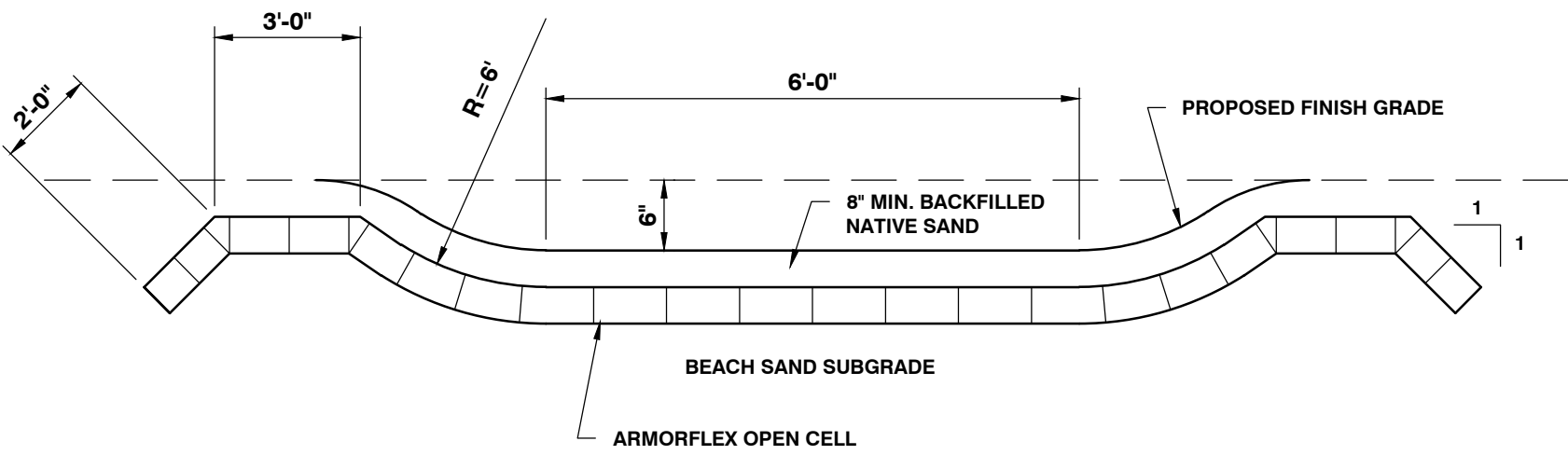
N.T.S.



SITE PLAN

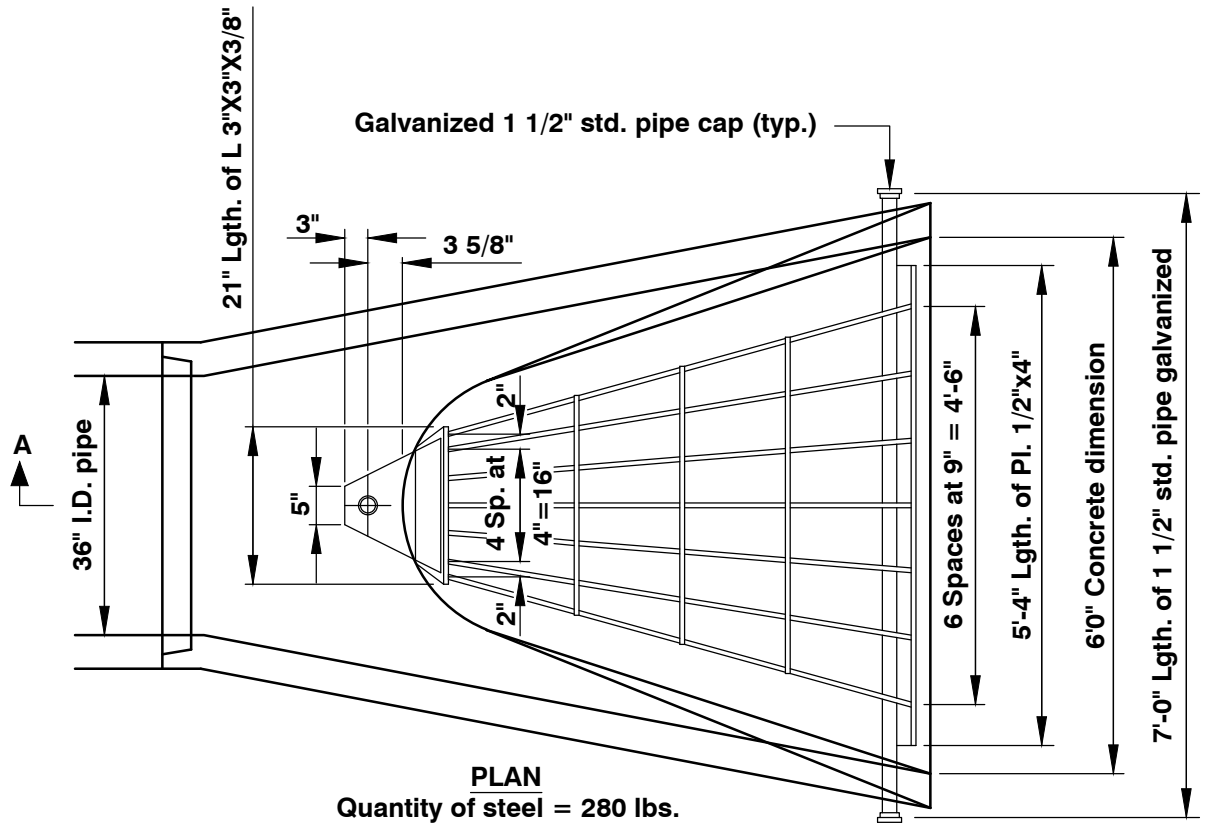
SCALE: 1"=20'

NOTE: ALL WORK WITHIN R.O.W. SHALL BE IN ACCORDANCE WITH AREMA STANDARDS

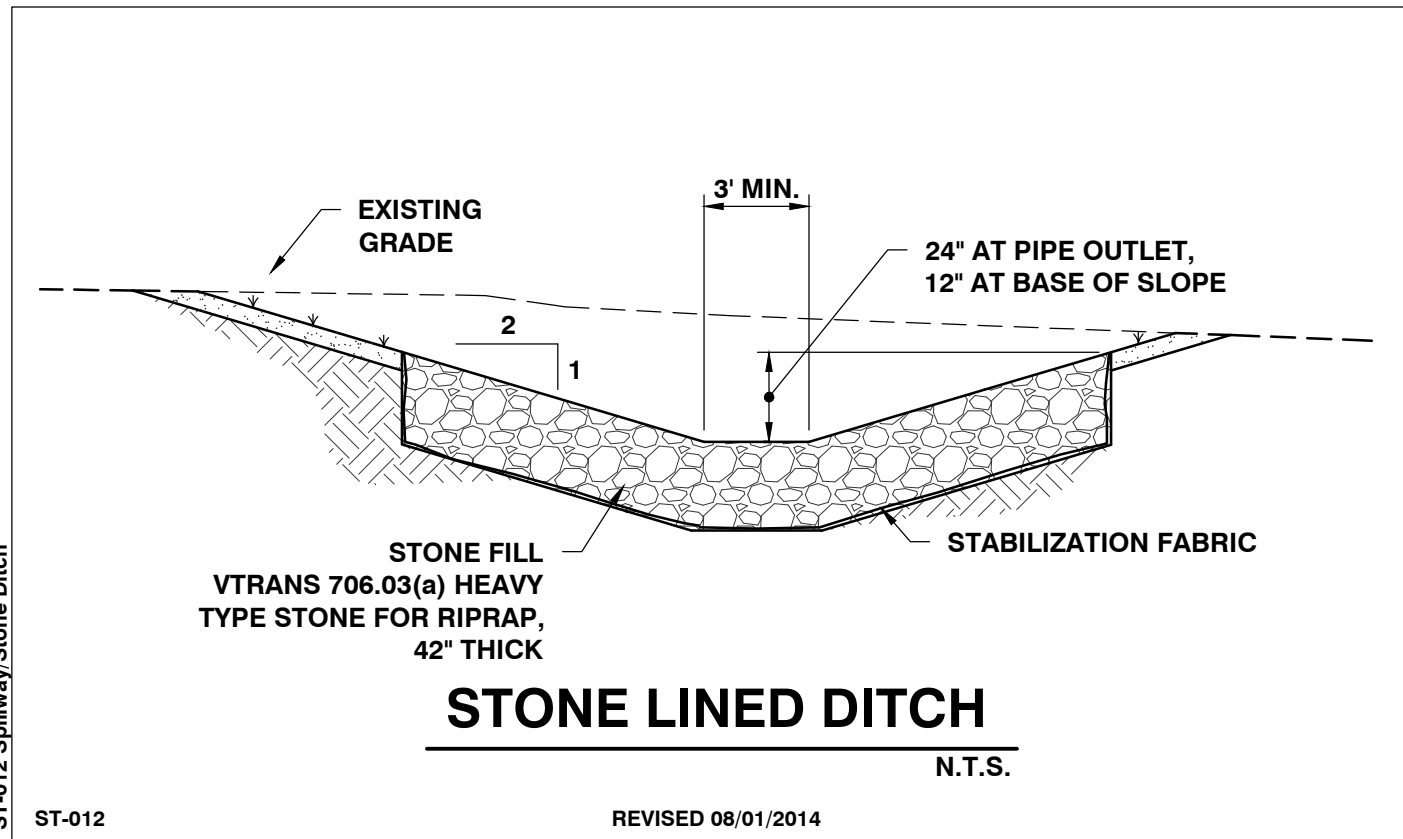


FLEXIBLE CONCRETE ARMOR

N.T.S.



Quantity of steel = 280 lbs.



STONE LINED DITCH

N.T.S.

GENERAL NOTES

Grating details shown are intended for use with particular sizes of precast reinforced concrete flared end sections as shown on standards 542301 and 542306.

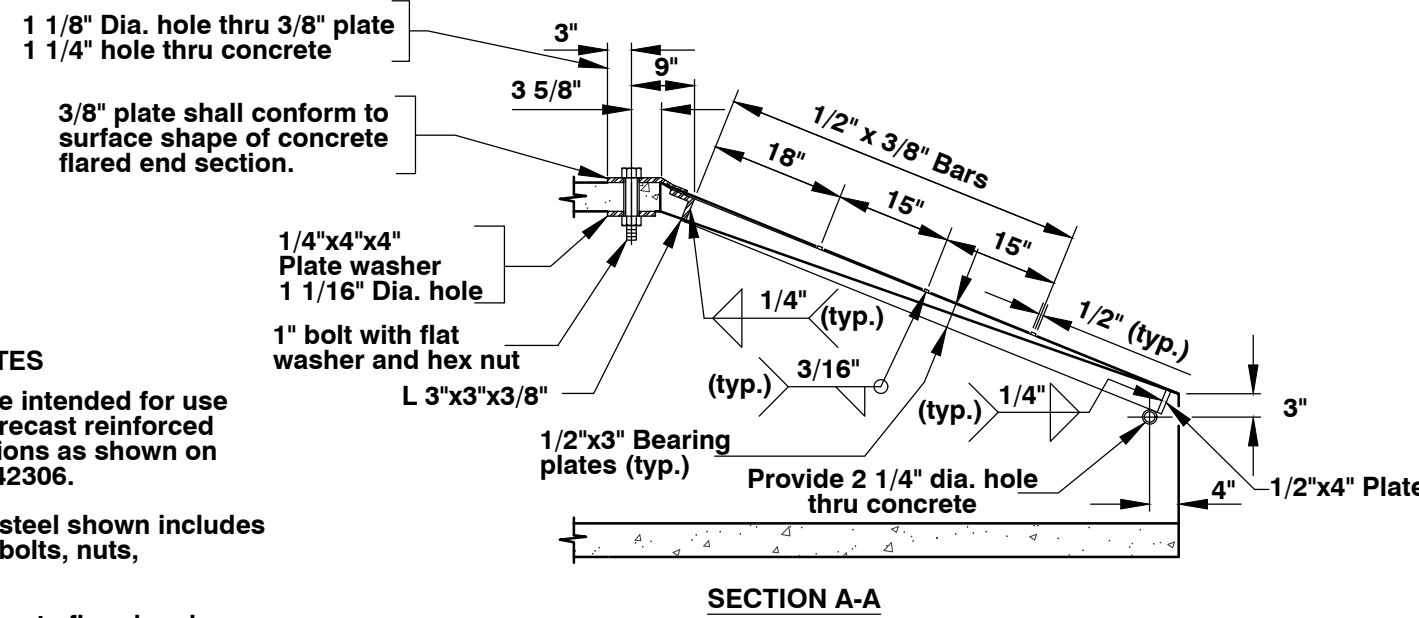
Approximate quantity of steel shown includes total quantity of grating, bolts, nuts, washers and steel pipe.

Holes in the precast concrete flared end sections shall be cored to the diameters noted. If core-out on the other end of the hole occurs, the hole shall be filled with grout to correct the diameter of the hole.

All exposed metal shall be galvanized.

REMOVABLE F.E.S GRATE

N.T.S.



SITE ENGINEER:



CIVIL ENGINEERING ASSOCIATES, INC.  
10 MANSFIELD VIEW LANE, SOUTH BURLINGTON, VT 05403  
802-864-2323 FAX: 802-864-2271 web: www.cea-vt.com

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SAL

CHECKED

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DSM

CLIENT:

BURLINGTON PARKS,  
RECREATION &  
WATERFRONT

645 PINE ST., SUITE B  
BURLINGTON, VERMONT  
05401

PROJECT:

311 NORTH AVE.  
MULTI-USE PATH

311 NORTH AVE.  
BURLINGTON, VT

| DATE    | CHECKED | REVISION                |
|---------|---------|-------------------------|
| 7/19/24 | DSM     | PERMIT REVIEW SUBMITTAL |
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STORM OUTFALL  
DETAILS

DATE

JUL., 2024

SCALE

NONE

PROJ. NO.

18118

DRAWING NUMBER

C4.2



PROJECT COORDINATION    UPDATED 8/5/16

PART 1 – GENERAL

1.01 MEETINGS & PROJECT ACCESS

- A. The Owner shall be notified five (5) days prior to commencement of Work by the Contractor.
- B. The Contractor will coordinate with the Owner to arrange an on-site pre-construction meeting prior to commencement of any work. Job superintendents and subcontractors shall be included in this meeting.
- C. The Contractor will coordinate all phases of the Work, so as not to interfere with the normal work procedures in the area.
- D. The Contractor shall conduct his work in such a manner as to not interfere with or endanger work or traffic in areas adjacent to the construction area, except as permitted by the Owner. The Contractor shall so arrange his construction operations as to provide access for emergency vehicles and equipment to the work site at all times.

1.02 LABOR

- A. The Contractor and subcontractors will employ mechanics skilled in their respective trades.
- B. All labor will be performed in a neat and workmanlike manner.

1.03 PROTECTION OF PERSONS AND PROPERTY

- A. The Contractor shall be responsible for initiating, maintaining, and supervising all O.S.H.A. safety precautions in connection with the Work.
- B. Fire Protection: The Contractor shall take all necessary precautions to prevent fires adjacent to the Work and shall provide adequate facilities for extinguishing fires. The Contractor shall also prevent fires in project related buildings and shall prevent the spread of fires to areas outside the limits of the Work.
- C. Safety Precautions: Prior to commencement of Work, the Contractor shall be familiar with all safety regulations and practices applicable with construction operations. No additional payments will be made for equipment and procedures necessitated by these safety precautions.

1.04 CORRECTION OF WORK

- A. The Contractor shall promptly correct all Work rejected by the Owner as defective or as failing to conform to the Contract Documents. The Contractor shall bear all cost of correcting such rejected Work.

1.05 WEATHER CONDITIONS

- A. No Work shall be done when, in the opinion of the Owner, the weather is unsuitable. No concrete, earth backfill, embankment, or paving shall be placed upon frozen material. If there is delay or interruption in the Work due to weather conditions, the necessary precautions must be taken to bond new Work to old.
- B. Protection Against Water and Storm: The Contractor shall take all precautions to prevent damage to the Work by storms or by water entering the site of the Work directly or through the ground. In case of damage by storm or water, the Contractor, at his own expense, shall make repairs or replacements or rebuild such parts of the Work as the Engineer may require in order that the finished work may be completed as required by the Drawings and Specifications.

1.06 DISPOSAL OF DEBRIS

- A. All debris and excess materials, other than that which is authorized to be reused, become the property of the Contractor and shall be promptly removed from the property. The Contractor shall receive title to all debris and/or excess material. The Owner will not be responsible for any loss or damage to debris or excess material owned by the Contractor.

1.07 PROJECT LAYOUT

- A. The Contractor shall be responsible for providing all necessary survey staking.
1. Locate and protect control points before starting work on the site.
2. Preserve permanent reference points during progress of the Work.
3. Establish a minimum of two permanent benchmarks on the site, referenced to data established by survey control points.
- a. Record locations, with horizontal and vertical data, on Project Record Documents.

1.08 TESTING

- A. The Contractor is responsible for obtaining testing and inspection services.

SITE CLEARING

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes:

1. Remove surface debris.
2. Clear site of plant life and grass.
3. Remove trees and shrubs.
4. Remove root system of trees and shrubs.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.01 PROTECTION

- A. Protect utilities that remain from damage.
- B. Protect trees, plant growth, and features designated to remain as final landscaping.
- C. Protect bench marks and existing structures from damage or displacement.
- D. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
- E. Maintain access to the site at all times.

3.02 CLEARING

- A. Clear areas required for access to site and execution of Work.
- B. Remove trees and shrubs within marked areas. Remove stumps, roots and tap roots and other projections 1½" or greater in diameter to 2'-0" below the excavated surfaces in cut areas and 2'-0" below the exposed subgrade in fill areas.

3.03 REMOVAL

- A. Remove debris, rock, and extracted plant life from site.
- B. The Contractor shall coordinate Work with the Engineer and Owner in establishing suitable areas within the property limits for depositing debris, rocks and extracted plant life. The Contractor shall be responsible for backfilling (capping) and grading all waste sites.

3.04 UTILITIES

- A. Coordinate with utility companies and agencies as required.

SITE EARTHWORK

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes:

1. All excavation (unless covered in other sections of these specifications), removal and stockpile of topsoil, stabilization fabric, and other miscellaneous and appurtenant works.
2. Site filling.
3. Roadway structural sections.

1.02 PROTECTION

- A. Protect bench marks and existing structures.
- B. Protect above or below grade utilities which are to remain.

1.03 SUBMITTALS

- A. Testing laboratory reports indicating that material for backfill meets requirements of this Section.
- B. Field density test reports of site fill in place.
- C. Field density test reports for roadway structural sections in place.
- D. Stabilization Fabric: Submit copies of manufacturer's specifications and installation instructions.

PART 2 – PRODUCTS

2.01 STRUCTURAL FILL – CRUSHED GRAVEL (AOT SPEC. 704.05, FINE)

- A. All materials shall be secured from approved sources. This gravel shall consist of angular and round fragments of hard durable rock of uniform quality throughout, reasonably free from thin elongated pieces, soft or disintegrated stone, dirt, organic or other objectionable matter. This material shall meet the following grading requirements:

| <u>Sieve Designation</u> | <u>Percent by Weight<br/>Passing Square Mesh Sieve</u> |
|--------------------------|--------------------------------------------------------|
| 2"                       | 100                                                    |
| 1 1/2"                   | 90 – 100                                               |
| No. 4                    | 30 – 60                                                |
| No. 100                  | 0 – 12                                                 |
| No. 200                  | 0 – 6                                                  |

2.02 CRUSHED GRAVEL (AOT SPEC. 704.05, COARSE)

- A. This material shall meet the following grading requirements:

| <u>Sieve Designation</u> | <u>Percent by Weight<br/>Passing Square Mesh Sieve</u> |
|--------------------------|--------------------------------------------------------|
| 4"                       | 95 – 100                                               |
| No. 4                    | 25 – 50                                                |
| No. 100                  | 0 – 12                                                 |
| No. 200                  | 0 – 6                                                  |

At least 50% by mass (weight) of the material coarser than the No. 4 sieve shall have at least one fractured face.

2.03 COMPACTED FILL/GRANULAR BORROW

- A. This material shall be free of shale, clay, friable material, debris, and organic matter, graded in accordance with ANSI/ASTM C136 within the following limits:

| <u>Sieve Designation</u> | <u>Percent by Weight<br/>Passing Square Mesh Sieve</u> |
|--------------------------|--------------------------------------------------------|
| 3"                       | 100                                                    |
| ¾"                       | 75 – 100                                               |
| No. 4                    | 20 – 100                                               |
| No. 100                  | 0 – 20                                                 |
| No. 200                  | 0 – 6                                                  |

2.04 DRAINAGE COURSE (AOT SPEC. 704.16)

- A. Rock for drainage applications shall be produced from natural gravels or crushed quarried rock and shall consist of clean, hard, sound, and durable material. It shall be obtained from approved sources and shall meet the following grading requirements:

| <u>Sieve Designation</u> | <u>Percent by Weight<br/>Passing Square Mesh Sieve</u> |
|--------------------------|--------------------------------------------------------|
| 1"                       | 100                                                    |
| ¾"                       | 90 – 100                                               |
| ¾"                       | 20 – 55                                                |
| No. 4                    | 0 – 10                                                 |
| No. 8                    | 0 – 10                                                 |

2.5. DENSE GRADED CRUSHED STONE

- A. Dense Graded Crushed Stone should consist of a well graded crushed run stone and should meet the requirements for Vermont AOT Standard Specifications Item 704.06 Dense Graded Crushed Stone for Subbase and the gradation requirements shown in Table 704.06A of the Vermont AOT Standard Specifications.

| <u>Sieve Designation</u> | <u>Percent Finer by Weight</u> |
|--------------------------|--------------------------------|
| 3½"                      | 100                            |
| 3"                       | 90 – 100                       |
| 2"                       | 75 – 100                       |
| 1½"                      | 50 – 80                        |
| 1"                       | 30 – 60                        |
| No. 4                    | 15 – 40                        |
| No. 200                  | 0 – 6                          |

2.1. RECYCLED ASPHALT PAVEMENT (RAP) 1½" MINUS CRUSHED ASPHALT

- A. This material shall be free of Portland Cement and approved by the engineer prior to installation. This material shall not be mixed with gravel and shall meet the following grading requirements:

| <u>Sieve Designation</u> | <u>Percent by Weight<br/>Passing Square Mesh Sieve</u> |
|--------------------------|--------------------------------------------------------|
| 2"                       | 100                                                    |
| 1½"                      | 90 – 100                                               |
| No. 4                    | 30 – 60                                                |
| No. 100                  | 0 – 12                                                 |
| No. 200                  | 0 – 6                                                  |

2.6 SAND BORROW AND CUSHION

- A. Sand Borrow shall consist of material reasonably free from silt, loam, clay, or organic matter. It shall be obtained from approved sources and shall meet the requirements for Vermont AOT Standard Specifications and the gradation requirements shown in Table 703.03A of the Vermont AOT Standard Specifications.

| <u>Sieve Designation</u> | <u>Percent Finer by Weight</u> |
|--------------------------|--------------------------------|
| 2"                       | 100                            |
| 1½"                      | 90 – 100                       |
| ¾"                       | 70 – 100                       |
| No. 4                    | 60 – 100                       |
| No. 100                  | 0 – 20                         |
| No. 200                  | 0 – 8                          |

2.07 GEOTEXTILE

- A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 3; AASHTO M 288.
2. Grab Tensile Strength: 157 lbf; ASTM D 4632.
3. Sewn Seam Strength: 142 lbf; ASTM D 4632.
4. Tear Strength: 56 lbf; ASTM D 4533.
5. Puncture Strength: 56 lbf; ASTM D 4833.
6. Apparent Opening Size: No. 70 sieve, maximum; ASTM D 4751.
7. Permittivity: 0.5 per second, minimum; ASTM D 4491.
8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

- B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 3; AASHTO M 288.
2. Grab Tensile Strength: 200 lbf; ASTM D 4632.
3. Sewn Seam Strength: 222 lbf; ASTM D 4632.
4. Tear Strength: 75 lbf; ASTM D 4533.
5. Puncture Strength: 90 lbf; ASTM D 4833.
6. Apparent Opening Size: No. 40 sieve, maximum; ASTM D 4751.
7. Permittivity: 0.02 per second, minimum; ASTM D 4491.
8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.
9. Weight: 4.0 oz/yd² minimum.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Identify known below grade utilities. Stake and flag locations.
- C. Maintain and protect existing utilities remaining which pass through work area.
- D. Upon discovery of unknown utility or concealed conditions, discontinue affected work; notify Engineer.

3.02 EROSION CONTROL

- A. Erosion control must be installed prior to beginning any earthwork operations.

3.03 TOPSOIL EXCAVATION

- A. Excavate topsoil from areas to be excavated, re-landscaped or regraded and stockpile in areas designated on site or as directed by the Engineer.
- B. Maintain the stockpile in a manner which will not obstruct the natural flow of drainage.

1. Maintain stockpile free from debris and trash.
2. Keep the topsoil damp to prevent dust and drying out.

3.04 SUBSOIL EXCAVATION

- A. Excavate subsoil from areas to be regraded in accordance with plans.
- B. Excavate subsoil required to accommodate site structures, construction operations, roads, and parking areas.
- C. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- D. Notify engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.
- E. Correct areas over-excavated by error as directed by the Engineer.
- 3.05 DITCHES
- A. Cut accurately to the cross-sections, grades, and elevations shown.
- B. Maintain excavations free from detrimental quantities of leaves, sticks, trash, and other debris until completion of the work.
- C. Dispose of excavated materials as shown on the drawings or directed by the Engineer; except do not, in any case, deposit materials less than three feet from the edge of a ditch.

3.06 ROADWAY EMBANKMENTS AND BERMS

- A. When embankments are to be made on a hillside, the slope of the original ground on which the embankments are to be constructed shall be stepped and properly drained as the fill is constructed so that adverse movements of the slopes do not occur.
- B. Any excavated rock, ledge, boulders, and stone, except where required in the construction of other items or otherwise directed, shall be used in the construction of embankments to the extent of the project requirements and generally shall be placed so as to form the base of an embankment.
- C. Frozen material shall not be used in the construction of embankments, nor shall the embankments or successive layers of the embankments be placed upon frozen material. Placement of material other than rock shall stop when the sustained air temperature, below 32 degrees Fahrenheit, prohibits the obtaining of the required compaction. If the material is otherwise acceptable, it shall be stockpiled and reserved for future use when its condition is acceptable for use in embankments.
- D. When an embankment is to be constructed across a swamp, muck, or areas of unstable soils, the unsuitable material shall be excavated to reach soils of adequate bearing capacity and the embankment begun. Alternative methods, such as use of a stabilization fabric in place of excavation and backfill, may be utilized only after approval of same by the Engineer.
- E. Material being placed in embankments shall be placed in horizontal layers of uniform thickness across the full width of the embankment. Stumps, trees, rubbish, and other unsuitable material shall not be placed in embankments.
- F. Embankment areas shall be placed in eight-inch maximum lifts. Effective spreading equipment shall be used on each layer to obtain uniform thickness prior to compaction. Each layer shall be kept crowned to shed water to the outside edge of embankment and continuous leveling and manipulating will be required to assure uniform density. The entire area of each layer shall be uniformly compacted to at least the required minimum density by use of compaction equipment consisting of rollers, compactors, or a combination thereof. Earth-moving and other equipment not specifically manufactured for compaction purposes will not be considered as compaction equipment.
- G. All fill material shall be compacted at a moisture content suitable for obtaining the required density. In no case shall the moisture content in each layer under construction be more than three percent above the optimum moisture content and shall be less than that quantity that will cause the embankment to become unstable during compaction. Sponginess, shoving, or other displacement under heavy equipment shall be considered evidence for an engineering determination of lack of stability under this requirement, and further placement of material in the area affected shall be stopped or retarded to allow the material to stabilize.
- H. When the moisture content of the material in the layer under construction is less than the amount necessary to obtain satisfactory compaction by mechanical compaction methods, water shall be added by pressure distributors or other approved equipment. Water may also be added in excavation or borrow pits. The water shall be uniformly and thoroughly incorporated into the soil by disc, harrowing, blading, or by other approved methods. This manipulation may be omitted

for sands and gravel. When the moisture content of the material is in excess of three percent above optimum moisture content, dry material shall be thoroughly incorporated into the wet material, or the wet material shall be aerated by disk, harrowing, blading, rotary mixing, or by other approved methods; or compaction of the layer of wet material shall be deferred until the layer has dried to the required moisture content by evaporation.

3.07 COMPACTION REQUIREMENTS

- A. All backfills and fills shall be compacted in even lifts (12" maximum) to attain the required densities as follows:

| <u>Location</u>                                     | <u>Modified Proctor<br/>ASTM D-1557</u> |
|-----------------------------------------------------|-----------------------------------------|
| Subgrade (8") and Gravel for Roads and Parking Lots | 95%                                     |
| General Embankments                                 | 90%                                     |

UTILITY TRENCHING AND BACKFILLING

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes:

1. Trench, backfill, and compact as specified herein and as needed for installation of underground utilities.

1.02 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.
- C. Comply with all requirements of governmental agencies having jurisdiction.

PART 2 – PRODUCTS

2.01 SOIL MATERIALS

- A. Fill and backfill materials:

1. Provide backfill materials free from organic matter and deleterious substances, containing no rocks or lumps over 6" in greatest dimension.
2. Fill material is subject to the approval of the Engineer, and is that material removed from excavations or imported from off-site borrow areas, predominantly granular, non-expansive soil free from roots and other deleterious matter.
3. Do not permit rocks having a dimension greater than 2" within 2' of the outside of pipe.
4. Cohesionless material used for backfill: Provide sand free from organic material and other foreign matter, and as approved by the Engineer.

PART 3 – EXECUTION

3.01 PROCEDURES

- A. Existing Utilities:

1. Unless shown to be removed, protect active utility lines shown on the drawings or otherwise made known to the Contractor prior to trenching. If damaged, repair or replace at no additional cost to the Owner.
2. When existing underground utilities, which are not scheduled for removal or abandonment, are encountered in the excavation, they shall be adequately supported and protected from damage. Any damage to utilities shall be repaired promptly at no additional cost to the Owner.
3. If the service is interrupted as a result of work under this section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.
4. If existing utilities are found to interfere with the permanent facilities being constructed under this section, immediately notify the Engineer and secure his instructions.
5. Do not proceed with permanent relocation of utilities until written instructions are received from the Engineer.

- B. Protection of persons and property:

1. Barricade open holes and depressions occurring as part of the work, and post warning lights on property adjacent to or with public access.
2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by operations under this section.

- C. Dewatering: The Contractor, at all times, shall conduct his operations so as to prevent the accumulation of water, ice, and snow in excavations or in the vicinity of excavated areas, and to prevent water from interfering with the progress of quality of the work. Under no conditions shall water be allowed to rise in open trenches after pipe has been placed.

- D. Accumulated water, ice, and snow shall be promptly removed and disposed of by pumping or other approved means. Disposal shall be carried out in a manner which will not create a hazard to public health, nor cause injury to public or private property, work completed or in progress, or public streets, nor cause any interference in the use of streets and road by the public. Pipes under construction shall not be used for drainage of excavations.

- E. Maintain access to adjacent areas at all time.

SITE ENGINEER:



CIVIL ENGINEERING ASSOCIATES, INC.  
10 MANSFIELD VIEW LANE, SOUTH BURLINGTON, VT 05403  
802-864-2323 FAX: 802-864-2271 web: www.cea-vt.com

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CLIENT:

BURLINGTON PARKS,  
RECREATION &  
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645 PINE ST., SUITE B  
BURLINGTON, VERMONT  
05401

PROJECT:

311 NORTH AVE.  
MULTI-USE PATH

311 NORTH AVE.  
BURLINGTON, VT

| DATE    | CHECKED | REVISION                |
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| 7/19/24 | DSM     | PERMIT REVIEW SUBMITTAL |
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SPECIFICATIONS

DATE

JUL., 2024

SCALE

NONE

PROJ. NO.

18118

DRAWING NUMBER

C5.0



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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 3.02 TRENCHING                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  | BITUMINOUS CONCRETE PAVING                                                                                                                                                                                                                                                                                                               |  | 3.06 JOINTS                                                                                                                                                                                                                                                                                                                                           |  | 2.04 METAL ACCESSORIES                                                                                                                                                                                                                                                                                                                                                                       |  |
| A. Care shall be exercised by the Contractor to avoid disrupting the operation of existing facilities without prior written approval of the Engineer.                                                                                                                                                                                                                                                                                                                                      |  | PART 1 – GENERAL                                                                                                                                                                                                                                                                                                                         |  | A. Joints between old and new pavements or between successive day's work shall be made so as to insure a thorough and continuous bond between the old and new mixtures. Whenever the spreading process is interrupted long enough for the mixture to attain its initial stability, the paver shall be removed from the mat and a joint constructed.   |  | A. Manhole frames and covers:                                                                                                                                                                                                                                                                                                                                                                |  |
| B. Provide sheeting and shoring necessary for protection of the work and for the safety of personnel.                                                                                                                                                                                                                                                                                                                                                                                      |  | 1.01 SUMMARY                                                                                                                                                                                                                                                                                                                             |  | PART 2 – PRODUCTS (Not Applicable)                                                                                                                                                                                                                                                                                                                    |  | 1. Grey cast iron, ASTM A48, as shown on plans.                                                                                                                                                                                                                                                                                                                                              |  |
| 1. Sheeting and bracing required for trenches shall be removed to the elevation of the pipe, but no sheeting will be allowed to be pulled, removed, or disturbed below the pipe.                                                                                                                                                                                                                                                                                                           |  | A. Section includes:                                                                                                                                                                                                                                                                                                                     |  | PART 3 – EXECUTION                                                                                                                                                                                                                                                                                                                                    |  | 2.05 STONE FILL                                                                                                                                                                                                                                                                                                                                                                              |  |
| C. A trench shall be excavated to the required depth and to a width sufficient to allow for joining of the pipe and compaction of the bedding and backfill material under and around the pipe. Where feasible, trench walls shall be vertical.                                                                                                                                                                                                                                             |  | 1. Base Courses                                                                                                                                                                                                                                                                                                                          |  | 3.1 EXAMINATION                                                                                                                                                                                                                                                                                                                                       |  | A. Stone for stone fill shall be approved, hard, blasted angular rock other than serpentine rock containing the fibrous variety chrysotile (asbestos). The least dimension of the stone shall be greater than 1/3 of the longest dimension. The stone fill shall be reasonably well graded from the smallest to the maximum size stone specified so as to form a compact mass when in place. |  |
| D. The completed trench bottom shall be firm for its full length and width.                                                                                                                                                                                                                                                                                                                                                                                                                |  | 2. Leveling Courses                                                                                                                                                                                                                                                                                                                      |  | A. Pre-Blast Survey and Site Examination:                                                                                                                                                                                                                                                                                                             |  | 1. Type I – The longest dimension of the stone shall vary from 1 inch to 12 inches, and at least 50 percent of the volume of the stone in place shall have a dimension of 4 inches.                                                                                                                                                                                                          |  |
| E. If indicated on the plans or directed by the Engineer, poor foundation material encountered below the normal grade of the pipe bed shall be removed and replaced with granular backfill.                                                                                                                                                                                                                                                                                                |  | 3. Finish Course                                                                                                                                                                                                                                                                                                                         |  | 1. Conduct a pre-blast survey on all adjacent buildings and individual water systems within a distance of 1,500 feet. The survey shall include pictures and notes of all signs of distress in the buildings and verification of quality and quantity of water in all individual water systems.                                                        |  | 2. Type II – The longest dimension of the stone shall vary from 2 inches to 36 inches, and at least 50 percent of the volume of the stone in place shall have a least dimension of 12 inches.                                                                                                                                                                                                |  |
| F. Where pipes are to be placed in embankment fill, the excavation shall be made after the embankment has been completed to a height of 3 feet plus the diameter of the pipe above the designed grade of the pipe.                                                                                                                                                                                                                                                                         |  | B. General: This work shall consist of one or more courses of bituminous mixture, constructed on a prepared foundation in accordance with these Specifications and the type of surface being placed, and in conformity with the lines, grades, thicknesses and typical cross sections shown on the plans or established by the Engineer. |  | 2. Verify site conditions and note all subsurface irregularities, which may affect any work requiring blasting.                                                                                                                                                                                                                                       |  | 3. Type III – The longest dimension of the stone shall vary from 3 inches to 48 inches and at least 50 percent of the volume of the stone in place shall have a least dimension of 16 inches.                                                                                                                                                                                                |  |
| G. Excavating for appurtenances:                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | 1.02 QUALITY ASSURANCE                                                                                                                                                                                                                                                                                                                   |  | 3. Identify required lines, levels, contours and datum.                                                                                                                                                                                                                                                                                               |  | 4. Type IV – The longest dimension of the stone shall vary from 3 inches to 60 inches, and at least 50 percent of the volume of the stone in place shall have a least dimension of 20 inches.                                                                                                                                                                                                |  |
| 1. Excavate for manholes and similar structures to a distance sufficient to leave at least 12" clear between outer surfaces and the embankment or shoring that may be used to hold and protect the banks.                                                                                                                                                                                                                                                                                  |  | A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.                                                                                 |  | 3.2 PREPARATION                                                                                                                                                                                                                                                                                                                                       |  | PART 3 – EXECUTION                                                                                                                                                                                                                                                                                                                                                                           |  |
| 2. Over-depth excavation beyond such appurtenances that has not been directed will be considered unauthorized. Fill with sand, gravel, or lean concrete as directed by the Engineer, and at no additional cost to the Owner.                                                                                                                                                                                                                                                               |  | B. All materials and installation shall be in accordance with The Asphalt Institute Manual (MS-4) and the VAOT Standard Specifications, (Latest Edition).                                                                                                                                                                                |  | A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, and other hazards created by blasting operations.                                                                                                                                                       |  | 3.01 INSPECTION                                                                                                                                                                                                                                                                                                                                                                              |  |
| H. Excavation shall not interfere with normal 45° bearing splay of foundations.                                                                                                                                                                                                                                                                                                                                                                                                            |  | C. Mixing Plant: Conform to State of Vermont Standards.                                                                                                                                                                                                                                                                                  |  | B. When ledge rock or boulders are encountered, the material shall be uncovered and the Contractor shall take cross-sections of the ledge rock surface. If the Contractor uncovers ledge but fails to cross section the undisturbed material, the Contractor shall have no right-of-claim to any classification other than that allowed by the Owner. |  | A. Examine the areas and conditions under which storm sewer system work is to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.                                                                                                 |  |
| I. All trenching shall be in accordance with the latest OSHA requirements.                                                                                                                                                                                                                                                                                                                                                                                                                 |  | D. Obtain materials from same source throughout.                                                                                                                                                                                                                                                                                         |  | 3.3 EXPLOSIVES                                                                                                                                                                                                                                                                                                                                        |  | 3.02 GENERAL                                                                                                                                                                                                                                                                                                                                                                                 |  |
| J. Where utility runs traverse public property or are subject to governmental or utility company jurisdiction, provide depth, bedding, cover, and other requirements as set forth by legally constituted authority having jurisdiction, but in no case less than the depth shown in the Contract Documents.                                                                                                                                                                                |  | 1.03 PROJECT CONDITIONS                                                                                                                                                                                                                                                                                                                  |  | A. Explosives: Obtain written permission and all necessary permits from authorities having jurisdiction (local, state and federal) before bringing explosives to Project site or using explosives on Project site.                                                                                                                                    |  | A. When existing underground utilities, which are not scheduled for removal or abandonment, are encountered in the excavation, they shall be adequately supported and protected from damage. Any damage to utilities shall be repaired promptly at no additional cost to the Owner.                                                                                                          |  |
| K. Where trenching occurs in existing lawns, remove turf in sections and keep damp. Replace turf upon completion of the backfilling.                                                                                                                                                                                                                                                                                                                                                       |  | A. Bituminous concrete shall not be placed between November 1 and May 1. Material shall not be placed when the granular subbase is wet or when the air temperature at the paving site in the shade and away from artificial heat is as follows:                                                                                          |  | 1. Perform blasting without damaging adjacent structures, property, or site improvements.                                                                                                                                                                                                                                                             |  | 3.03 PREPARATION                                                                                                                                                                                                                                                                                                                                                                             |  |
| 3.03 BEDDING                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  | Air Temperature<br>Degrees Fahrenheit                                                                                                                                                                                                                                                                                                    |  | 2. Perform blasting without weakening the bearing capacity of rock subgrade and with the least-practicable disturbance to rock to remain.                                                                                                                                                                                                             |  | A. Hand trim excavation (where necessary) to required elevations. Correct over-excavations with fill material.                                                                                                                                                                                                                                                                               |  |
| A. Pipe Bedding Area: Prior to laying pipe, bedding material shall be placed to the limits of the excavation and to a depth beneath the pipe as specified. This material shall be either sand, gravel, or crushed stone and shall not contain large lumps and stones over one inch in diameter. As the pipe is laid, bedding material shall be extended to 6" above the pipe and leveled along the width of the trench.                                                                    |  | 40 Degrees or below                                                                                                                                                                                                                                                                                                                      |  | 3.5 UNAUTHORIZED EXCAVATION                                                                                                                                                                                                                                                                                                                           |  | B. The slopes shall be graded to match the grade as shown on the plans. Where required, end sections shall be placed and backfilled to prevent undermining.                                                                                                                                                                                                                                  |  |
| 3.04 BACKFILLING                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | 50 Degrees or below                                                                                                                                                                                                                                                                                                                      |  | A. Fill unauthorized excavations under construction.                                                                                                                                                                                                                                                                                                  |  | C. Remove large stones or other hard matter which could damage drainage structures or impede consistent backfilling or compaction.                                                                                                                                                                                                                                                           |  |
| A. Backfilling shall not be done in freezing weather, with frozen materials, or when materials already placed are frozen.                                                                                                                                                                                                                                                                                                                                                                  |  | PART 2 – PRODUCTS                                                                                                                                                                                                                                                                                                                        |  | 1. If rock below grade is shattered by blasting caused by holes drilled too deep, or too heavy charges of explosives, or any other circumstance due to blasting, and if such shattered rock does not provide suitable foundation, the rock shall be removed and the excavation refilled with screened gravel at the expense of the Contractor.        |  | 3.04 INSTALLATION OF PIPE                                                                                                                                                                                                                                                                                                                                                                    |  |
| B. Unless otherwise specified or indicated on the plans, material used for backfilling trenches above the bedding area shall be suitable material which was removed during excavation or obtained from borrow and when compacted shall make a dense stable fill. The material shall not contain vegetation, porous matter, masses of roots, individual roots more than 18 inches long or ½ inch thick, or stones greater than 50 pounds or larger than six inches in the widest dimension. |  | 2.01 MATERIALS                                                                                                                                                                                                                                                                                                                           |  | PART 1 – GENERAL                                                                                                                                                                                                                                                                                                                                      |  | A. All pipe and fittings shall be carefully examined for defects and no pipe or fittings shall be laid which are known to be defective. If any defective piece is discovered after laying, it shall be removed and replaced at the Contractor's expense. All pipes and fittings shall be cleaned before they are laid and shall be kept clean until accepted in the completed work.          |  |
| C. If additional material is required, it shall be furnished from approved sources.                                                                                                                                                                                                                                                                                                                                                                                                        |  | A. Materials shall be combined and graded to meet the criteria as defined in the VAOT Standard Specifications, Division 700 for bituminous concrete.                                                                                                                                                                                     |  | 1.01 SUMMARY                                                                                                                                                                                                                                                                                                                                          |  | B. The pipe shall be laid to conform to the lines and grades indicated on the drawings or given by the Engineer. Each pipe shall be laid as to form a close joint with the next adjoining pipe and to bring the inverts continuously to the required grade.                                                                                                                                  |  |
| D. Backfill material shall be evenly spread and compacted in lifts not more than 12 inches thick or as approved by the Engineer. Previously placed or new materials shall be moistened by sprinkling, if required, to ensure proper bond and compaction.                                                                                                                                                                                                                                   |  | B. Gradation: Materials shall be combined and graded to meet composition limits specified in VAOT Standard Specification, Section 406.03, for the base course and finish course. Unless specifically shown on the Plans, all                                                                                                             |  | A. Section includes:                                                                                                                                                                                                                                                                                                                                  |  | C. Unless otherwise permitted by the Engineer, the Contractor shall provide for the temporary diversion of water to permit the installation of the pipe in a reasonably dry trench.                                                                                                                                                                                                          |  |
| E. Reopen trenches which have been improperly backfilled, to a depth as required for proper compaction. Refill and compact as specified, or otherwise correct to the approval of the Engineer.                                                                                                                                                                                                                                                                                             |  | 1. Bituminous concrete pavement shall be designed in conformance with the design criteria for heavy duty bituminous concrete pavement. (.75 blows/side)                                                                                                                                                                                  |  | 1. Culvert pipe and appurtenances.                                                                                                                                                                                                                                                                                                                    |  | D. Where the pipe is to be laid below the existing ground line, a trench shall be excavated to the required depth and to a width sufficient to allow for joining of the pipe and compaction of the bedding and backfill material under and around the pipe.                                                                                                                                  |  |
| F. Should any of the work be so enclosed or covered up before it has been approved, uncover all such work and, after approvals have been made, refill and compact as specified, all at no additional cost to the Owner.                                                                                                                                                                                                                                                                    |  | 2. All Asphalt Cement used in the bituminous concrete pavement shall be PG 58–28 (or VTrans approved mix) unless otherwise noted.                                                                                                                                                                                                        |  | 2. Stone fill.                                                                                                                                                                                                                                                                                                                                        |  | E. The completed trench bottom shall be firm for its full length and width.                                                                                                                                                                                                                                                                                                                  |  |
| G. Take special care in backfilling and bedding operations to not damage pipe and pipe coatings.                                                                                                                                                                                                                                                                                                                                                                                           |  | C. Thickness of paving for drives and parking lots shall be as shown on the plans, consisting of base course and finish course.                                                                                                                                                                                                          |  | 3. Drainage Structures                                                                                                                                                                                                                                                                                                                                |  | F. If indicated on the plans or directed by the Engineer, unsuitable foundation material encountered below the normal grade of the pipe bed shall be removed and replaced with Granular Backfill, or other specified or approved material.                                                                                                                                                   |  |
| H. No compacting shall be done when the material is too wet to be compacted properly. At such times the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compaction, or such other precautions are taken as may be necessary to obtain proper compaction.                                                                                                                                                                |  | D. For pavement reconstruction areas due to trenching, the depth of each course shall be increased by 1/2". Pavement reconstruction caused by trench reopening due to improper placement or non-approved placement shall be performed at no additional cost to the Owner.                                                                |  | 1.02 REFERENCES                                                                                                                                                                                                                                                                                                                                       |  | G. The Contractor shall take all necessary precautions to prevent floatation of the pipe in the trench.                                                                                                                                                                                                                                                                                      |  |
| 3.05 PLACING ASPHALT PAVEMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  | PART 3 – EXECUTION                                                                                                                                                                                                                                                                                                                       |  | A. Vermont Agency of Transportation Standard Specifications, Latest Edition.                                                                                                                                                                                                                                                                          |  | H. When pipe laying is not in progress, the open ends of the pipe shall be closed with temporary watertight plugs. If water is in the trench when work is resumed, the plug shall not be removed until all danger of water entering the pipe is eliminated.                                                                                                                                  |  |
| 1. Around all structures, under roadway paving, shoulder and embankments – 95%.                                                                                                                                                                                                                                                                                                                                                                                                            |  | 3.01 INSTALLATION                                                                                                                                                                                                                                                                                                                        |  | 1.03 SUBMITTALS                                                                                                                                                                                                                                                                                                                                       |  | 3.05 MANHOLES                                                                                                                                                                                                                                                                                                                                                                                |  |
| 2. All other areas – 90%.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | A. Install in accordance with VAOT Standard Specifications, Section 406.                                                                                                                                                                                                                                                                 |  | A. Manufacturer's technical data for:                                                                                                                                                                                                                                                                                                                 |  | 1. Place precast concrete structures and covers as shown on the Drawings.                                                                                                                                                                                                                                                                                                                    |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | 3.02 EXAMINATION                                                                                                                                                                                                                                                                                                                         |  | 1. Pipe and appurtenances.                                                                                                                                                                                                                                                                                                                            |  | 2. Where manholes occur in pavement, set tops of frames and covers flush with finish surface.                                                                                                                                                                                                                                                                                                |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | A. Verify that compacted granular base is dry and ready to support paving and imposed loads.                                                                                                                                                                                                                                             |  | 2. Structures.                                                                                                                                                                                                                                                                                                                                        |  | 3. Provide rubber joint gasket complying with ASTM C443.                                                                                                                                                                                                                                                                                                                                     |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | B. Verify gradients and elevations of base are correct.                                                                                                                                                                                                                                                                                  |  | PART 2 – PRODUCTS                                                                                                                                                                                                                                                                                                                                     |  |                                                                                                                                                                                                                                                                                                                                                                                              |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | 3.03 PREPARATION                                                                                                                                                                                                                                                                                                                         |  | 2.01 GENERAL REQUIREMENTS                                                                                                                                                                                                                                                                                                                             |  |                                                                                                                                                                                                                                                                                                                                                                                              |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | A. Matching Surfaces: When a new pavement is to match an existing bituminous pavement for a roadway or trench, the Contractor shall vertically smooth cut the existing pavement, over the existing gravel base. The smooth cut shall be thoroughly cleaned and coated with Emulsified Asphalt, RS–1, just prior to paving.               |  | A. Furnish ells, tees, reducing tees, wyes, couplings, increasers, crosses, transitions and end caps of the same type and class of material as the conduit, or of material having equal or superior physical and chemical properties as acceptable to the Engineer.                                                                                   |  |                                                                                                                                                                                                                                                                                                                                                                                              |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | 3.04 PREPARATION – TACK COAT                                                                                                                                                                                                                                                                                                             |  | 2.02 DRAINAGE PIPE & PERFORATED PIPE                                                                                                                                                                                                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                              |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | A. When the bottom course of bituminous concrete pavement is left over the winter, or paving is to be made over an existing bituminous concrete pavement, the existing surface shall be cleaned and Emulsified Asphalt applied before the next course is applied.                                                                        |  | A. Culvert / Drainage Pipe                                                                                                                                                                                                                                                                                                                            |  |                                                                                                                                                                                                                                                                                                                                                                                              |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | B. Also apply to contact surfaces of curbs.                                                                                                                                                                                                                                                                                              |  | 1. Corrugated Polyethylene pipe and fittings (smooth interior) meeting the requirements of AASHTO M–294 and M–252                                                                                                                                                                                                                                     |  |                                                                                                                                                                                                                                                                                                                                                                                              |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | C. Coat surfaces of manhole and catch basin frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.                                                                                                                                                                                                      |  | 2. for drainage piping installed by directional boring techniques, use PE 3408 high density polyethylene pipe meeting ASTM D3350 Standard (SDR 11 or better)                                                                                                                                                                                          |  |                                                                                                                                                                                                                                                                                                                                                                                              |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                                                                                                                                                                                                                                                                                                                                          |  | 2.03 CONCRETE STRUCTURES                                                                                                                                                                                                                                                                                                                              |  |                                                                                                                                                                                                                                                                                                                                                                                              |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                                                                                                                                                                                                                                                                                                                                          |  | A. ASTM C478, sized as indicated.                                                                                                                                                                                                                                                                                                                     |  |                                                                                                                                                                                                                                                                                                                                                                                              |  |
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CURBS AND WALKS

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes:
- 1. Concrete Curbs
  - 2. Concrete Sidewalks

PART 2 – PRODUCTS

2.01 CONCRETE

- A. The concrete shall have a minimum compressive strength of 3,500 psi at 28 days and shall conform to the requirements of VTrans specification 541.03A Class B mix.

2.02 ADMIXTURES

- A. Air-entraining admixture shall meet or exceed ASTM C260. Air content shall range from minimum of 5% to 7%.

2.03 EXPANSION JOINT MATERIAL

- A. Expansion joint material shall be premolded bituminous filler conforming to ASTM D994.

PART 3 – EXECUTION

3.01 CONCRETE CURBS

- A. Excavation shall be made to the required depth and the base material upon which the curb is to be set shall be compacted to a firm, even surface. All soft and unsuitable material shall be removed and replaced with suitable material which shall be thoroughly compacted.

- B. Installation: The curb shall be set so that the front top line is in close conformity to the line and grade required. All space under the curbing shall be filled and thoroughly tamped with material meeting the requirements of the material for the bed course.

- C. Concrete Mixing and Placing: Compaction of concrete placed in the forms shall be by spading or other approved methods. Forms shall be left in place for 24 hours or until the concrete has set sufficiently so that they can be removed without injury to the curbing. Upon removal of the forms, the curb shall be immediately rubbed down to a smooth and uniform surface but no plastering will be permitted. For this work, competent and skillful finishers shall be employed.

- D. Sections: Curbing shall be constructed in sections having a uniform length of ten feet, unless otherwise ordered. Sections shall be separated by open joints 1/8 inch wide except at expansion joints.

- E. Expansion Joints: Expansion joints shall be formed at the intervals shown on the plans using a pre-formed expansion joint filler having a thickness of 1/4 inch cut to conform to the cross-section of the curb. They shall be constructed at 60 foot intervals or as directed by the Engineer. When the curb is constructed adjacent to or on concrete pavement, expansion joints shall be located opposite or at expansion joints in the pavement.

- F. Backfilling: After the concrete has set sufficiently, the spaces in front and back of the curb shall be filled to the required elevation with layers of not more than six inches of the same material as the bedding and thoroughly tamped.

- G. The Contractor shall protect the curb and keep it in alignment until the completion of the contract. Each curb which is damaged at any time previous to final acceptance of the work shall be removed and replaced with satisfactory curb at the Contractor's expense.

- H. Anti-spalling compound: When the initial curbing period is over (approximately 28 days after placement), all exposed surfaces shall receive two (2) coats of anti-spalling compound. The surfaces shall be cleaned, and then the compound shall be applied; the first coat at a rate of .025 gallons per square yard, and the second at a rate of .015 gallons per square yard. Anti-spalling compound shall only be applied when the air temperature is above 50 degrees Fahrenheit.

3.02 GRANITE CURBING

- A. Sloped granite curbing shall be hard, durable, reasonably uniform in appearance and free from weakening seams. Surfaces shall be as follows:

- Top:6” wide, sawn true plane.
- Front Face: Smooth quarry split, right angle top (No drill holes showing in top 10”)
- Back Face Exposed: Plane parallel with front face, straight split to 1 1/2” below surface.
- End Face Exposed: Square planes on top and face.
- Joints Exposed: Maximum 1” and pointed with mortar. Exposed faces shall be finished with a jointer. Remove all excess mortar from exposed faces.
- Length: Minimum length 3’.

Provide curved curbing to conform to radii indicated on the Contract Plans.

3.03 CONCRETE SIDEWALKS

- A. Excavation and Foundation: Excavation shall be made to the required depth and to a width that will permit placing of bed course material and the installation and bracing of the forms. Bed course material shall be placed to the depth and section shown on the plans. When the layer required exceeds six inches, two layers of approximately equal depth shall be placed and each layer thoroughly compacted so that it is hard and unyielding. The wetting of bed course material may be required to obtain the compaction.

- B. Finishing: The surface shall be finished with a wooden float. No plastering will be permitted. The edges shall be rounded with an edger having a radius of 1/4 inch. The surface of

the sidewalk, after the floating and screeding process is completed, shall be finished with a broom of a type approved by the Engineer, drawn over the surface parallel to the transverse joints. Special texturing on sidewalk ramps shall be installed in accordance with construction plan details.

- C. Joints: Unless otherwise indicated on the plans or directed by the Engineer, expansion joints shall not be used in the sidewalk. Expansion joints shall be formed around all appurtenances such as manholes, utility poles and other obstructions extending into and through the sidewalk. Pre-formed joint filler 1/4 inch thick shall be installed in these joints. Expansion joint filler of the thickness indicated shall be installed between concrete sidewalks and any fixed structure such as a building or bridge. This expansion joint material shall extend for the full depth of the walk. Between the expansion joints, the sidewalk shall be divided at intervals of 5 feet by dummy joints formed by sawcutting or other acceptable means as directed to provide grooves approximately 1/16 inch wide and at least 1/3 of the depth.

When the sidewalk is constructed next to a concrete curb expansion, joint material shall be placed between sidewalk and curb for the depth of the sidewalk.

- D. Curing: During the curing period all traffic, both pedestrian and vehicular, shall be excluded. Vehicular traffic shall be excluded for such additional time as the Engineer may direct.

- E. Backfilling: Before the concrete has been opened to traffic, the space on each side of the sidewalk shall be backfilled to the required elevation with suitable material, firmly compacted and neatly graded.

LANDSCAPE GRADING

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes:

- 1. Finish grading; bring rough grade in areas to design elevations as shown on the drawings.
- 2. Topsoil: Work shall consist of furnishing, placing and shaping topsoil, or placing, spreading, and shaping topsoil form stockpiles or stripped areas.

PART 2 – PRODUCTS

2.01 TOPSOIL

- A. Topsoil shall be loose, friable, reasonably free of admixtures of subsoil, free from refuses, stumps, roots, brush, weeds, rocks, and stones 1 1/4 inch in overall dimensions. The topsoil shall also be free from any material that will prevent the formation of a suitable seedbed or prevent seed germination and plant growth. It shall contain not less than three (3) nor more than twenty (20) percent organic matter. Any material which has become mixed with undue amounts of subsoil during any operation at the source or during placing or spreading will be rejected and shall be replaced by the Contractor with acceptable material.

PART 3 – EXECUTION

3.01 SUBGRADE PREPARATION

- A. Clean subgrade of all stumps, stones, roots, trash or other materials which might hinder proper tillage or spreading.
- B. All surfaces on which topsoil is to be placed shall be graded to a reasonably true surface and scarified by raking, discing or other approved means to a minimum depth of two inches before placing topsoil.

3.03 PLACING TOPSOIL

- A. Minimum final depth of topsoil shall be 4 inches.
- B. Place topsoil when seeding operations can closely follow spreading operations. Use topsoil in relatively dry state.
- C. Topsoil shall be spread and shaped to the lines and grades shown on the plans, or as directed by the Engineer. The depth stated in the contract to which the topsoil is to be placed is that required after final rolling of the material has taken place. All stones, roots and debris over 1¼ inch in diameter along with any sodding weeds and other undesirable material shall be removed.
- D. After shaping and grading, all trucks and other equipment shall be excluded from the topsoiled area to prevent excessive compaction. The Contractor shall perform such work as required to provide a friable surface for seed germination and plant growth prior to seeding.
- E. It shall be the Contractor's responsibility to restore to the line, grade and surface all eroded areas with approved material and to keep topsoiled areas in acceptable condition until the completion of the work.

SEEDING

PART 1 – GENERAL

1.1 Section Includes:

- A. Seeding.

- 1. Furnish all labor, materials and equipment to complete all seeding work as shown on the drawings and specified herein.
- 2. Except where otherwise shown or specified, the Contractor shall seed all areas where new contours are shown on the drawings and all areas where existing ground cover has been disturbed by the Contractor's operations.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 PROJECT CONDITIONS

Planting Restrictions: Seeding and initial fertilizing shall be done between May 1st and September 15th unless otherwise authorized. Seeding shall not be done during windy weather or when the ground is frozen, excessively wet, or otherwise untilable. If seeding is done during July or August, additional mulch material may be required. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion.

PART 2 – PRODUCTS

2.1 SEED

- A. Conservation Seed Mix:

| Kind of Seed        | Minimum Purity | Minimum Germination | Lbs./Acre |
|---------------------|----------------|---------------------|-----------|
| Creeping Red Fescue | 98%            | 85%                 | 22.5      |
| Tall Fescue         | 95%            | 95%                 | 22.5      |
| Red Top             | 95%            | 90%                 | 3         |
| Birdsfoot Trefoil   | 98%            | 85%                 | 9         |
| Annual Ryegrass     | 95%            | 85%                 | 3         |
| TOTAL =             |                |                     | 60        |

2.2 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C 602, agricultural limestone containing a minimum of 85 percent calcium carbonate equivalent and as follows:

- 1. Class: T, with a minimum of 99 percent passing through No. 8 sieve and a minimum of 75 percent passing through No. 60 sieve.

2.3 FERTILIZER

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium.
- B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium.

2.4 MULCHES

- A. Mulch: Provide air-dry, clean, mildew- and seed-free, hay or threshed straw of wheat, rye, oats, or barley.

- B. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 2 to 5 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

- 1. Organic Matter Content: 50 to 60 percent of dry weight.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
- 1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
  - 2. Protect grade stakes set by others until directed to remove them.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter.
- 1. Apply fertilizer directly to subgrade before loosening.
    - a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
    - b. Mix lime with dry soil before mixing fertilizer.
- D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
- E. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- F. Before planting, restore areas if eroded or otherwise disturbed after finish grading.

3.2 APPLICATION RATES

- A. When a soil test is not available, the following minimum amounts should be applied:
- 1. Agricultural limestone: 2 tons/acre.
  - 2. Nitrogen (N): 50 lbs./acre.
  - 3. Phosphate: 100 lbs./acre.
  - 4. Potash: 100 lbs./acre.
    - a. This is the equivalent of 500 lbs./acre of 10–20–20 fertilizer or 1,000 lbs./acre of 5–10–10.
  - 5. Hay mulch: 2 tons/acre.

3.3 SEEDING

- A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.

- 1. Do not use wet seed or seed that is moldy or otherwise damaged.

- 2. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.

- B. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.

- C. Protect seeded areas with slopes exceeding 1:3 with erosion-control blankets installed and stapled according to manufacturer's written instructions.

- D. Protect seeded areas from hot, dry weather or drying winds by applying mulch within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a depth of 3/16 inch, and roll surface smooth.

3.4 HYDROSEEDING

- A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

- 1. Mix slurry with fiber-mulch manufacturer's recommended tackifier.

- 2. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate.

3.5 MAINTENANCE

- A. Maintain and establish seeding by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn. Provide materials and installation the same as those used in the original installation.

- 1. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.

- 2. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:

- a. Seeded Areas: 90 days from date of Substantial Completion.
- b. When initial maintenance period has not elapsed before end of planting season, or if seeding is not fully established, continue maintenance during next planting season.

3.6 SATISFACTORY CONDITIONS

- A. Installations shall meet the following criteria as determined by Engineer/Owner:

- 1. Satisfactory Seeded Area: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.

- B. Use specified materials to reestablish area that do not comply with requirements and continue maintenance until areas are satisfactory.

3.7 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris, created by work. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

- B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after lawn is established.

- C. Remove nondegradable erosion-control measures after grass establishment period.

SITE ENGINEER:



CIVIL ENGINEERING ASSOCIATES, INC.  
10 MANSFIELD VIEW LANE, SOUTH BURLINGTON, VT 05403  
802-864-2323 FAX: 802-864-2271 web: www.cea-vt.com

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DRAWN

SAL

CHECKED

DSM

APPROVED

DSM

CLIENT:

**BURLINGTON PARKS,  
RECREATION &  
WATERFRONT**  
**645 PINE ST., SUITE B  
BURLINGTON, VERMONT  
05401**

PROJECT:

**311 NORTH AVE.  
MULTI-USE PATH**

**311 NORTH AVE.  
BURLINGTON, VT**

| DATE    | CHECKED | REVISION                |
|---------|---------|-------------------------|
| 7/18/24 | DSM     | PERMIT REVIEW SUBMITTAL |
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SPECIFICATIONS

DATE

JUL., 2024

SCALE

NONE

PROJ. NO.

18118

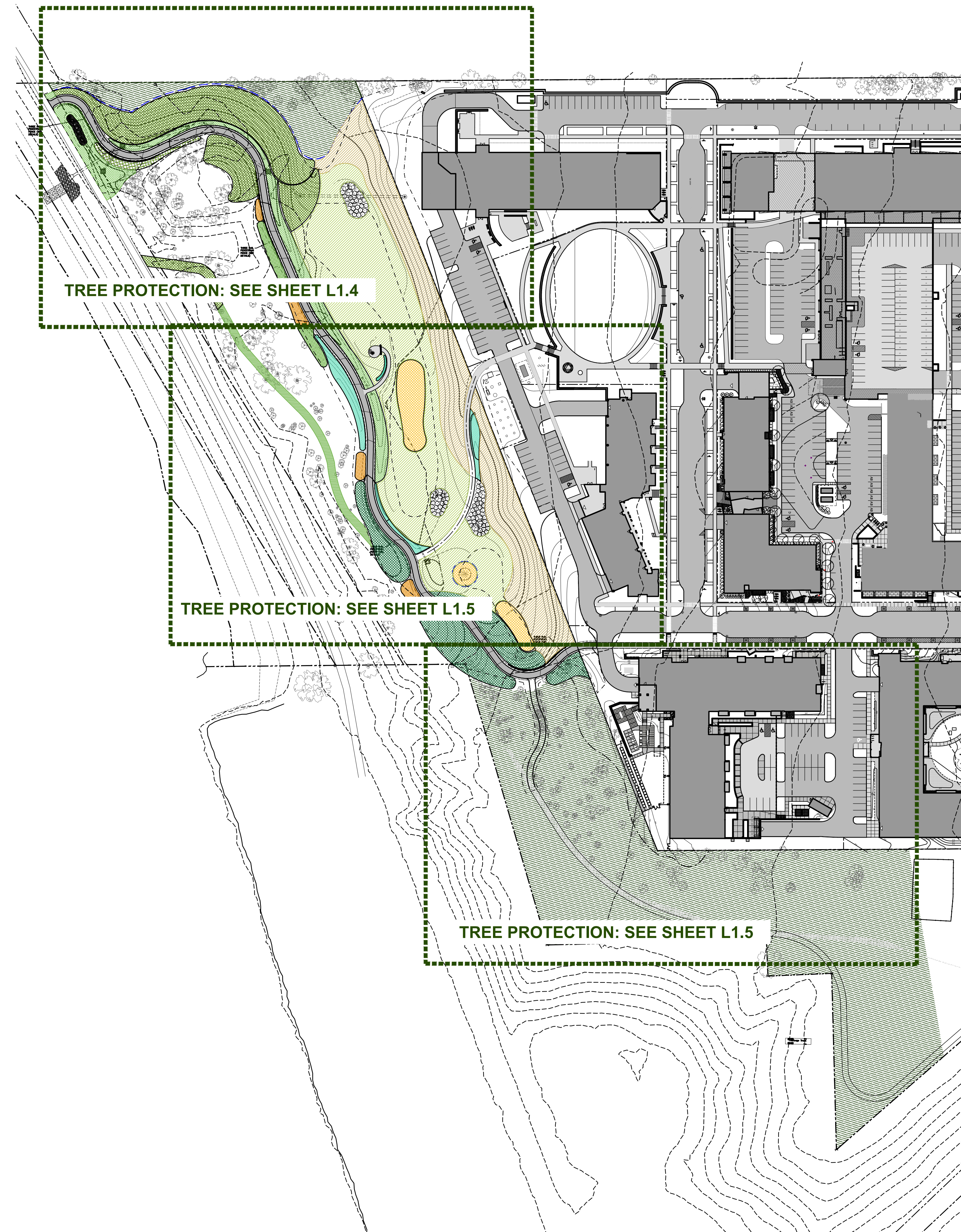
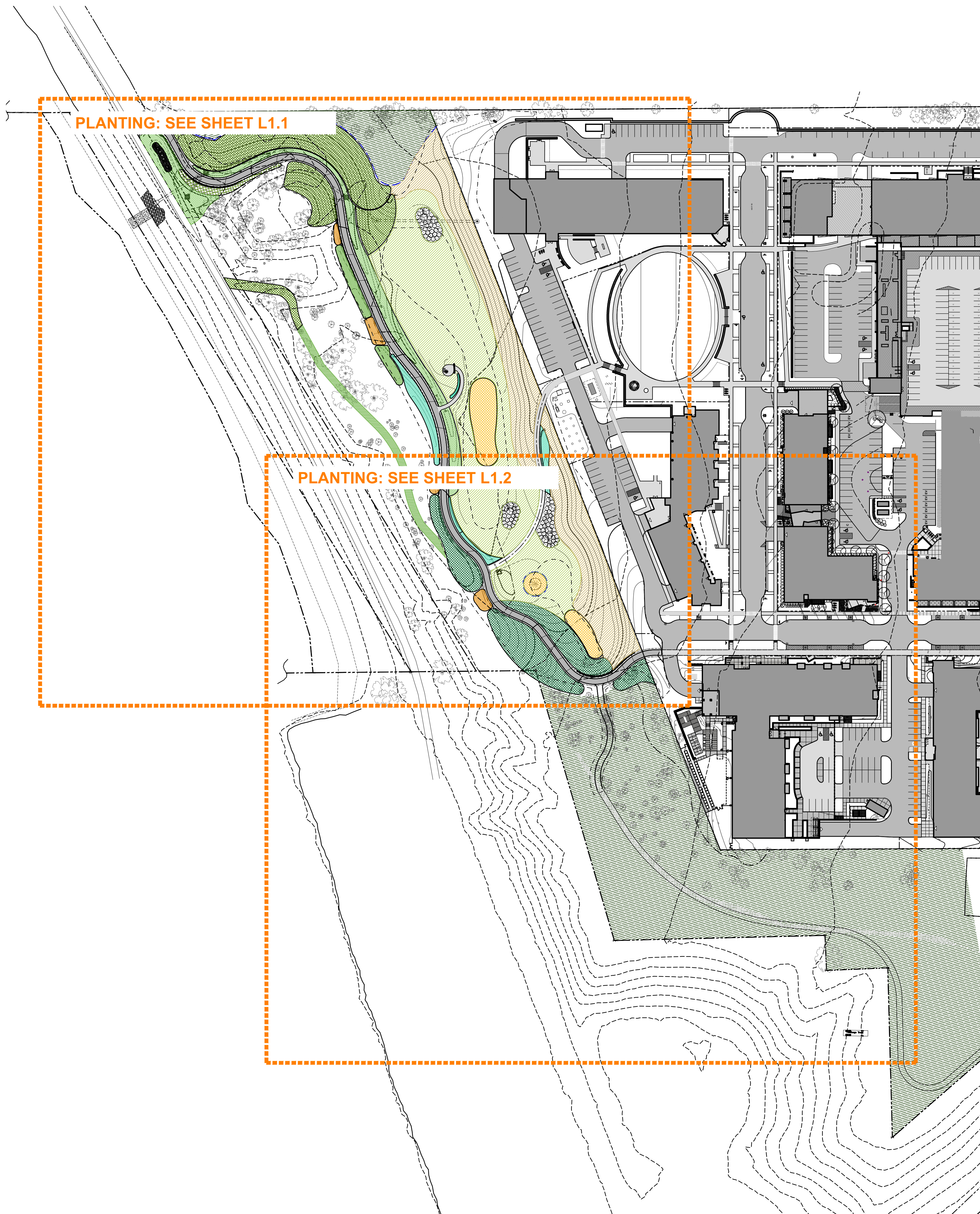
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C5.2











**LAKEVIEW CEMETERY**

**LAKE CHAMPLAIN**

**ZONE 10: DRY SWALE**

**Zone 10 Rain Garden - TBD**

| % by genus | Qty. | Code | Scientific Name                   | Common Name        | Size  | Spec    | Installation Notes |
|------------|------|------|-----------------------------------|--------------------|-------|---------|--------------------|
| 23%        | 107  | AC   | <i>Aquilegia canadensis</i>       | Red Columbine      | Clump | 2" plug | 12" o.c.           |
| 7%         | 33   | EG   | <i>Euthamia graminifolia</i>      | Flat-top Goldentop | Clump | 2" plug | 18" o.c.           |
| 27%        | 126  | PA   | <i>Pteridium aquilinum</i>        | Bracken Fern       | Clump | 2" plug | 12" o.c.           |
| 1%         | 6    | SP   | <i>Silphium perfoliatum</i>       | Cup Plant          | Clump | 1 gal.  | 36" o.c.           |
| 21%        | 98   | LC   | <i>Lobelia cardinalis</i>         | Cardinal Flower    | Clump | 2" plug | 12" o.c.           |
| 22%        | 105  | CT   | <i>Caulophyllum thalictroides</i> | Blue Cohosh        | Clump | 2" plug | 12" o.c.           |

**Zone 10 Rain Garden Details:**

- PA (TYP)
- CT (TYP)
- EG (TYP)
- SP (TYP)
- AC (TYP)
- LC (TYP)
- PA (TYP)
- GRASS FILTER STRIP SEE STORM WATER DWGS

**Plantings and Features:**

- AR1 (10), AL1 (20), BP (10), BO (10), CC (20), FG (20), HV1 (20), PR (40), PS1 (40), QR (55), QV (55) (300 TOTAL) 6-10' O.C.
- AR1 (2), AL1 (3), BP (1), BO (1), CC (3), FG (3), HV1 (3), QR (6), QV (6) (28 TOTAL) 6-10' O.C.
- AR1 (1), BP (2), BO (2), CC (2), FG (4), PR (5), PS1 (5), QR (3), QV (3) (25 TOTAL) 6-10' O.C.
- AR3 (6), AR2 (8), AL (4), BP (3), BO (1), CC (4), FG (6), HV1 (4), PR2 (6), PR1 (2), PS2 (2), QR (2), QV (2) (50 TOTAL)
- AR3 (7), AR2 (10), AL (6), BP (5), BO (2), CC (6), FG (7), HV1 (8), PR2 (7), PR1 (3), PS2 (2), QR (2), QV (2) (65 TOTAL)
- AR3 (10), AR2 (14), AL (8), BP (6), BO (2), CC (8), FG (10), HV1 (8), PR2 (10), PR1 (4), PS2 (4), QR (3), QV (3) (80 TOTAL)
- AR3 (2), AR2 (3), AL (2), BP (1), CC (2), FG (2), HV1 (2), PR2 (2), QR (1), QV (1) (18 TOTAL)

**Structures and Paths:**

- 10, 2C, 2B, 2A, 2D, 2E, 4D, 4A, 4B, 4C, 4E, 5A, 5B, 5C, 5D, 5E, 6A, 6B, 6C, 6D, 6E, 6F, 6G, 6H, 6I, 6J, 6K, 6L, 6M, 6N, 6O, 6P, 6Q, 6R, 6S, 6T, 6U, 6V, 6W, 6X, 6Y, 6Z
- SELECTIVE CLEARING & SEEDING
- FENCE, TYP. SEE CIVIL DWGS
- SEE CIVIL DWGS FOR DECOMMISSIONING OF STEEP SECTION OF OLD TRAIL
- BURLINGTON BIKE PATH
- CLOSE EXISTING TRAIL PER BPRW CONSERVATION TEAM PLANS
- BERM AREA TO BE REVIEWED ON SITE. CONSTRUCTION PATH TO FINAL AREA TBD
- 5' TYP. MIN. FOR ALL SHRUBS ALONG PATH
- THREE RAIL FENCE (SEE DETAILS)
- BLOCK EXISTING PATH WITH CUT VEGETATION

TREES SPACED AN AVERAGE OF 9' O.C. + EROSION CONTROL SEED MIX PER CIVIL PLANS

 **ZONE 2: RED & BLACK OAK DOMINANT FOREST**

TREES SPACED AN AVERAGE OF 8' O.C. + EROSION CONTROL SEED MIX PER CIVIL PLANS


**ZONE 3: LARGE SHRUBS ISLANDS IN MEADOW**

SMALL TREES / LARGE SHRUBS, LARGER STOCK TIGHTLY SPACED, NO SEED MIX

 **ZONE 4: FOREST EDGE SHRUB PLANTING**

MEDIUM AND LARGE SHRUBS, NO SEED MIX

 **ZONE 5: LOW FLOWERING AND EDIBLE SHRUBS**

MULCHED PLANT BED, NO SEED BED

 **ZONE 6a: NATIVE PRAIRIE SEED MIX**

## MIX OF NATIVE WILDFLOWERS + NATIVE GRASSES

MOW ANNUALLY IN FALL TO PREVENT GROWTH OF WOODY VEGETATION

 **ZONE 6b: NATIVE DRY SLOPE PRAIRIE SEED MIX**

## MIX OF NATIVE WILDFLOWERS + NATIVE GRASSES FOR EROSION CONTROL

MOW ANNUALLY IN FALL TO PREVENT GROWTH OF WOODY VEGETATION

 **ZONE 7: PART SHADE SEED MIX**

**ZONE 8: NATIVE DETENTION AREA GRASSES MIX**

MIX OF NATIVE GRASSES AND GRASSLIKE SPECIES FORMULATED FOR

**ZONE 9 BIRCH & WHITE PINE PRESERVATION AREAS**

## SELECTIVE CLEARING & SEEDING

9A - EXISTING PINE TO BE PRESERVED

9B & 9C - CLEARING\* AND TREE PROTECTION TO BE REVIEWED AND APPROVED BY  
CITY ARBORIST AND LAND STEWARD

**NOTES:**

**\*Zone 6a Native Prairie Seed Mix Composition by %**

**Little Bluestem, 33%; Big Bluestem, 2%; Switchgrass 'Blackwell', 3%; Virginia Wildrye, 10%; Purple Lovegrass, 1%; Deerfoot, 6%; Spotted St. Johnswort, 1%; Lanceolef coreopsis, 2%; Blackeyed Susan, 5%; Blue Vervain, 7%; Golden Alexander, 7%; New England Aster, 1%; Tall White Beardtongue, 4%; Narrowleaf mountainmint, 3%; Yellow false indigo, 5%; Wild bergamot, 2%; Gray goldenrod, 5%; Common milkweed, 5%; Wrinkleleaf goldenrod, 5%; White goldenrod, 5%; Smooth blue aster, 5%; Roundhead lespedeza, 1.5%; Panicledale Ticksiftrel, 1%; Grassleaf goldenrod, 1.5%; Oxeys Sunflower, 2%; Partridge**  
**\*\*Zone 6b Dry Slope Prairie Seed Mix Composition by %**  
 Cats, 50%; Little Bluestem, 20%; Big Bluestem 'Nagard', 4%; Switchgrass, 4%; Indiangrass, 4%; Purple Lovegrass, 1%; Junegrass, 2%; Butterfly milkweed, 3%; Indiangrass, 1%; Heath aster, 2%; Canadian milkvetch, 1%; Partridge Pea, 3%; Pale purple coneflower, 3%; Early goldenrod, 5%; Gray goldenrod, 5%

- REMOVAL OF TREES TO BE COORDINATED WITH A BAT HABITAT SPECIALIST.





**ZONE 1: RED MAPLE & BIRCH DOMINANT FOREST**  
TREES SPACED AN AVERAGE OF 9' O.C. + EROSION CONTROL SEED MIX PER CIVIL PLANS

| Zone 1 - Maple dominant forest |      |      |                      |                 |        |                       |                                                                                        |
|--------------------------------|------|------|----------------------|-----------------|--------|-----------------------|----------------------------------------------------------------------------------------|
| % by genus                     | Qty. | Code | Scientific Name      | Common Name     | Size   | Spec                  | Installation Notes                                                                     |
| 27%                            | 25   | AR3  | Acer rubrum - large  | Red Maple       | 4-6'   | bareroot or container | 8-12' spacing, 9' on avg. Locate stems a minimum of 5' away from shoulder of bike path |
|                                | 35   | AR2  | Acer rubrum - small  | Red Maple       | 3-4'   |                       |                                                                                        |
| 9%                             | 20   | AL2  | Amelanchier laevis   | Smooth Shadbush | 3-4'   |                       |                                                                                        |
| 9%                             | 15   | BP   | Betula papyrifera    | Paper Birch     | 3-4'   |                       |                                                                                        |
|                                | 5    | BO   | Betula populifolia   | Gray Birch      | 3-4'   |                       |                                                                                        |
| 9%                             | 20   | CC   | Corylus cornuta      | Beaked Hazelnut | 2-3'   |                       |                                                                                        |
| 11%                            | 25   | FG   | Fagus grandifolia    | American Beech  | 2-3'   |                       |                                                                                        |
| 9%                             | 20   | HV1  | Hamamelis virginiana | Witchazel       | 2-3'   |                       |                                                                                        |
| 19%                            | 25   | PR2  | Pinus rigida         | Pitch pine      | 4-6'   |                       |                                                                                        |
|                                | 9    | PR1  | Pinus rigida         | Pitch pine      | 2-3'   |                       |                                                                                        |
| 7%                             | 8    | PS2  | Pinus strobus        | White pine      | 3-4'   |                       |                                                                                        |
|                                | 8    | QR   | Quercus rubra        | Red Oak         | 3-4'   |                       |                                                                                        |
|                                | 8    | QV   | Quercus velutina     | Black Oak       | 12-18" |                       |                                                                                        |

**ZONE 2: RED & BLACK OAK DOMINANT FOREST**  
TREES SPACED AN AVERAGE OF 8' O.C. + EROSION CONTROL SEED MIX PER CIVIL PLANS

| Zone 2 Oak Dominant forest |      |      |                      |                 |        |                       |                                                                                            |
|----------------------------|------|------|----------------------|-----------------|--------|-----------------------|--------------------------------------------------------------------------------------------|
| % by genus                 | Qty. | Code | Scientific Name      | Common Name     | Size   | Spec                  | Installation Notes                                                                         |
| 3%                         | 15   | AR1  | Acer rubrum          | Red Maple       | 2-3'   | bareroot or container | 5-10' spacing, 8' on average. Locate stems a minimum of 5' away from shoulder of bike path |
| 11%                        | 55   | AL1  | Amelanchier laevis   | Smooth Shadbush | 2-3'   |                       |                                                                                            |
| 6%                         | 15   | BP   | Betula papyrifera    | Paper Birch     | 2-3'   |                       |                                                                                            |
|                            | 15   | BO   | Betula populifolia   | Gray Birch      | 2-3'   |                       |                                                                                            |
| 11%                        | 55   | CC   | Corylus cornuta      | Beaked Hazelnut | 2-3'   |                       |                                                                                            |
| 6%                         | 30   | FG   | Fagus grandifolia    | American Beech  | 2-3'   |                       |                                                                                            |
| 11%                        | 55   | HV1  | Hamamelis virginiana | Witchazel       | 2-3'   |                       |                                                                                            |
| 21%                        | 55   | PR   | Pinus rigida         | Pitch pine      | 2-3'   |                       |                                                                                            |
|                            | 55   | PS1  | Pinus strobus        | White pine      | 2-3'   |                       |                                                                                            |
| 32%                        | 84   | QR   | Quercus rubra        | Red Oak         | 3-4'   |                       |                                                                                            |
|                            | 84   | QV   | Quercus velutina     | Black Oak       | 12-18" |                       |                                                                                            |

**ZONE 3: LARGE SHRUBS ISLANDS IN MEADOW**  
SMALL TREES / LARGE SHRUBS, LARGER STOCK TIGHTLY SPACED, NO SEED MIX

| Zone 3 Large Shrub Groupings in Meadow |      |      |                    |                 |          |                |                                   |
|----------------------------------------|------|------|--------------------|-----------------|----------|----------------|-----------------------------------|
| % by genus                             | Qty. | Code | Scientific Name    | Common Name     | Size     | Spec           | Installation Notes                |
| 56%                                    | 54   | AA   | Aronia arbutifolia | Red Chokeberry  | 3-4' Ht. | B&B or Cont.   | 5-7' o.c. center min. 5' off path |
| 11%                                    | 11   | AL3  | Amelanchier laevis | Smooth Shadbush | 5-6' Ht. | B&B multi-stem | 7-8' o.c.                         |
| 32%                                    | 31   | CR   | Cornus racemosa    | Gray Dogwood    | 3-4' Ht. | B&B multi-stem | 5-7' o.c.                         |

**ZONE 4: FOREST EDGE SHRUB PLANTING**  
MEDIUM AND LARGE SHRUBS, NO SEED MIX

| % by genus | Qty. | Code | Scientific Name     | Common Name  | Size | Spec     | Installation Notes                    |
|------------|------|------|---------------------|--------------|------|----------|---------------------------------------|
| 50%        | 88   | CP2  | Comptonia peregrina | Sweet Fern   | 2-3' | #2 Cont. | 4' o.c. centers min. 24" off shoulder |
| 50%        | 88   | KL   | Salix discolor      | Pussy Willow | 3-4' | #3 Cont. | 4' o.c. centers min. 24" off shoulder |
|            | 132  |      |                     |              |      |          |                                       |

**ZONE 5: LOW FLOWERING AND EDIBLE SHRUBS**  
MULCHED PLANT BED, NO SEED BED

| % by genus | Qty. | Code | Scientific Name         | Common Name         | Size   | Spec     | Installation Notes                    |
|------------|------|------|-------------------------|---------------------|--------|----------|---------------------------------------|
| 28%        | 145  | CP1  | Comptonia peregrina     | Sweet Fern          | 18-24" | #1 Cont. | 4' o.c. centers min. 24" off shoulder |
| 19%        | 100  | KA   | Kalmia angustifolia     | Sheep Laurel        | 2-3'   | #2 Cont. | 3' o.c. centers min. 18" off shoulder |
| 52%        | 270  | VA   | Vaccinium angustifolium | Low sweet blueberry | 12-18" | #2 Cont. | 2' o.c. center min. 12" off shoulder  |
|            | 515  |      |                         |                     |        |          |                                       |

**ZONE 6a: NATIVE PRAIRIE SEED MIX**  
MIX OF NATIVE WILDFLOWERS + NATIVE GRASSES  
MOW ANNUALLY IN FALL TO PREVENT GROWTH OF WOODY VEGETATION

| Zone 6a Native Prairie Seed Mix |      |                                                                        |  |      |                      |  |  |
|---------------------------------|------|------------------------------------------------------------------------|--|------|----------------------|--|--|
| Qty.                            | Code | Seed Mix                                                               |  | Spec | Installation Notes   |  |  |
| 45.6                            | VTM  | Ernst Conservation Seeds Inc. Custom Mix, Mesic to Dry Vermont Meadow* |  | lbs  | Apply 20lbs per acre |  |  |

**ZONE 6b: NATIVE DRY SLOPE PRAIRIE SEED MIX**  
MIX OF NATIVE WILDFLOWERS + NATIVE GRASSES FOR EROSION CONTROL  
MOW ANNUALLY IN FALL TO PREVENT GROWTH OF WOODY VEGETATION

| Zone 6b Dry Slope Prairie Seed Mix |      |                                                                        |  |      |                      |  |  |
|------------------------------------|------|------------------------------------------------------------------------|--|------|----------------------|--|--|
| Qty.                               | Code | Seed Mix                                                               |  | Spec | Installation Notes   |  |  |
| 45.4                               | VTS  | Ernst Conservation Seeds Inc. Custom Mix, Mesic to Dry Vermont Slope** |  | lbs  | Apply 60lbs per acre |  |  |

**ZONE 7: PART SHADE SEED MIX**

| Qty. | Code | Scientific Name                                                        | Common Name | Size | Spec | Installation Notes        |
|------|------|------------------------------------------------------------------------|-------------|------|------|---------------------------|
| 4.25 | FSM  | Vermont Wildflower Farm - Part Shade Roadside Wildflower and Grass Mix |             | lbs  |      | Apply 1/2 lb per 1,000 SF |

**ZONE 8: NATIVE DETENTION AREA GRASSES MIX**  
MIX OF NATIVE GRASSES AND GRASSLIKE SPECIES FORMULATED FOR STORMWATER MANAGEMENT

| Qty. | Code | Seed Mix                                     |  | Size | Spec | Installation Notes       |
|------|------|----------------------------------------------|--|------|------|--------------------------|
| 6.25 | NDA  | Ernst Conservation Native Detention Area Mix |  | n/a  | lbs  | Apply 1/2lb per 1,000 SF |

**ZONE 9 BIRCH & WHITE PINE PRESERVATION AREAS**  
SELECTIVE CLEARING & SEEDING

- 9A - EXISTING PINE TO BE PRESERVED
- 9B & 9C - CLEARING\* AND TREE PROTECTION TO BE REVIEWED AND APPROVED BY CITY ARBORIST AND LAND STEWARD

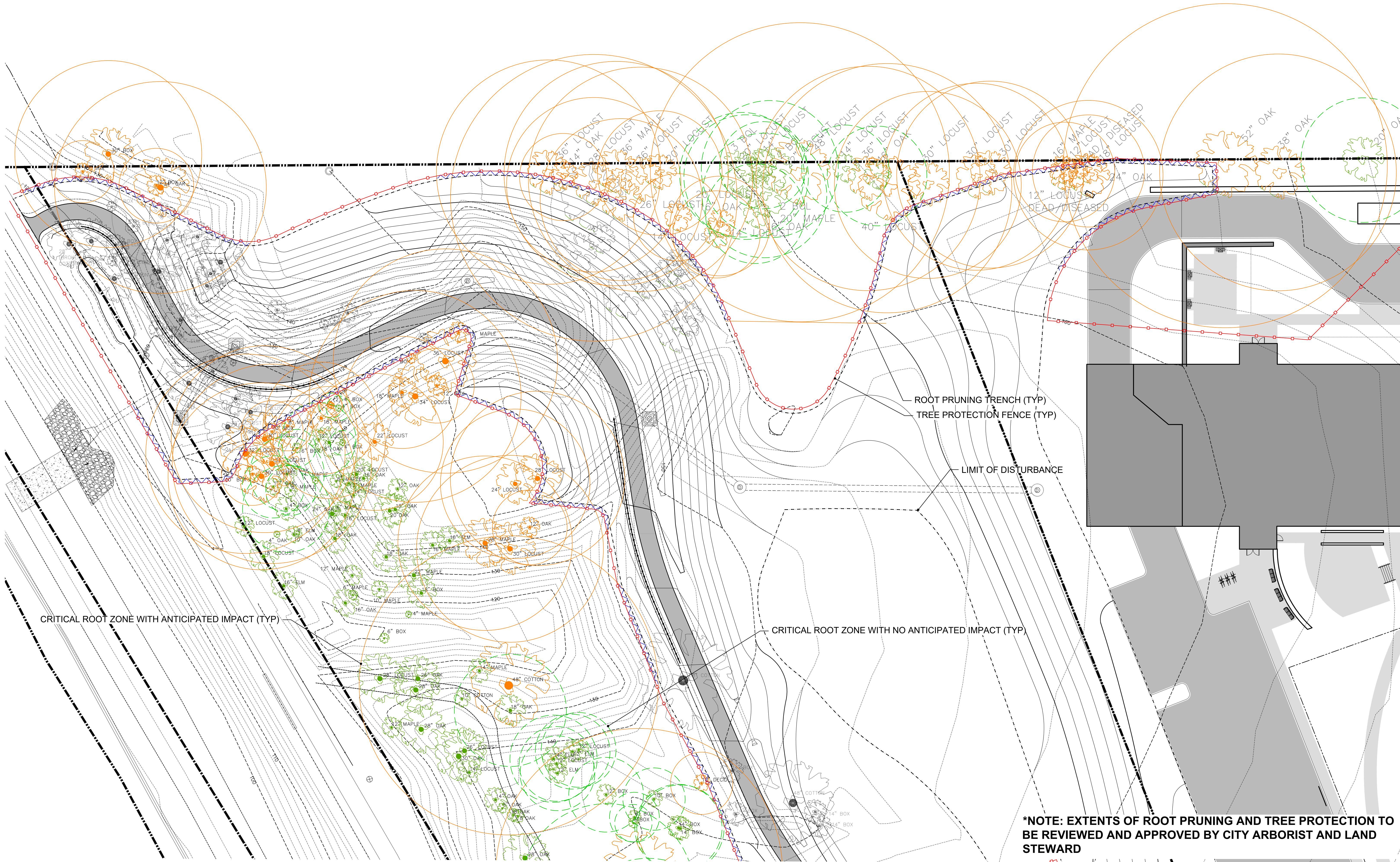
**NOTES:**

\*Zone 6a Native Prairie Seed Mix Composition by %  
Little Bluestem, 33%; Big Bluestem, 33%; Switchgrass 'Blackwell', 10%; Purple Lovegrass, 1%; Deertongue, 8%; Spotted St. Johnswort, 1%; Lanceleaf coreopsis, 2%; Blackeyed Susan, 5%; Blue Vervain, 7%; Golden Alexanders, 7%; New England Aster, 1%; Tall White Beardtongue, 4%; Narrowleaf mountainmint, 3%; Yellow false indigo, 5%; Wild bergamot, 2%; Gray goldenrod, 5%; Common milkweed, 5%; Winkleaf goldenrod, 5%; White goldenrod, 5%; Smooth blue aster, 5%; Roundhead lespedeza, 1.5%; Panicledleaf Ticktrefoil, 1%; Grassleaf goldenrod, 1.5%; Oxeeye Sunflower, 2%; Partridge Oats, 50%; Little Bluestem, 20%; Big Bluestem 'Niagara', 4%; Switchgrass, 4%; Indiangrass, 4%; Purple Lovegrass, 1%; Junegrass, 2%; Butterfly milkweed, 3%; Indianhemp, 1%; Heath aster, 2%; Canadian milkvetch, 1%; Partridge Pea, 3%; Pale purple coneflower, 3%; Early goldenrod, 5%; Gray goldenrod, 5%

\*\*Zone 6b Dry Slope Prairie Seed Mix Composition by %  
Little Bluestem, 33%; Big Bluestem, 33%; Switchgrass, 10%; Purple Lovegrass, 1%; Deertongue, 8%; Spotted St. Johnswort, 1%; Lanceleaf coreopsis, 2%; Blackeyed Susan, 5%; Blue Vervain, 7%; Golden Alexanders, 7%; New England Aster, 1%; Tall White Beardtongue, 4%; Narrowleaf mountainmint, 3%; Yellow false indigo, 5%; Wild bergamot, 2%; Gray goldenrod, 5%; Common milkweed, 5%; Winkleaf goldenrod, 5%; White goldenrod, 5%; Smooth blue aster, 5%; Roundhead lespedeza, 1.5%; Panicledleaf Ticktrefoil, 1%; Grassleaf goldenrod, 1.5%; Oxeeye Sunflower, 2%; Partridge Oats, 50%; Little Bluestem, 20%; Big Bluestem 'Niagara', 4%; Switchgrass, 4%; Indiangrass, 4%; Purple Lovegrass, 1%; Junegrass, 2%; Butterfly milkweed, 3%; Indianhemp, 1%; Heath aster, 2%; Canadian milkvetch, 1%; Partridge Pea, 3%; Pale purple coneflower, 3%; Early goldenrod, 5%; Gray goldenrod, 5%

- REMOVAL OF TREES TO BE COORDINATED WITH A BAT HABITAT SPECIALIST.





**\*NOTE: EXTENTS OF ROOT PRUNING AND TREE PROTECTION TO BE REVIEWED AND APPROVED BY CITY ARBORIST AND LAND STEWARD**



| DATE: JULY 19, 2024 | DATE | REVISION |
|---------------------|------|----------|
|                     |      |          |





**T.J. BOYLE ASSOCIATES**  
LANDSCAPE ARCHITECTURE & PLANNING

SCALE: 1" = 20'  
0 10' 20' 40'

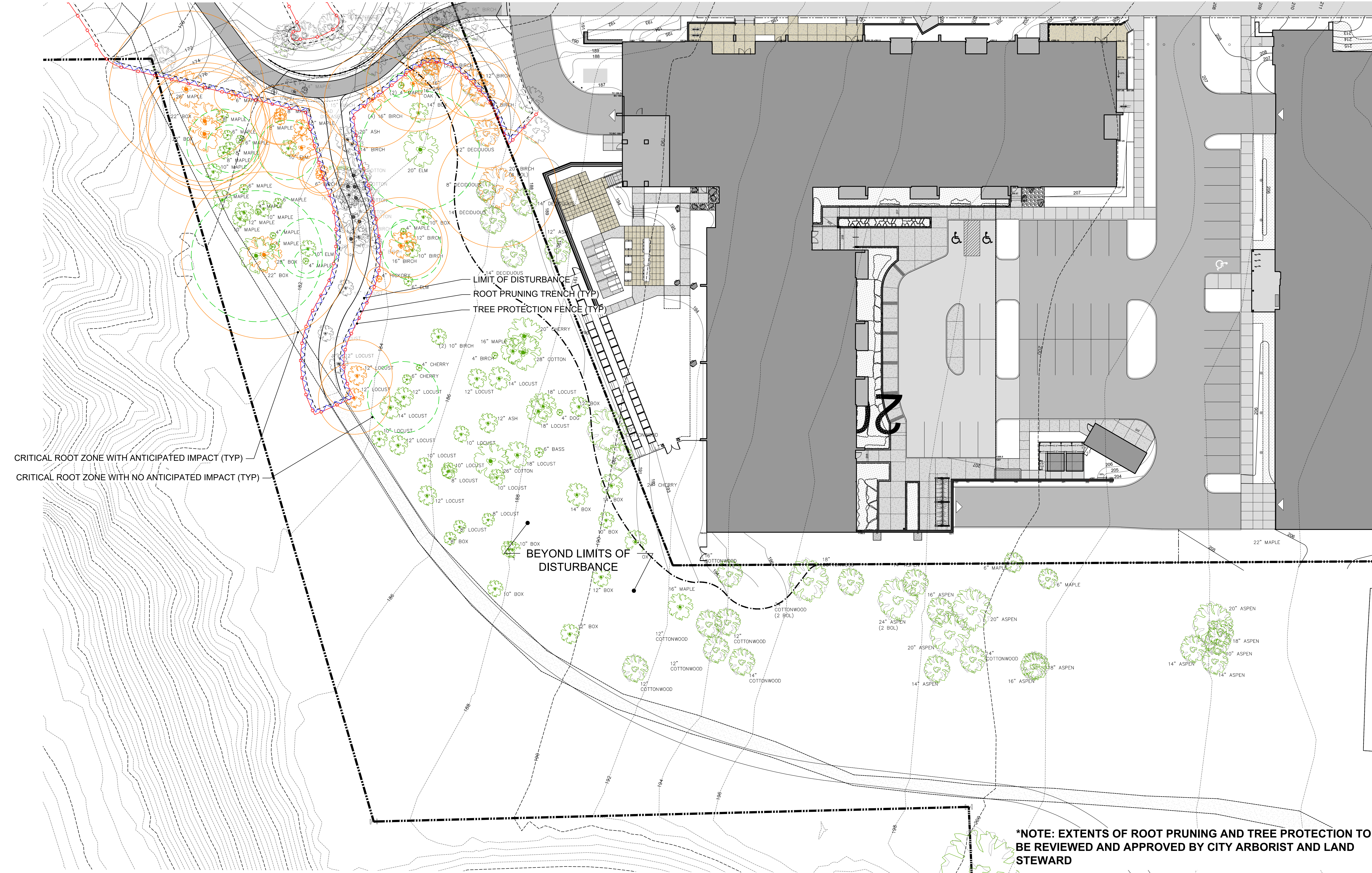


| DATE: JULY 19, 2024 | DATE | REVISION |
|---------------------|------|----------|
|                     |      |          |

## KIESLICH PARK MULTI-USE PATH

TREE PROTECTION PLAN SHEET L1.4





CRITICAL ROOT ZONE WITH ANTICIPATED IMPACT (TYP)  
CRITICAL ROOT ZONE WITH NO ANTICIPATED IMPACT (TYP)

LIMIT OF DISTURBANCE  
ROOT PRUNING TRENCH (TYP)  
TREE PROTECTION FENCE (TYP)

BEYOND LIMITS OF  
DISTURBANCE

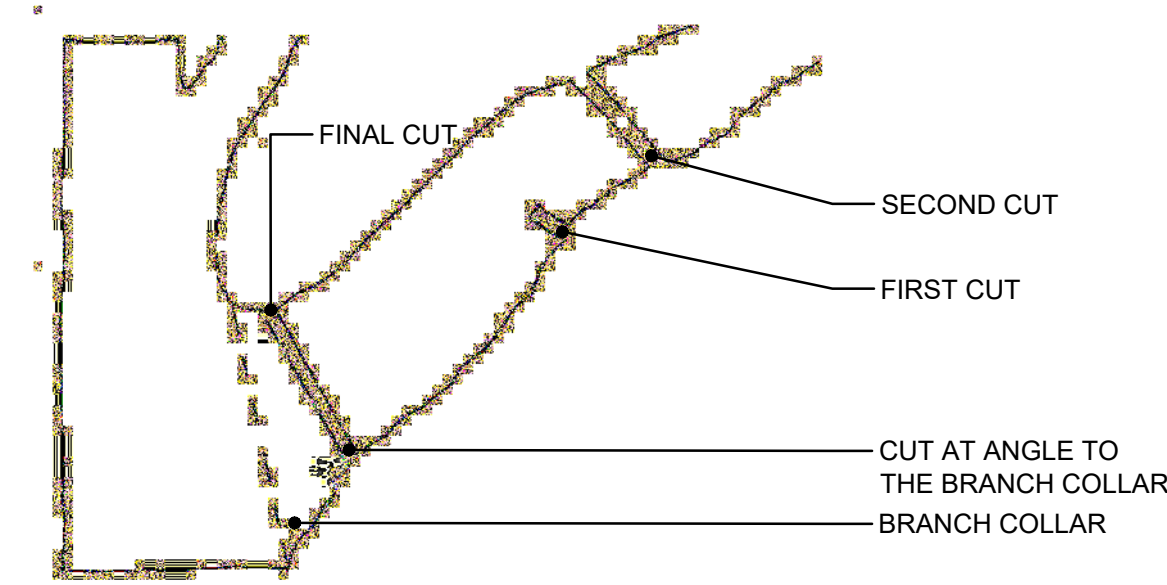
\*NOTE: EXTENTS OF ROOT PRUNING AND TREE PROTECTION TO  
BE REVIEWED AND APPROVED BY CITY ARBORIST AND LAND  
STEWARD

| DATE: JULY 19, 2024 | DATE | REVISION |
|---------------------|------|----------|
|                     |      |          |



TREE PRUNING NOTES:

- REFER TO ANSI A300 (Part 1, MOST UPDATED VERSION) PRUNING SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- WORK SHOULD BE PREFORMED BY A CERTIFIED ARBORIST OR PROFESSIONAL TREE COMPANY.
- AVOID DAMAGING BARK AND OTHER LIVING TISSUE THROUGHOUT THE PRUNING PROCESS.
- MAKE SURE PRUNING TOOLS ARE SHARP.
- MAKE CLEAN CUT AS CLOSE TO THE BRANCH COLLAR AS POSSIBLE. DO NOT LEAVE A STUB.
- REDUCE THE SIZE OF THE BRANCH FOR A BETTER CUT.
- THE FIRST AND SECOND CUTS SHOULD BISECT THE ANGLE BETWEEN ITS BRANCH BARK RIDGE AND AN IMAGINARY LINE PERPENDICULAR TO THE BRANCH OR STEM.
- NOT MORE THAN 25% OF GROWTH SHOULD BE REMOVED FROM A CANOPY DURING A GROWING SEASON.



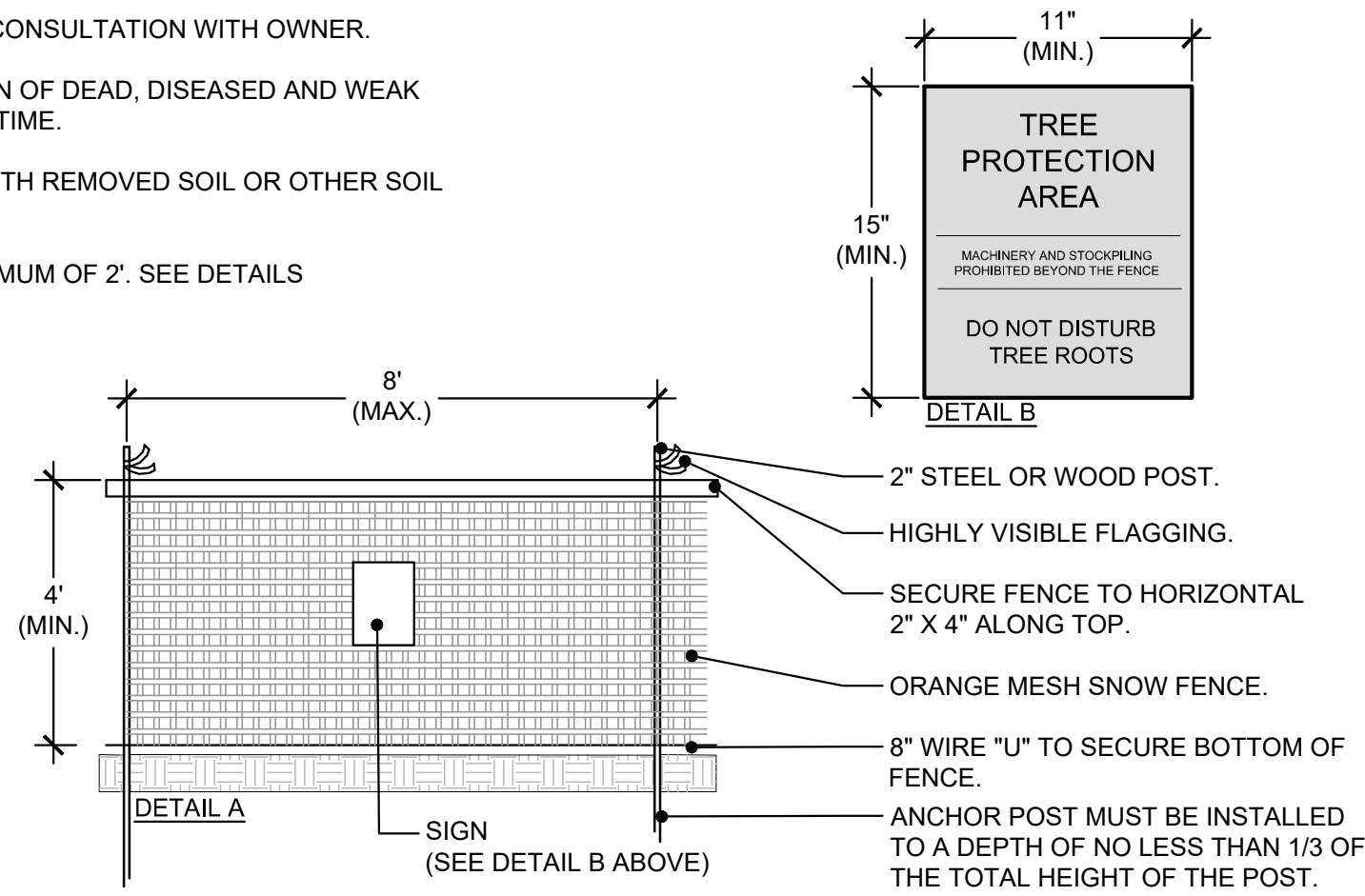
1 TREE PRUNING ILLUSTRATION  
L2.0 NTS

TREE PROTECTION NOTES:

- PRIOR TO ANY CONSTRUCTION ACTIVITY, ALL TREE PRESERVATION MEASURES MUST BE IMPLEMENTED.
- CONTRACTOR CHOSEN FOR THIS WORK WILL BE AN EXPERIENCED TREE SERVICE FIRM THAT HAS SUCCESSFULLY COMPLETED TREE PROTECTION, ROOT PRUNING, AND TRIMMING WORK, SIMILAR TO THAT REQUIRED FOR THIS PROJECT.
- PRIOR TO CONSTRUCTION SHALL LOCATE AND VERIFY THE EXISTENCE OF ALL UTILITIES PRIOR TO STARTING WORK. CONTACT DIG SAFE TWO FULL BUSINESS DAYS BEFORE PLANTING. (48 HOUR MIN.)
- PRIOR TO THE SITE VISIT ALL TREE PRESERVATION AREAS SHALL BE STAKED OUT ON SITE BY SURVEY.
- TREE PROTECTION FENCING SHALL REMAIN INTACT THROUGHOUT ALL CONSTRUCTION ACTIVITY.
- THERE WILL BE NO EXCAVATION FOR PROPOSED SITE WORK WITHIN FENCED AREA.
- NO MATERIALS OR EQUIPMENT SHALL BE STORED, STOCKPILED OR OPERATED WITHIN TREE PROTECTION AREAS.
- TREE PROTECTED AREAS WILL BE LEFT AS NATURAL AS POSSIBLE.
- IN AREAS OF EXCAVATION NEAR TREE, IDENTIFY AND CUT ROOTS IN CONSULTATION WITH OWNER.
- REMOVE POORLY ATTACHED AND RUBBING LIMBS. CLEAN THE CROWN OF DEAD, DISEASED AND WEAK LIMBS. THINNING OF HEALTHY LIMBS IS NOT RECOMMENDED AT THIS TIME.
- ANY NECESSARY TRENCHING SHALL BE IMMEDIATELY BACKFILLED WITH REMOVED SOIL OR OTHER SOIL MIX AS DESCRIBED IN CONTRACT SPECIFICATIONS.
- AN AIR SPADE/AIR KNIFE IS TO BE USED TO EXCAVATE DOWN TO MINIMUM OF 2". SEE DETAILS

SIGN DETAIL:

- ATTACHMENTS OF SIGNS TO TREES IS PROHIBITED.
- SIGNS SHOULD BE MADE OF VINYL OR PLASTIC.
- SIGNS SHOULD BE PROPERLY MAINTAINED, PENALTIES WILL BE ENFORCED FOR REMOVAL OF SIGNS.
- AVOID INJURY TO ROOTS WHEN PLACING POSTS FOR THE SIGNS.
- SIGNS SHOULD BE POSTED 50' O.C. AND WITHIN 20' OF THE BEGINNING AND END OF EACH FENCE TO BE VISIBLE TO ALL CONSTRUCTION PERSONNEL.
- SIGNS TO BE SECURELY FASTENED TO THE FENCE OR FENCE POSTS.
- SIGNS TO HAVE A WHITE BACKGROUND AND ORANGE OR RED TEXT.

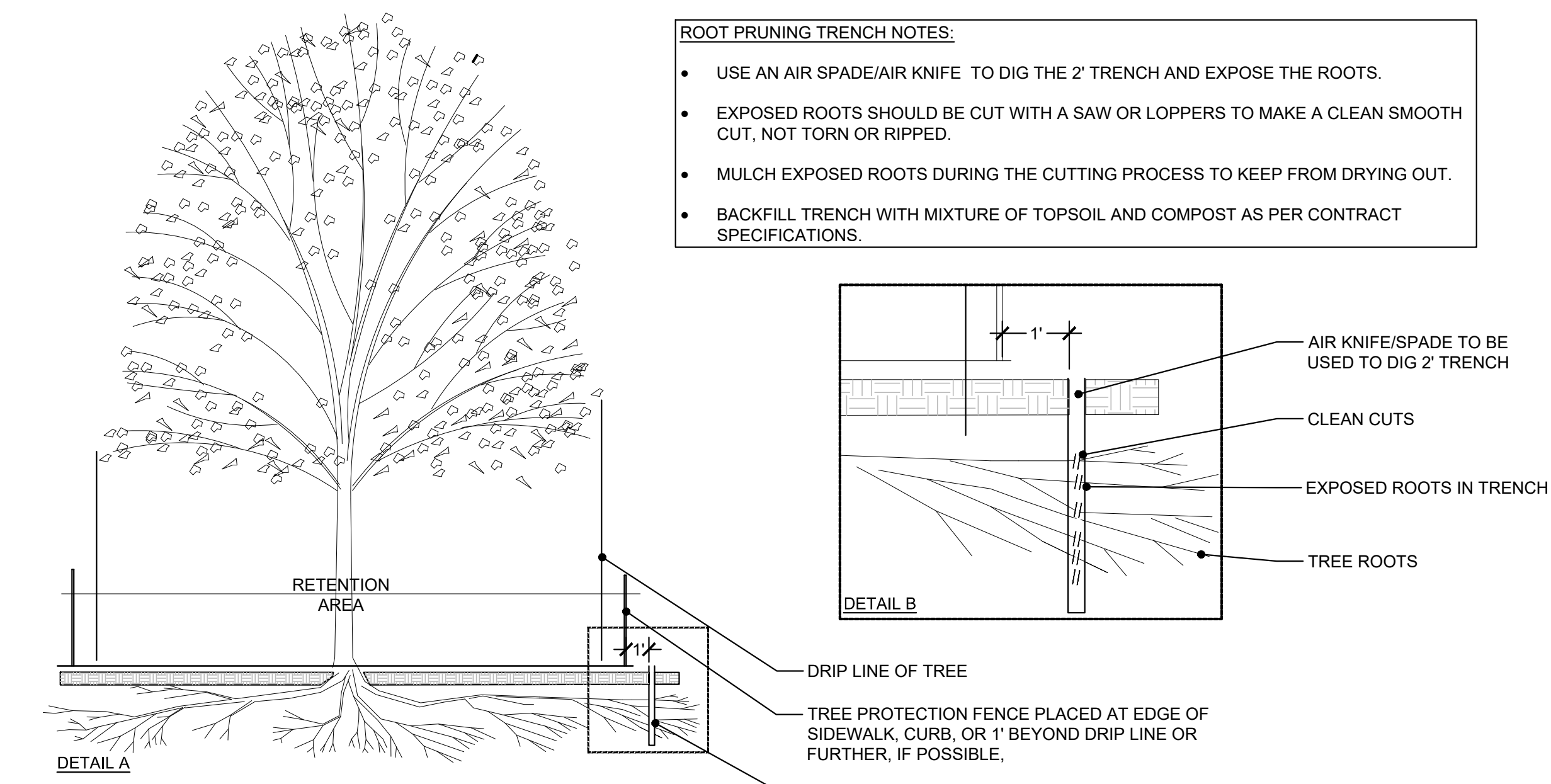


- FENCE DETAIL:
- THIS FENCE SERVES AS A TREE PROTECTION DEVICE ONLY.
  - ROOT DAMAGE SHALL BE AVOIDED WITHIN FENCED AREA.
  - FENCE SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.

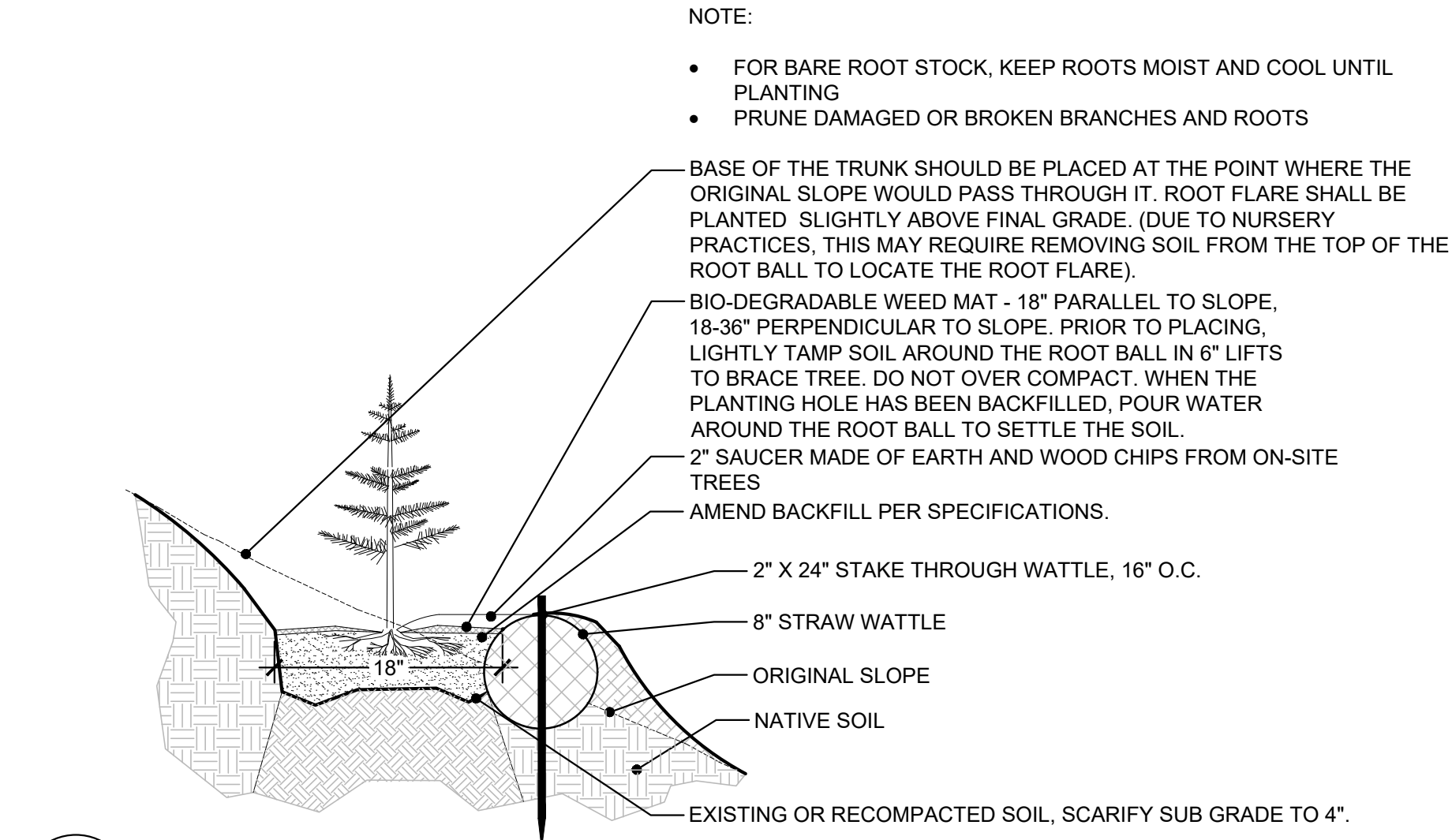
2 TREE PROTECTION FENCE  
L2.0 NTS

ROOT PRUNING TRENCH NOTES:

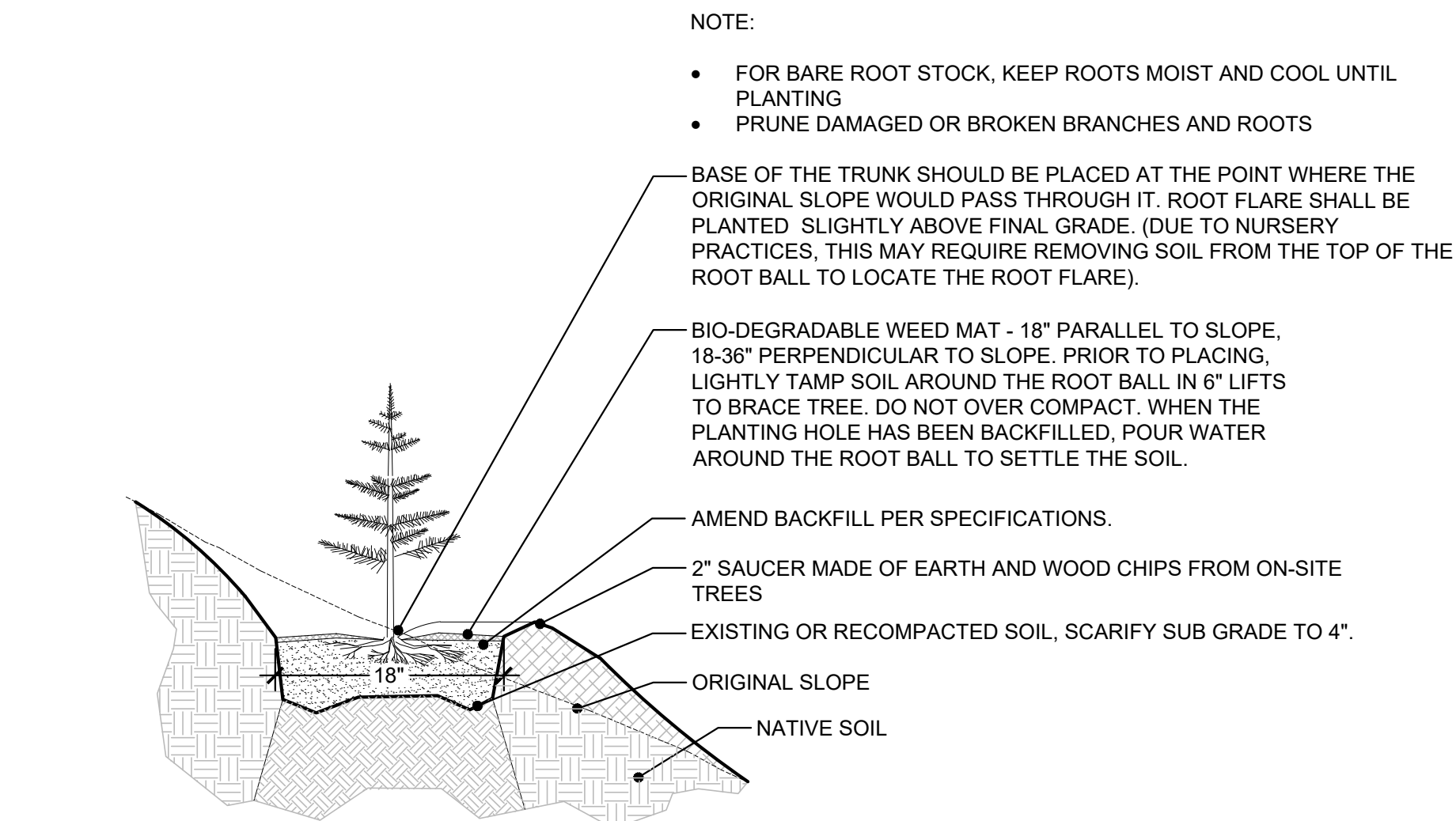
- USE AN AIR SPADE/AIR KNIFE TO DIG THE 2' TRENCH AND EXPOSE THE ROOTS.
- EXPOSED ROOTS SHOULD BE CUT WITH A SAW OR LOPPERS TO MAKE A CLEAN SMOOTH CUT, NOT TORN OR RIPPED.
- MULCH EXPOSED ROOTS DURING THE CUTTING PROCESS TO KEEP FROM DRYING OUT.
- BACKFILL TRENCH WITH MIXTURE OF TOPSOIL AND COMPOST AS PER CONTRACT SPECIFICATIONS.



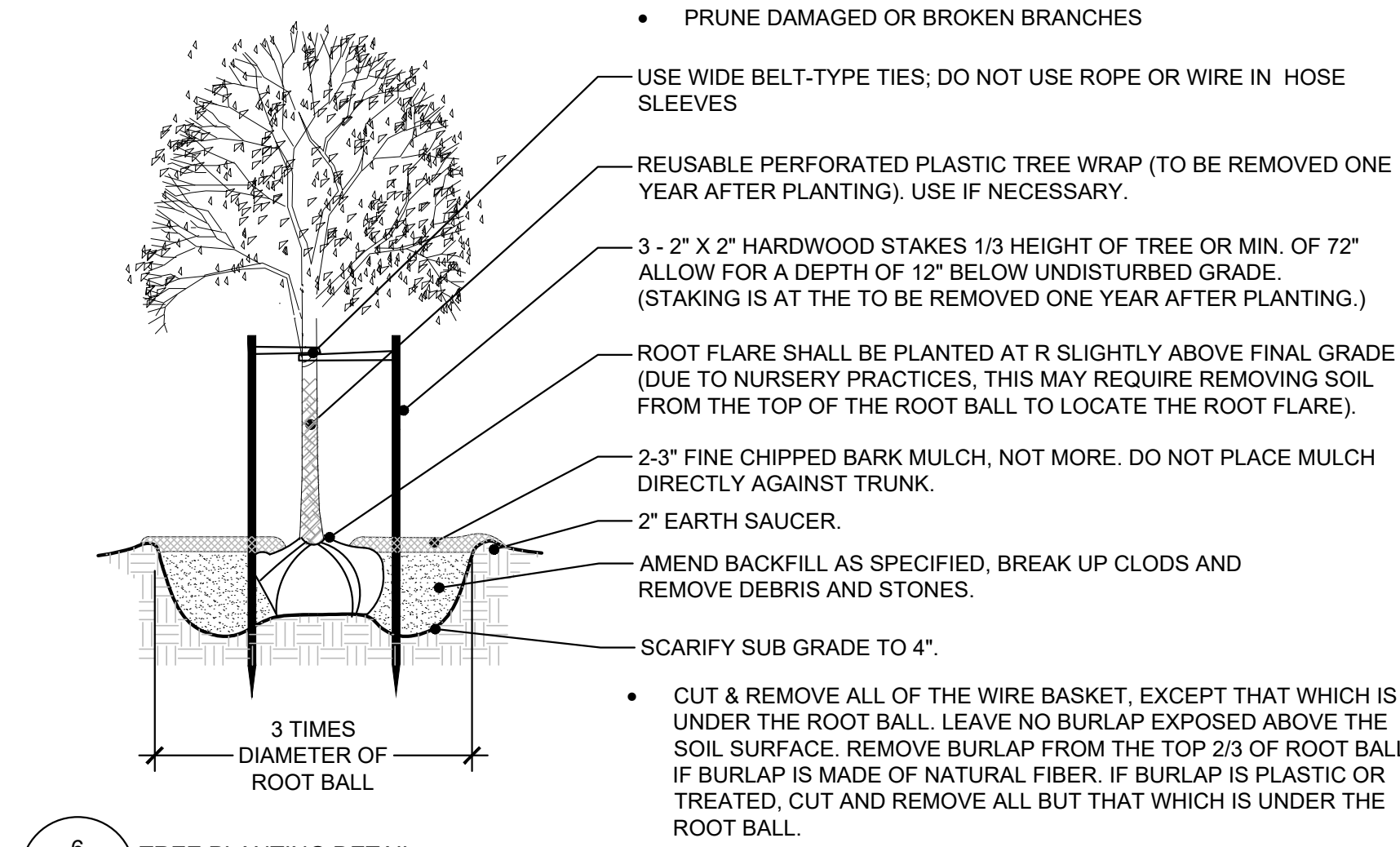
3 TREE PROTECTION  
L2.0 NTS



4 SMALL TREE PLANTING ON STEEP SLOPE DETAIL - COIR LOG SAUCER OPTION  
L2.0 NTS



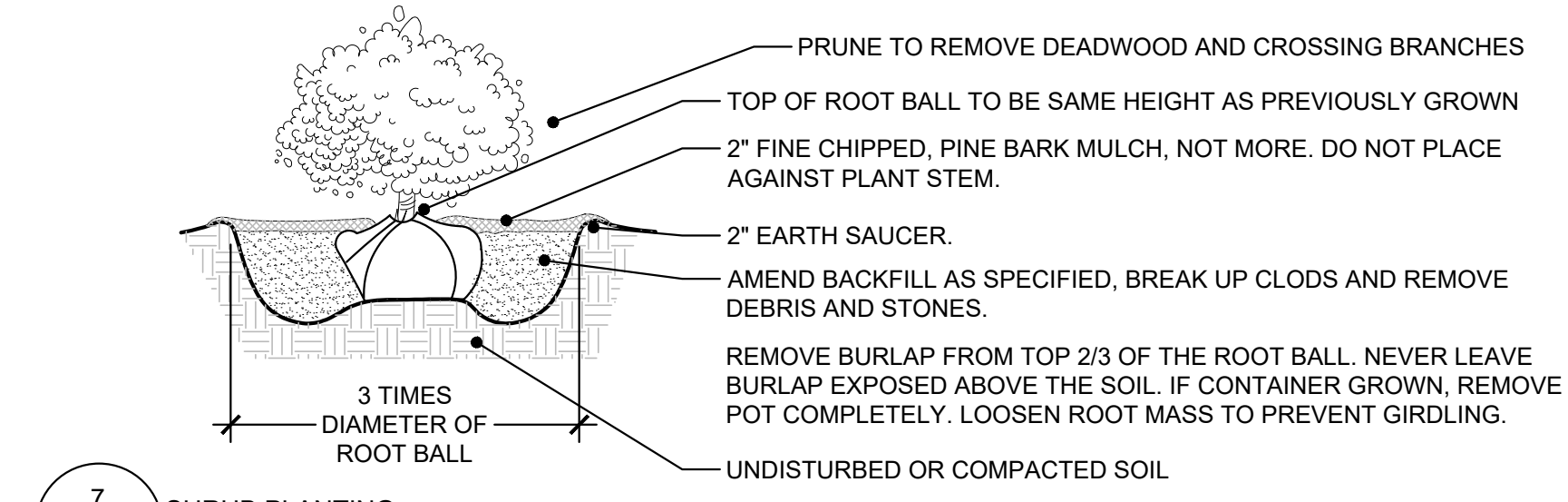
5 SMALL TREE PLANTING ON STEEP SLOPE DETAIL - ON-SITE WOOD CHIP SAUCER OPTION  
L2.0 NTS



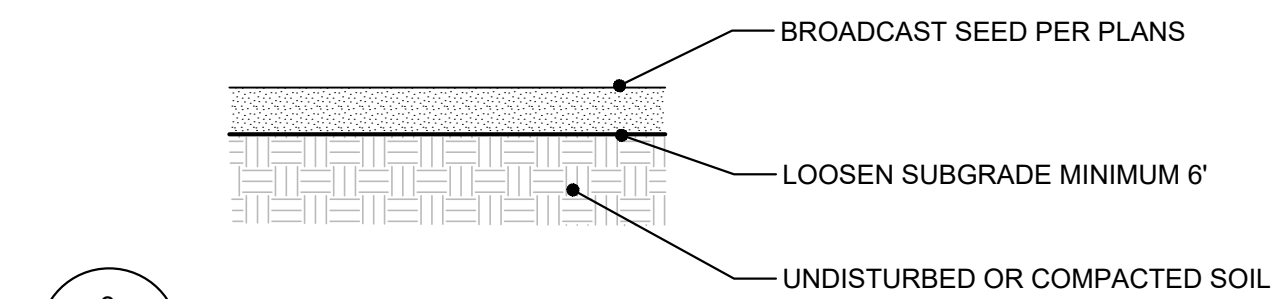
6 TREE PLANTING DETAIL  
L2.0 NTS

GENERAL PLANTING NOTES:

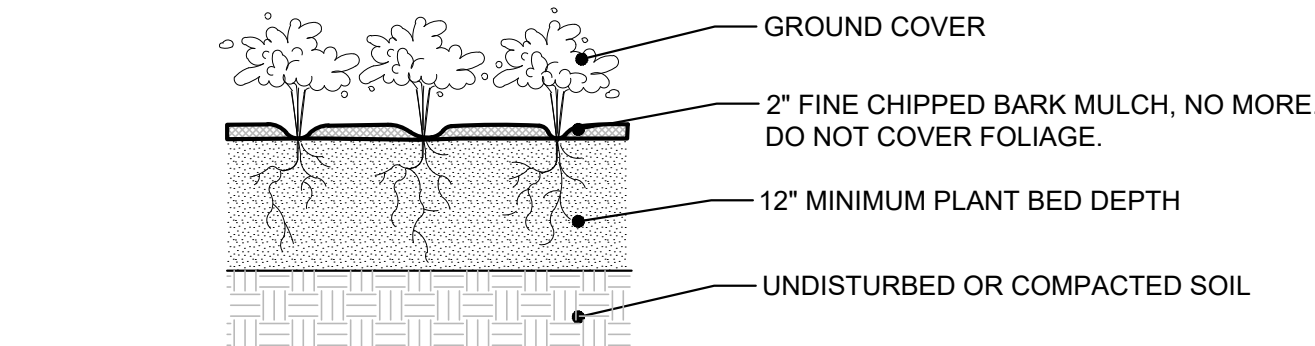
- THE LANDSCAPE CONTRACTOR SHALL LOCATE AND VERIFY THE EXISTENCE OF ALL UTILITIES PRIOR TO STARTING WORK. CONTACT DIG SAFE TWO FULL BUSINESS DAYS BEFORE PLANTING. (48 HOUR MIN.)
- THE LANDSCAPE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIAL IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTING SHOWN ON ALL DRAWINGS. THE PLAN QUANTITIES SHALL ALWAYS SUPERCEDE THE PLANT LIST.
- ALL PLANT MATERIAL SHALL CONFORM AND BE INSTALLED TO THE GUIDELINES ESTABLISHED BY THE CURRENT ANSI Z60.1.
- NO PLANT SHALL BE PUT INTO THE GROUND BEFORE ROUGH GRADING HAS BEEN FINISHED AND APPROVED BY THE PROJECT LANDSCAPE ARCHITECT OR EQUAL.
- REFER TO THE SOIL SPECIFICATIONS FOR PLANTING SOIL REQUIREMENTS.
- THE LANDSCAPE CONTRACTOR SHALL PROVIDE AMENDED PLANTING SOIL AS PER THE CONTRACT SPECIFICATIONS.
- NO CONTAINER GROWN STOCK WILL BE ACCEPTED IF IT IS ROOT BOUND. ALL ROOT WRAPPING MATERIAL MADE OF SYNTHETICS OR PLASTICS SHALL BE REMOVED AT THE TIME OF PLANTING.
- WITH CONTAINER GROWN STOCK, THE ROOT BALL SHALL BE CUT THROUGH THE SURFACE IN TWO VERTICAL LOCATIONS.
- STAKING PLANTS IS AT THE DISCRETION OF THE LANDSCAPE CONTRACTOR. ONLY STAKE PLANTS IN THE MANNER SPECIFIED IN THE PLANTING DETAILS.
- ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24 HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL THEN BE WATERED WEEKLY, IF NECESSARY, DURING THE FIRST GROWING SEASON.
- THE LANDSCAPE CONTRACTOR SHALL REFER TO THE CONTRACT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- THE LANDSCAPE CONTRACTOR SHALL REFER TO THE PLANT LIST FOR SEASONAL REQUIREMENTS RELATED TO THE TIME OF PLANTING.



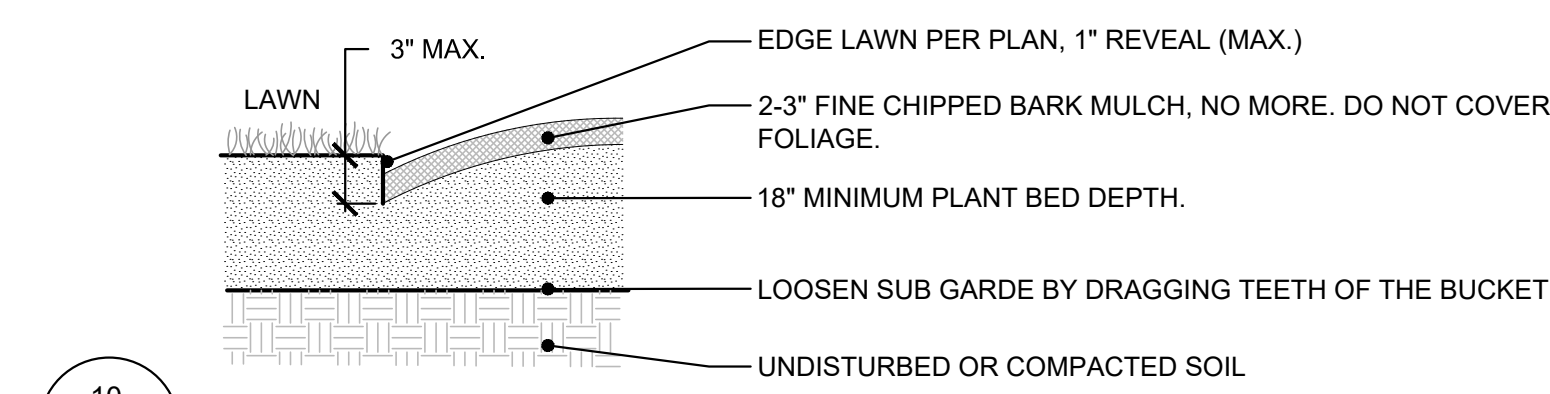
7 SHRUB PLANTING  
L2.0 NTS



8 SEEDING AREA  
L2.0 NTS



9 GROUNDCOVER PLANTING  
L2.0 NTS



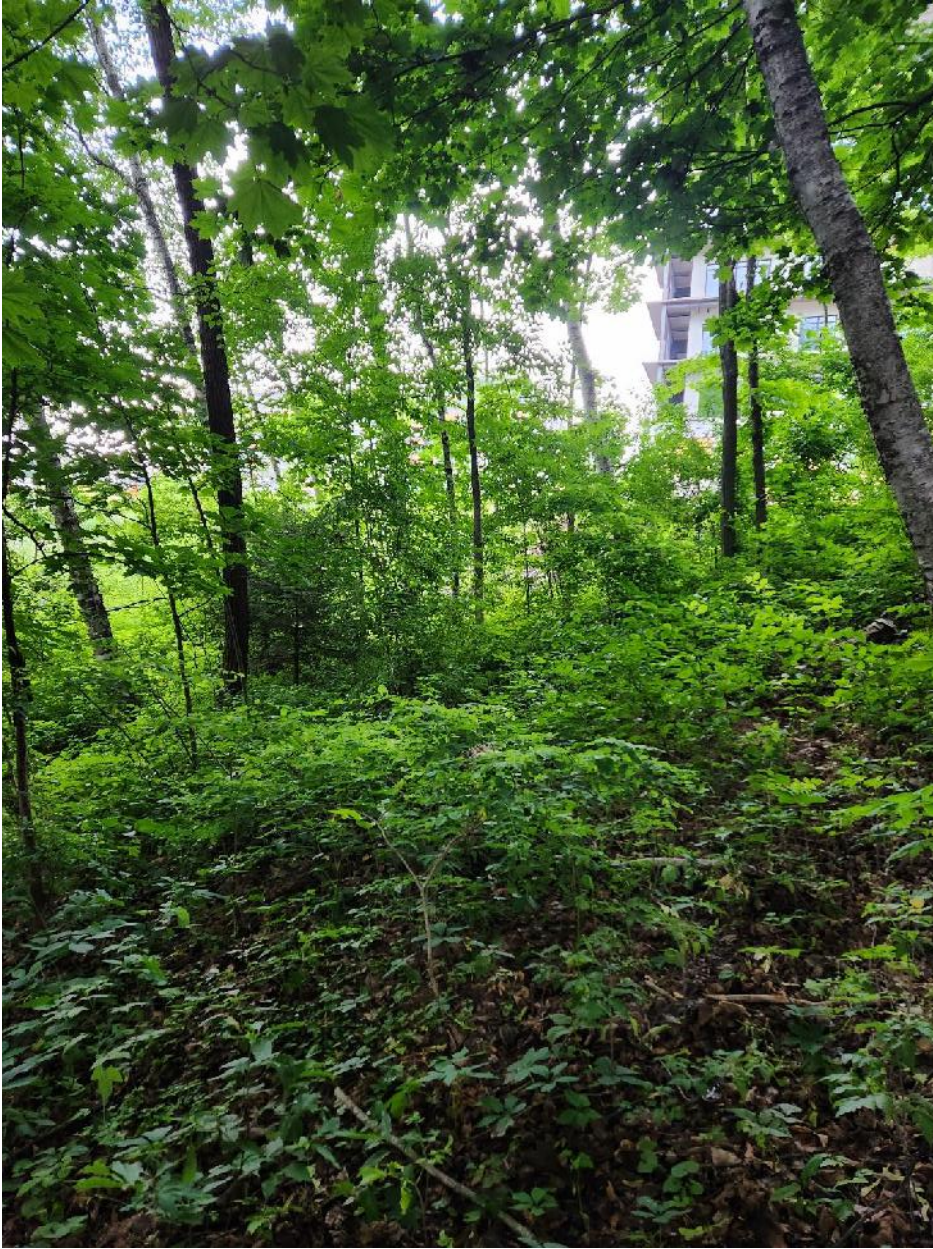
10 MULCHED PLANT BED  
L2.0 NTS





Uphill opening of existing culvert.





View of approximate South connection









Eroding area at top of hill





Erosion of existing path





Erosion of existing path





Erosion washing into bike path





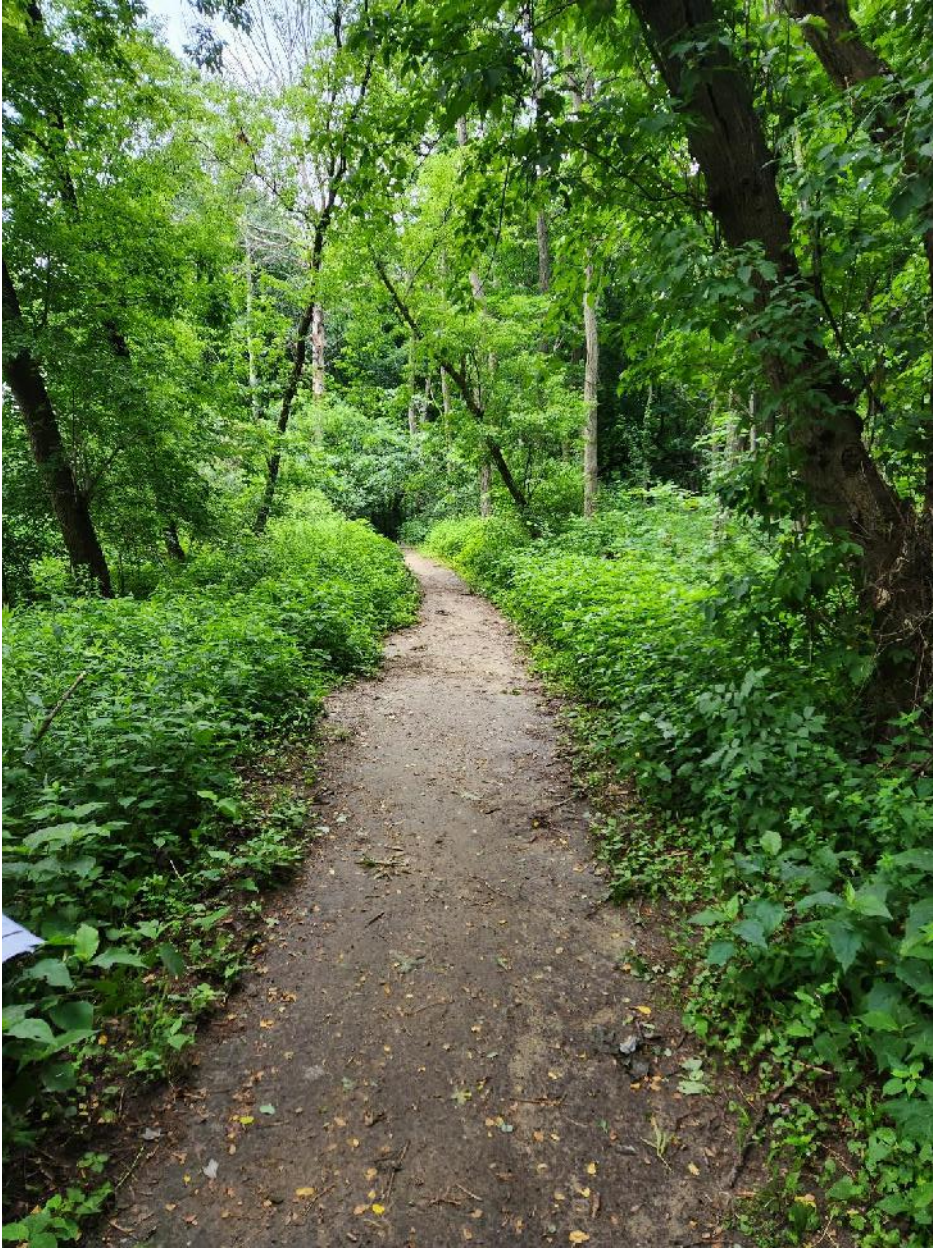
Existing culvert outlet





Existing Northwest View





Existing Path, South view





Existing Southwest view





Path erosion





Existing path, steep section erosion





Steep gradient, view from bike path















|                                                                                       |                                        |
|---------------------------------------------------------------------------------------|----------------------------------------|
|    | DISCHARGE POINT                        |
|    | SUBCATCHMENT I.D.                      |
|    | STRUCTURAL TREATMENT PRACTICE I.D.     |
|    | PROPOSED STORMWATER TREATMENT PRACTICE |
|    | PROPOSED STORMWATER PRE-TREATMENT      |
|    | PROPOSED SIMPLE DISCONNECTION          |
|  | NCRS SOIL BOUNDARIES                   |



Not Approved for Construction  
Drawing Title

**Post-Construction  
Stormwater Management  
Plan**

# SW-1

Project Number  
**7848.00**







## **Kieslich Park Mixed-Use Path**

### **Post Construction Stormwater Management Summary**

#### **Existing Conditions**

Land cover in the northern and western portion of Kieslich Park consists of a combination of meadow, regenerating forest, and mature wooded areas. Above the steep bluff, land slopes range from 3% to 20% sloping downward to the west. Soils underlying this area are mapped as Adams and Windsor Loamy Sands, which have been assigned to Hydrologic Soils Group "A", which are characterized by high infiltration rates and low runoff potential. During smaller rainfall events, precipitation infiltrates into the underlying sandy soils. During larger events where surface runoff may be generated, runoff travels west by sheet flow across the existing meadow areas and overland down the bluff either by sheet flow or at several concentrated flow points along the bluff before crossing under the bike path in three culverts which outlet directly to Lake Champlain.

#### **Proposed Conditions**

Vegetation will be retained and managed to the extent feasible to mimic existing runoff generation as much as possible. Runoff from park areas east of the path, and from the path itself, will generally be collected in open channel treatment practices. These practices consist of four Dry Swales (STPs 1 through 4) as shown on the accompanying Sheet SW-1 by VHB, dated July 19, 2024. Pretreatment for the Dry Swales consists of either grass channels or use of filter strips. The Dry Swales have been designed to infiltrate the Water Quality Treatment Volume (first inch of runoff in a 24-hour period). Overflow from these channels is routed into a new 36-inch diameter stormwater line that will pass under the bike path and adjacent to the existing outfall at discharge Point S/N 001. Runoff from miscellaneous path surfaces that cannot be routed to the dry swales is treated via sheet flow to adjacent vegetated disconnection areas. The stormwater management system has been designed in accordance with the DEC 2017 Stormwater Management Manual and will be seeking coverage under General Permit 3-9050. The path results in 20,386 SF (0.468 acre) of new impervious surface on the parcel.

In addition to the localized infiltrative treatment provided by the proposed stormwater practices described above, the swale collection system will route runoff to the proposed pipe for stable conveyance down the bluff, and will significantly reduce overland flow across the bluff, thereby reducing erosion potential and existing sediment discharge to the bike path area and ultimately to Lake Champlain.







Cambrian Rise Multiuse Path Landscape and Civil Plan Notes for  
8/5/24 Meeting of Burlington Conservation Commission

Plant and seed selection clarifications and suggestions to ensure long term success.

C 3.4 plan page

Section 02936, Part 2.03. **Clarification for the permit:** purpose of the three seed mixes specced here.

- When and where would these “Civil Plan seed mixes” be used since different seed mixes are specced in the Landscape Plan pages? Or is this “canned engineer-ese” and they’re only using the seed mixes in the Landscape Plan?
- **\*\*Critical concern/concept:** excluding intentional lawn areas, we must request regional native plant species (except for temporary nurse crop species) and NO invasive species.
- **The Shade Mix has crown vetch listed, a known problematic invasive that spreads and displaces native flora.**

L 1.1 plan page

- **Zones 1 and 2:** What is the “Erosion Control Seed Mix Per Civil Plans” mentioned in? **Please clarify this for the permit. The Civil Plan seed mixes are for “low mow lawn scenarios” with very low plant diversity (3-4 species) of Eurasian species.** The specced Zone 7 Vermont Wildflower Farm Part Shade Roadside Wildflower and Grass Seed Mix would work well. From a design perspective, it would provide a unifying theme and the species will eventually self-select for their favored conditions.
- **Zone 4: Forest Edge Shrub Planting.** Replace the **Salix discolor** with a species that tolerates dry to medium soils in part shade. Suggestions: **maple leaf viburnum/Viburnum acerifolium** and **black chokeberry/Aronia melanocarpa.**
- **Zone 10: Dry Swale:** This planting will succeed to a meadow “look” of the most competitive plants: the bracken fern, grass leaved goldenrod, Joe Pye weed alternative, calico aster and golden alexander. The columbine, if retained, will be showy for a couple of years, then be shaded out and disappear. A replacement is suggested below. Expect the cardinal flower to be short-lived but it could seed itself around in nearby soil openings.  
**Suggested replacements:**
  - Blue cohosh/Caulophyllum thalictroides (a humus soil forest plant) with **Golden Alexander/Zizia aurea**
  - Red columbine/Aquilegia canadensis (won’t survive the plant competition long term) with **calico aster/Symphyotrichum lateriflorum.**
  - Cup plant/Silphium perfoliatum (though a prairie native, it can become locally invasive) with spotted **Joe Pye Weed/Eutrochium maculatum.**