



City of Biddeford Planning Board

August 7, 2024 at 6:00 PM
City Hall Council Chambers & Zoom

<https://biddeford.zoom.us/j/91621088534?pwd=Tk5yRGtIbIZ0eHEzTElSdGhKb3VuQT09>

Or call in by phone: +1 312 626 6799
Meeting ID: 9116 2108 8534
Passcode: 276637

1. Pledge of Allegiance
2. Declaration of Quorum/Voting Members
3. Adjustment(s) to Agenda
4. Planner's Business
5. Consent Agenda
 - 5.a Approval of Meeting Minutes from July 17 & 24, 2024
6. Open Public Hearing
 - 6.a 2024.43 Ordinance Amendment to the City Code of Ordinances, Part III: Land Development Regulations, Article V: Establishment of Zone, Section 11 – Establishment of Zones – Item V Attachment 1, Table A - Modification to allow Multi-family Developments, with conditions, within the I-3 zoning District
7. Close Public Hearing
8. Unfinished Business
9. New Business
 - 9.a **THIS ITEM HAS BEEN POSTPONED BY THE APPLICANT**
2024.40 The Planning Board will review and take questions regarding a request from Mike Richards to lift the existing house at 42 Mile Stretch Road to replace the foundation with concrete piers in the exact location. The house is owned by The Josee Truchon Trust, Voilane Marcoux Trustee. The property is on tax map 62, lot 7 and in the CR zone.
 - 9.b **THIS ITEM HAS BEEN POSTPONED UNTIL AUGUST 21, 2024**

2024.35 The Planning Board will review a Conditional Use Permit request from Christine Biyoga to open a day care facility in her home located at 25 Green Street, Tax Map 9, Lot 38 in the MSRD-2 Zone.

9.c 2024.17 The Biddeford Planning Board will review and discuss a Final Plan submitted by Indian Cliff Development for an 9 lot subdivision. The project is located on Barra Road (Tax Map 7, Lot 15) in the R-3 zone. One lot of this project is for AVESTA Housing.

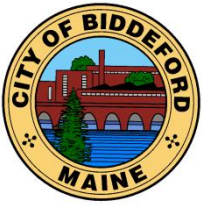
9.d 2024.17 The Biddeford Planning Board will review and discuss a Final Plan submitted by AVESTA Housing for a 46 unit affordable housing project for the elderly. The project is located on Barra Road (Tax Map 7, Lot 15) in the R-3 zone. The lot for this project is one of the proposed lots in the subdivision for Indian Cliff Development.

9.e 2024.29 The Biddeford Planning Board will review and take comments for a Final application for Site Plan/Subdivision for Westbrook Development Corporation. The property is 37 Barra Road (Tax Map 2, P/O Lot 42) in the I3 Zone.

10. Other Business

11. Adjourn

The Board reserves the right to halt official business at 9:30 p.m. Items not heard at tonight's meeting shall be rescheduled to the next meeting of the Board. All materials pertaining to items on the agenda are available for public review at the Biddeford Planning Department, second floor, Biddeford City Hall during normal business hours.



CITY OF BIDDEFORD

Planning and Development Department

205 Main Street
P.O. Box 586
Biddeford, ME 04005
(207) 284-9115

Planning Board Meeting

Meeting Minutes

DRAFT

Date: July 17, 2024
Time: 6:00 PM
Location: Council Chambers & Zoom

1. Pledge of Allegiance
2. Declaration of Quorum/Voting Members: Larry Patoine (Chair), Susan Deschambault, Roch Angers, Steve Beaudette & Matt Dubois (Alternate Member)
Staff Present: David Galbraith & Adi Iriqat
Guest: Attorney Harry Center
Matt Dubois will vote tonight in the absence of Alexa Plotkin
Chair Patoine opened the meeting at 6:00 PM
3. Adjustments to the Agenda-none
4. Executive Session Vote for Executive Session: Motion-Beaudette, Second-Anger-Motion passed unanimously
5. Planner's Business-
 - 2024.38 Introduction of Proposed Amendment to Marijuana Ordinance, Galbraith announced that this will come to Planning Board on next agenda
 - Patoine would like to add public park or golf course added
 - Deschambault confirmed that this came from a City Counselor, Galbraith agreed. She is concerned about local control being more restricted than the state had intended.
 - Galbraith announced that Alexa & Amy welcomed Avis Elizabeth
6. Consent Agenda
 - 6.a Approval of Meeting Minutes from June 5 & 26, 2024
Motions: Beaudette-Motion that the meeting minutes from June 5 & 26, 2024 be approved
Second-Deschambault
Motion passed 3-0-1 (Deschambault, Beaudette, Dubois in favor, Angers abstained)
7. Open Public Hearing
8. Close Public Hearing
9. Unfinished Business
10. New Business
 - 10.a 2024.32 Public Meeting and take comments to review a Sketch Plan Subdivision Application for Coastal Oaks, LLC. The property is located at 512 Pool Street (Tax Map 9, Lot 31) in the RF & SR-1 Zones. The applicants propose constructing a subdivision containing 8 single family homes.
 - Galbraith introduced the project

- King Weinstein and Ethan Scott represented the applicant
- Water line will run under Pool Street
- No Public Comments
- Patoine mentioned many things need to be cleaned up from Peer Review
- Typos in Staff Review will be corrected for Preliminary
- Dubois Item #4 relocation of drive way-why required? Safety Issue
- No other questions from the Board

10.b 2024.33 Review a Sketch Plan Subdivision Application for Coastal Oaks, LLC. The property is located at 12 Pearl Street (Tax Map 40, Lot 72) in the MSRD-1 Zone. The applicants propose to convert the existing vacant building into 25± apartments.

- Iriqat introduced this project
- This will need Historic Preservation Approval
- Ethan Scott & King Weinstein represented the applicant
- Looking to add 4th floor within historic approvals
- Scott will keep the historic context of building
- They would like to incorporate glass and steel on the corner to have like an atrium
- No Public Comments
- Deschambault-have they approached HPC yet-they did this week.
- Angers asked about the retaining wall how they plan to strengthen it-engineers are researching it now, there are legalities as to who owns it which is also being researched.
- Angers will the design be somewhat like it is now-yes
- Angers-onsite parking-they own some on-site parking and have an agreement with Premium Parking to lease parking.
- Angers how many spaces are left in the parking garage? Galbraith will look into it.
- Deschambault-she thinks there will be enough parking in the garage but it pushes out neighbors who use it during snow storms.
- Beaudette this is fitting into the long term plan
- Dubois thinks this is a great use for this building, for the 3 IZ units what is the anticipation? Not sure at this time.
- Patoine-how long do they have to lease these parking spaces for, Galbraith in perpetuity.
- Patoine if the garage changes hands the lease remains.

10.c 2024.29 Review a Preliminary request for Site Plan/Subdivision for Westbrook Development Corporation (Thatcher Brook Affordable Housing). The property is 37 Barra Road (Tax Map 2, P/O Lot 42) in the I3 Zone.

- Galbraith introduced the project.
- Galbraith went over staff comments
- Tyler Norod, Kaleb Bourassa from Gorrill Palmer, Jesse Thompson from Kaplan Thompson represented the applicant presentation
- Public Comments:
Peter Robbins
- Patoine-can the porches be screened in-the applicants opted out due to how beat up the screens would get

- Deschambault-she likes the porch wanted to make sure there are measures to keep quiet for those who live on the first floor backing up to the porch.
- Angers-EV hook ups-this will be both solar & EV ready
- Angers asked about the positioning of the play space & garden
- Angers asked about handicapped parking, why they are only on one side. It is to get them closest to the front doors (main access).
- Norod mentioned the project is ADA compliant.
- Angers asked how many parking spots for residents and for visitors? Answer-36 for senior (25% vacant most likely), families 1:1 ratio, they are on the bus line. 15-20 spaces for guests.
- Angers will there be a bus stop out front? Answer-they have not had the conversation yet but will be making that request.
- Angers asked Planner are you dealing with MDOT about the traffic in this area. Answer-yes, it is being looked at by the internal traffic engineer now as we know it is definitely warranted.
- Dubois asked about the heat pumps will there be a condensing unit outside. Answer-Direct vent out, or VRF system, pad on the ground with a condenser that will have a cedar fence out-front. This is a bit premature as this is looked at during construction.
- Dubois concerned about pedestrian access on route 111 corridor, perhaps a bus shelter. Only 1 sidewalk on Rt. 111 and it ends at Fitness Center there is not even a shoulder. It is a great project.
- Beaudette traffic counts, is everyone coming through Barra Road to access Route 111, everyone comes through Route 111, and therefore traffic counts need to be updated.
- Patoine-waiting in a backup line is going to be the norm.
- Patoine-snow removal? This will be a storage for snow unless it is a huge storm then it will be removed.
- Patoine we need to institute an ability to serve from the electric companies. Applicant has been told there is an ability to serve from CMP.

MOTIONS:

Motion-Deschambault-Motion to APPROVE Case # 2024.29 Preliminary Site Plan and Subdivision Review for Westbrook Development Corporation (WDC) for the proposed construction of 80±-affordable housing at 37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone and forward a positive recommendation to the City Council to approve Contract Zone #24.

Second-Angers

Vote-Motion passed unanimously

10.d 2024.31 Review a Preliminary Site Plan for Mike Eon Associates, LTD. The property is 25 Barra Road (Tax Map 2, Lot 43-10) in the I3 Zone. The applicant plans on constructing a Dentist's Office with 25 Parking Spaces.

- Iriqat introduced this project. He mentioned this is the second time this has come through, this has had multiple extensions but eventually expired. Applicant is obligated to pay CFUP.

- Chris MacDonald from BH2M is representing the applicant as well as Mike Eon from Mike Eon Associates, LTD.
- Previous PB approval January of 2016 as office space and restaurant. Project changed to a dentist's office.
- 4800 SF building with 25 parking spots for 5 dentists
- Building is in the Thacher Brook Watershed, stormwater treatment more strenuous due to the condition of Thacher Brook.
- Mr. Eon gave a history of the project.
- He is working with a dentist who is interested in opening her practice in this structure.
- He talked about the timeline on this project.
- He talked about the steps he has taken to get this done.
- No comments from the public
- Patoine-it is a cut and dry application
- Deschambault feels they need something like a restaurant there but is happy with the dentist office.
- Patoine thanked him for filling the need of another business owner.
- Angers would motion (or ask Susan) to motion to go straight to final.
- Galbraith-we don't have a green light from engineering tonight so we have to stay at Preliminary

MOTIONS:

Motion-Deschambault-Motion to approve Case # 2024.31 Preliminary Plan Review for Mike Eon Associates LTD to construct a dentist office located at 25 Barra Road (Tax Map 2, Lot 43-10), with the recommended Conditions of Approval

Second-Angers

Vote-Motion passed unanimously

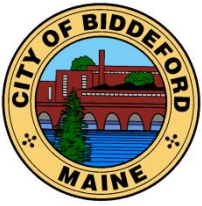
11. Other Business-Galbraith there are 2 plans to sign and plans for Board members to pick up.

12. Adjourn 8:08 PM

Planning Board Chair/Vice Chair

Date

These minutes are summary and are not intended to be verbatim. Archived meetings are viewable on the City's website: www.biddefordmaine.org.



CITY OF BIDDEFORD

Planning and Development Department

205 Main Street
P.O. Box 586
Biddeford, ME 04005
(207) 284-9115

Special Planning Board Meeting Meeting Minutes

DRAFT

Date: July 24, 2024
Time: 5:00 PM
Location: Council Chambers & Zoom

1. Pledge of Allegiance
2. Declaration of Quorum/Voting Members: Larry Patoine (Chair), Susan Deschambault, Roch Angers, Alexa Plotkin, Steve Beaudette & Matt Dubois (Alternate Member)
Staff Present: David Galbraith & Nan Whitten
Guest: City Attorney Harry Center
Chair Patoine opened the meeting at 5:00 PM reminding the public that this meeting is Not open for public comment
3. Adjustments to the Agenda- None
4. Planner's Business-There will be 2 Ordinance amendments coming to Planning Board soon.
5. New Business
2021.08 Planning Board action pursuant to Order of the York County Superior Court AP-23-007 and AP-23-014, McCready, et al. v. E & Development, et al. This is not a rehearing of the project, it is a clarification of the City's action for the Judge in this case. There will be no public comments for this item.
 - Galbraith introduced the City Attorney, Harry Center.
 - Attorney Center updated the Board about the above mentioned lawsuit.
 - Attorney Center had to get a signed written decision to E & R Development within a specific timeframe.
 - He talked about the errors in the Findings of Fact due to staff turnover
 - He asked if the Board had any questions regarding the affidavits signed by Nan Whitten and or David Galbraith
 - Dubois asked that the specific changes be pointed out, they were by Galbraith.
 - Patoine misspoke the name of E & R Developers in his reading of the new business so he clarified the name for the record.
 - Angers asked if there is video to back up the verbiage-yes
 - Attorney Center asked the Board members (who were there when this project was voted on) if they have an accurate recall of the events. All 3 answered yes.

MOTIONS:
Deschambault-Motion-To approve the Findings of Fact as presented.
Angers-Second
Motion Passed Unanimously
6. Other Business

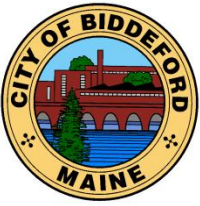
7. Adjourn 5:12 PM

Planning Board Chair/Vice Chair

Date

These minutes are summary and are not intended to be verbatim. Archived meetings are viewable on the City's website: www.biddefordmaine.org.

DRAFT



CITY OF BIDDEFORD

Planning and Development Department

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Planning Board – Staff Report

TO: Chair Patoine and Members of the Biddeford Planning Board

FROM: David C.M. Galbraith, Deputy Director / City Planner

DATE: July 31, 2024

RE: **Zoning Ordinance Text Amendment: Code of Ordinances, Part III: Land Development Regulations, “Table A - Table of Land Uses” to allow multi-family developments within the I-3 zoning district.**

MEETING DATE: August 7, 2024

Overview:

As the Board is aware, City staff has been working on a couple of multi-family housing developments along Barra Road. Although both projects are seeking Contract Zones for their developments, Staff believes that these types of developments should be allowed within the I-3 zoning district, with conditions. Staff is recommending the adoption of the attached Zoning Amendment to the City’s Code of Ordinances, Part III: Land Development Regulations, Table A – Table of Land Uses to allow multi-family housing developments within the City’s I-3 Zoning District, with conditions. The proposed text is highlighted in [blue underline](#). There is no text deletions proposed. The proposed text amendment is attached and the proposed conditions wording is shown below:

- A. Multifamily Dwellings: Proposed as a Permitted Use identified in Table A as “P”.
- B. Proposed Conditions shown below:

28. Multi-family dwellings are a permitted use within the I-3 zoning District providing:

- a) The housing development contains over 25-Units.
- b) The allowed housing density shall be 1,500 square feet per unit, divided by the lot acreage.
- c) The project is reviewed and approved by the Planning Board for Site Plan Review.

SAMPLE MOTIONS:

- A. Motion to Approve: I motion to APPROVE the proposed Zoning Ordinance Text Amendment: Code of Ordinances, Part III: Table A - Table of Land uses, as written.
- B. Motion to Deny I motion to DENY the proposed Zoning Ordinance Text Amendment: Code of Ordinances, Part III: Land Development Regulations, Part III: Table A - Table of Land uses, for the following reasons:

1) _____.

Zoning Ordinance Amendment: Code of Ordinances, Part III: Land Development Regulations, “Table A - Table of Land Uses” to allow multi-family developments within the I-3 zoning district.

Planning Board Meeting: August 7, 2024.

2) _____.

3) _____.

C. Motion to Table: I motion to TABLE the proposed the proposed Zoning Ordinance Text Amendment: Code of Ordinances, Part III: Land Development Regulations, Part III: Table A - Table of Land Uses, for the following reasons:

1) _____.

2) _____.

3) _____.

Planning Board Review
Ordinance Amendment to “Table A – Table of Land Uses” to Include Multi-family developments within the I-3 Zoning District
Date: August 7, 2024

V Attachment 1 City of Biddeford Table A
Table of Land Uses

[Amended 2-2-2010 by Ord. No. 2009.98; 8-3-2010 by Ord. No. 2010.70; 9-21-2010 by Ord. No. 2010.93; 6-21-2011 by Ord. No. 2011.36;
6-21-2011 by Ord. No. 2011.37; 4-3-2012 by Ord. No. 2012.24; 4-16-2013 by Ord. No. 2013.24; 3-18-2014 by Ord. No. 2014.16; 9-6-2016 by Ord. No. 2016.74; 1-17-2017 by Ord. No. 2016.87; 6-20-2017 by Ord. No. 2017.57; 1-16-2018 by Ord. No. 2018.3; 1-16-2018 by Ord. No. 2018.5; 6-5-2018 by Ord. No. 2018.44; 10-2-2018 by Ord. No. 2018.110; 3-5-2019 by Ord. No. 2019.15; 3-5-2019 by Ord. No. 2019.16]

KEY:
* Subject to Article VI, Performance Standards, of this ordinance. P Permitted use.
Not permitted.
C Conditional use. See Article VII for specific standards. A Accessory use.

	Article VI Section*	SR-1	CR	R-1-A	R-1-B	R-2	R-3	B-1	B-2	I-1	I-2	I-3	W-1	W-2	W-3	R-F	LR-F	M	IN20	OR	MSRD- 1 ^{2,b}	MSRD-2	MSRD-3
Residential uses:																							
Accessory dwelling units* 27	78	P	P	P	P	P	P						P		P	P				P		P	
Accessory structure*	2	P3	P3	P3	P3	P3	P3	P	P	P	P	P	P	P	P	P			P	P	P	P	P
Boarding, rooming house*	10					C	C															C	C
Bed-and-breakfast*	9		C			C							C			C				C	P	C	P
Cluster development*	18	C	C	C	C	C	C									C17						C	
Congregate housing*	19					C	C									C				C	P	C	P
Duplex/2-family	24	C				P	P								P	C				P		P	
Home occupation*	38	C	C	C	C	C	C	C						C	C	C				C	C	C	C
Manufactured housing*	See Article VI, Section 45.																						
Mobile home park*	See Article VI, Section 45.																						
Multifamily dwelling*	47					P	P	P				P*28		P1	P					C	P	P	P
Planned unit development*	73					C	C													C	C	C	C
Single-family dwelling 11	2	P	P	P	P	P	P						P		P	P				P		P	

- NOTES: a This column has been provided to serve as an aid in finding specific performance standards, but does not address all standards that may apply. Please consult Article VI for subsequent standards that may apply to a particular project.
- All uses cited above are subject to specific lot and setback, height, and performance requirements, as well as specific notes below:
- Multifamily use shall not exceed 10 units per structure, except in conformance with Table A Notes #28.
 - Requires Planning Board approval.
 - Accessory structures shall be limited to:
 - Private detached garages for the storage of no more than three automobiles.
 - Private greenhouses less than 200 square feet in floor area.
 - Private swimming pools.
 - Storage sheds, provided that they are uninhabitable and less than 200 square feet in area.
 - Decks, porches, patios, gazebos, summerhouses, and other structures intended for outdoor use, provided they are uninhabitable.
 - No closer than 1,000 feet to another similar facility.
 - (Reserved)
 - (Reserved)
 - Drive-through establishments (except as provided in Note 8) and street level residential uses are prohibited in the MSRD-1 Commercial Core District in the following areas:
 - Along both sides of Main Street between the intersection of Elm Street (Route 1) and Main Street through to the Saco City Line north of Water Street;

Planning Board Review

Ordinance Amendment to “Table A – Table of Land Uses” to Include Multi-family developments within the I-3 Zoning District

Date: August 7, 2024

- (b) On both sides of Adams Street from Main Street to Jefferson Street;
- (c) On the north side of Jefferson Street from Main Street to Alfred Street;
- (d) On both sides of Washington Street from Main Street to Jefferson Street;
- (e) On both sides of Federal Street between Washington Street and Franklin Street;
- (f) On both sides of Franklin Street; and (g) On both sides of Alfred Street from Jefferson Street/Pool Street to Main Street.

8. Financial institutions are permitted drive-throughs limited to two lanes, are a conditional review by the Planning Board, and must adhere to the following standards:

- (a) Located on the side or rear of the building and never between the building and the Main Street.
- (b) Access drive located to minimize impact on pedestrians:
 - Not between building and the street;
 - Entrance from a side street where possible;
 - Sidewalk material carried across any driveways.
- (c) Adequate queuing land preferably separate from the parking lot.
- (d) Architectural treatment compatible with main building.
- (e) Controlled lighting that does not glare onto neighboring property.

9. Review by the Board of Appeals required for all truck loading facilities for new buildings and for changes in tenancy.

10. Limited to offices for medical professionals and associated fields.

11. Unless otherwise stated or allowed within the provisions of this ordinance, no more than one dwelling unit shall be allowed per lot.

12. (Reserved)

13. Shall be considered as a home occupation; only products grown on the premises may be sold, unless the stand is recognized as a commercial operation.

14. Transportation facilities here shall be limited to facilities associated with firms or businesses serving passenger transport, such as bus terminals, taxi stations, passenger rail stations, etc.

15. (Reserved)

16. Shall be limited to internal storage in existing buildings that require no external structural changes. No loading bays shall be constructed. Off-street parking shall be available with no fewer than one space per 20 storage units. A copy of the contract that will be offered to prospective tenants shall be submitted for review.

17. Adult businesses are restricted to that portion of the B-2 District between Dartmouth Street and Landry Street. No adult business shall be located on any lot or parcel of land with road frontage on Elm Street.

18. All subdivisions in the Rural Farm Zoning District shall be clustered, and developed in accordance with Article VI, Section 16, Cluster Developments, of this ordinance.

19. This use does not include facilities, activities, or programs conducted by or hosted by a college or university that meet the definition of “university uses.” Such uses shall be considered as university uses and shall be permitted in the institutional zone subject to the requirements of the zone and the additional performance standards for colleges/universities.

20. Within that portion of the Institutional (IN) Zone subject to a Shoreland Zoning District, existing buildings, structures, and roads may be maintained, modified, or replaced but no new buildings shall be built or located and no existing buildings shall be enlarged (including the replacement of existing buildings) except as follows: The existing buildings and roads may be modified to the extent necessary to meet the requirements of applicable local, state, or federal codes or regulations, the existing sewage treatment plant may be expanded or replaced, and the existing Marine Science Center may be expanded through the construction of one additional building, provided that such changes meet all shoreland requirements and the performance standards of Article XIV.

21. See Article V, Section 7, Main Street Revitalization Districts for land uses.

22. All addiction treatment facilities shall meet all applicable federal, state, and local laws and regulations. No occupancy permits shall be issued until evidence of state certification has been presented to the Code Enforcement Office.

23. (Reserved)

24. (Reserved)

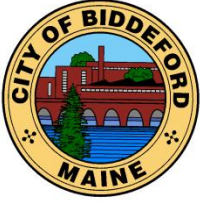
25. Internal storage fully enclosed within buildings only. Loading bays shall be located on the side or rear of buildings and shall be screened from view from public streets and any abutting residential uses.

26. Self- storage facilities in the B-2 Zone shall not be permitted northeast of the Route 1/Dartmouth Street intersection.

27. Accessory dwelling units may also be permitted in nonresidential zones where there exists a nonconforming (as to use) single-family dwelling on a lot that was in existence as of January 1, 2017. See Article VI, Section 78.

28. Multi-family dwellings are a permitted use within the I-3 zoning District providing:

- a) The housing development contains over 25-Units**
- b) The allowed housing density shall be 1,500 square feet per unit, divided by the lot acreage.**
- c) The project is reviewed and approved by the Planning Board for Site Plan Review**



CITY OF BIDDEFORD

Planning and Development Department

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Assistant City Planner
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(207)-284-9115
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PLANNING BOARD STAFF REPORT

TO: Chair Patoine and Members of the Biddeford Planning Board

FROM: Adi Iriqat, Assistant City Planner

DATE: July 30, 2024

RE: **2024.40 Shoreland Zoning Permit for 42 Mile Stretch Road (Tax Map 62, Lot 7) in the Coastal Residential (CR) Zone / Greatest Practical Extent Determination.**

MEETING DATE: August 7, 2024 at 6:00 PM

1. INTRODUCTION

The project site is located within the Resource Protection overlay (RP) of the Shoreland Zone and the Coastal Residential (CR) base zone. The site is bordered by Biddeford Pool to the Northwest, and the Atlantic Ocean to the Southeast, on the opposite side of Mile Stretch Road. For the case of this Shoreland Zoning Greatest Practical Extent determination, Biddeford Pool is the protected resource.



42 Mile Stretch Road (Tax Map 62, Lot 7) - Greatest Practical Extent Determination

Case # 2024.40 Shoreland Zoning Permit for 42 Mile Stretch Road (Tax Map 62, Lot 7) in the CR Zoning District / Greatest Practical Extent Determination.

Planning Board Hearing: August 7, 2024

The Property at 42 Mile Stretch Road was built in 1950 and the severe storms of this past January have left the property unsafe to use. The storm on Jan 13th inflicted the most damage to the structure, the block foundation on the ocean side completely blown out while filling basement/garage with sand and blowing out the garage doors on the street side. The only feasible solution to fixing this damage is with an open pier design that would allow for the migration of sand and water under the structure. This design would be able to survive strong coastal storms while meeting the requirements of the new flood maps which were adopted by Biddeford in July of 2024.

The home is partially located in a VE zone which would require the underside (first finished floor) of structure to be elevated 39 inches from where it is currently. This change in height would still be well under the allowed maximum height.



Ocean Side Elevation - Southwest

The process would require the applicant to lift the house and temporarily slide the structure to the side while excavation and concrete pier work are performed. The house would be placed back in its current location with the assistance of Lower Village Survey. The house would have to remain in its current location due to the fact it is non-conforming and is bordered by the ocean, street, septic and lot line. As you can see from the size and location of the property, the legally existing non-conforming home is located within the front, rear and one of the side setbacks, therefore constructing new supporting piers under the existing structure is the best and most efficient way to accommodate the need to elevate the structure.

Case # 2024.40 Shoreland Zoning Permit for 42 Mile Stretch Road (Tax Map 62, Lot 7) in the CR Zoning District / Greatest Practical Extent Determination.

Planning Board Hearing: August 7, 2024

2. PROJECT DATA/INFORMATION

1.	Applicant:	Michael Richard 5 Burnie Way Biddeford Biddeford, ME 04005
2.	Owner of Property:	Michael Bilodeau 42 Mile Stretch Road Biddeford, ME 04005
3.	Agent:	Same as applicant
4.	Engineer:	Lower Village Survey 13 Western Avenue Kennebunk, ME 04043
5.	Project Location:	42 Mile Stretch Road
6.	Project Tax Map #/Lot #:	Tax Map 62, Lot 7
7.	Lot Size:	0.15
8.	Base Zoning:	Coastal Residential (CR)
9.	Overlay Zoning:	Limited Residential & Resource Protection
10.	Existing Use:	Private Residential
11.	Proposed Use:	Reparation and future flood preparedness
12.	Approvals Required:	Greatest Practical Extent
13.	Uses in the Vicinity:	Residential
14.	Number of Lots/Units in Subdivision:	N/A
15.	Minimum Lot Size Required: Provided:	30,000 Square Feet 10,000+ Square Feet
16.	Frontage Required: Provided:	150' 100'
17.	Front Setback Required: Provided:	40' >40'
18.	Side Setbacks Required: Provided:	25' >25'
19.	Rear Setback Required: Provided:	25' >25'
20.	Height Requirements: Provided:	35 feet or 3 stories 25 feet
21.	Water Supply:	Public Water
22.	Sewage Disposal:	Private Septic
23.	Solid Waste Disposal:	Public Trash
24.	Fire Protection:	City of Biddeford
25.	Floodplain Status:	Located in the Flood Zone AO
26.	Wetland/Surface Water Impacts:	N/A
27.	Soil Study Provided:	N/A
28.	Parking Spaces Required:	N/A
29.	Parking Spaces Provided (total):	N/A

Case # 2024.40 Shoreland Zoning Permit for 42 Mile Stretch Road (Tax Map 62, Lot 7) in the CR Zoning District / Greatest Practical Extent Determination.

Planning Board Hearing: August 7, 2024

	# Handicapped Spaces:	
30.	Ownership of Road:	Mile Stretch Street is a Public Road
31.	Impervious Surface Area:	0 SF Change
32.	Total Disturbed Area:	0 SF of Previously Undisturbed Area
33.	Waivers Needed:	N/A
34.	Waivers Granted:	N/A
35.	Variances Needed for Approval:	None
36.	Other Permits Obtained:	N/A
37.	Other Non-City Permits Required:	None
38.	Fees Paid:	Yes
39.	Planning Board Review History:	August 7, 2024-Greatest Practical Extent

3. EXISTING CONDITIONS

The existing building is a one-story residential structure.

4. PROJECT PROPOSAL

The applicant is requesting the permission to lift existing house, approximately 40 inches, at 42 Mile Stretch Road to replace foundation with concrete piers in the exact location.

5. NEXT STEPS/SUGGESTED ACTIONS

If the applicant has addressed the outstanding items to the satisfaction of the Planning Board, and Planning Board approves the project, Staff recommend doing so with the following Conditions of Approval:

- 1. The raised building shall not be relocated closer to any of the existing property lines as noted on the approved plan.**
- 2. The Code Enforcement Officer shall review and approve conformance to Section 15 of the Shoreland Zoning Ordinance.**
- 3. Obtain all required permits from Maine Department of Environmental Protection and the Biddeford Code Enforcement Office.**
- 4. This approval shall expire one year from the date below if a substantial start is not made in construction. If a substantial start is made within one year of the date below, the applicant shall have one additional year to complete the project, thereafter this approval shall expire.**

6. SAMPLE MOTIONS

- A. Motion to approve Case # 2024.40 Shoreland Zoning / Greatest Practical Extent Determination for 42 Mile Stretch Road (Tax Map 62, Lot 7) in the CR Zoning District Determination, with the above listed Conditions of Approval.**

Case # 2024.40 Shoreland Zoning Permit for 42 Mile Stretch Road (Tax Map 62, Lot 7) in the CR Zoning District / Greatest Practical Extent Determination.

Planning Board Hearing: August 7, 2024

B. Motion to Table Case # 2024.40 Shoreland Zoning / Greatest Practical Extent Determination for 42 Mile Stretch Road (Tax Map 62, Lot 7) in the CR Zoning District Determination, based upon the following reasons:

a) _____

b) _____

c) _____

C. Motion to Deny Case # 2024.40 Shoreland Zoning / Greatest Practical Extent Determination for 42 Mile Stretch Road (Tax Map 62, Lot 7) in the CR Zoning District Determination, based upon the following reasons:

a) _____

b) _____

c) _____



City of Biddeford – Planning Department

Planning Board Application

P.O. Box 586, 205 Main Street Biddeford, Maine 04005
207-284-9115

Revised: May 17, 2022

Type of Application:

☒ Shoreland Zoning Permit ☐ Site Plan Review ☐ Extraction
☐ Conditional Use Permit ☐ Subdivision ☐ Private Way
☒ Other: GPE

Applicant Information:

Name: Michael Richard
Mailing Address: 5 Bernie Way Biddeford, ME 04005
Telephone: 207 232-2236
Email: spurwinkconstruction212@gmail.com
What is your legal interest in the property?
☐ Owner ☐ Potential Buyer with Contract ☐ Lease/Rental Agreement ☒ Contractor

Owner's Information:

Name: Michel Bilodeau
Mailing Address: 42 Mile Stretch Rd
Telephone: 514 825-0803
Email: michbilodeau@me.com

Agent's Information:

Name: _____
Mailing Address: _____
Telephone: _____
Email: _____

Engineer/Surveyor's Information:

Name: Lower Village Survey
Mailing Address: 13 Western Ave. Kennebunk, ME 04043
Telephone: 207 967-3545
Email: deb@lowervillagesurveyco.com

Project Location and Lot Information:

Street Address: 42 Mile Stretch Rd. Drainage Watershed: _____
Tax Map: _____ Lot: _____
Current Zoning: _____ Shoreland Zoning: _____
Size of Lot: _____ () acres () s.f. Lot Frontage: _____
Existing Use of Property: private residence

Property currently serviced by:

☒ City Road ☐ Public Sewer ☒ Public Water ☒ Public Trash
☐ Private Road ☒ Septic System ☐ Private Well ☐ Private Hauler

Slope Conditions in Area of Construction (if applicable):

☒ Flat (0-3% slope) ☐ Rolling (3-8% slope) ☐ Hilly (8-15% slope) ☐ Steep (15%+ Slope)

Are there any wetlands or waterbodies on the site? ☒ (Yes) ☐ (No) if yes attach information

Is the project within the 100-year floodplain? ☒ (Yes) ☐ (No) if yes attach information

Do you plan to bring fill onto the lot? ☒ (Yes) ☐ (No) If yes attach information

Description of proposed use of property:

Project/Proposed Use:

Repair Private residence and prepare for future storms

Property to be Serviced by:

☒ City Road ☐ Public Sewer ☒ Public Water ☒ Public Trash
☐ Private Road ☒ Septic System ☐ Private Well ☐ Private Hauler

Limits of Disturbance: _____ () acres () s.f.

Net change in impervious cover: None () acres () s.f.

Is this project part of a larger project? ☐ (Yes) ☒ (No)

Is the project proposing a new Private or Public Road? ☐ (Yes, Private) ☐ (Yes, Public) ☒ (No)

Is this project within the Urbanized Area/MS4 (see City Drainage Map) ☐ (Yes) ☒ (No)

Is the project proposing any Stormwater facilities/BMPs? ☐ (Yes) ☒ (No)

Will a Traffic Movement Permit (TMP) be required?: ☐ (Yes) ☒ (No)

If in a Shoreland Zone:

Percent of residential lot coverage (Max 20%): Included in Survey

Percent of structure expansion (Max 30%): 0

If Subdivision Review, number of lots proposed: _____

If a Private Way is proposed, number of lots served: _____

If Site Plan Review, you must provide the following information:

Total new square feet footprint of structure: _____

Total new square feet paving/parking: _____

Waiver Requests (attach details):

1. _____
2. _____
3. _____
4. _____
5. _____

Required Submittal Attachments:

- A. Letters of Approval
 - ☐ Fire Department – Contact Chief or Deputy Chief – 282-9986
 - ☐ Ability to Serve for Water Service – Maine Water – 282-1543
 - ☐ Ability to Serve for Sewer Service – Engineering Department – Tom Milligan 284-9118
 - ☐ Police Department – e-911 Road Name Designation – Contact Joanne Fisk 282-5127
- B. Letter to Planning Board describing project, Waiver requests, proposed improvements, addressing permit requirements, etc.
- C. Photographs of Site.
- D. Architectural renderings/drawings of proposed buildings, as required.
- E. Engineering Plans, as required.
- F. Stormwater Management Report, as required.

Fees (Due at time of Submission):

- \$75 Nonrefundable Administration Fee is required for every application.
- Refer to "Attachment A Fees and Charges" of the Land Development Regulations for more information. Consult with Planning Staff if you have questions.

Required Signatures:

By signing this application, as the foresaid applicant or authorized agent:

- I certify that I have read and completely understand the application;
- I certify that the information contained in this application and its attachments are true and correct;
- I understand that all information provided on this form and all other documents submitted as part of my proposal is a matter of public record;
- I understand that copies of this information may be supplied upon request to an interested party.
- I understand that additional funds may be required through the course of the review for special studies, legal review costs, and/or engineering review.
- I understand that by submitting an application I am not guaranteed a place on any particular agenda. I further understand that the City Planner will place me on an agenda for review when the application is deemed substantially complete.

Will the proposed project cause 1 acre or more of site disturbance?: (Yes) (No)

- If Yes, applicant is responsible for any required Maine Construction General Permits and shall comply with the requirements of DEP Chapter 500 Stormwater Regulations, as they apply.

Signature of Applicant: 

Date 7/1/2024

Signature of Property Owner: 

Date 7/1/2024

DIGITAL SUBMITTAL REQUIREMENTS FOR ALL SUBMITTALS:

- A) PDF OF SIGNED APPLICATION
- B) PDFs OF ALL DRAWING SETS AND OTHER REQUIRED SUBMITTAL ATTACHMENTS NOTED ABOVE

HARD-COPY SUBMITTAL REQUIREMENTS FOR PLANNING BOARD APPLICATIONS:

- A) SEVEN (7) FULL-SIZE PAPER COPIES OF DRAWING SETS

DIGITAL SUBMITTAL REQUIREMENTS FOR FINAL APPROVAL:

- A) INDIVIDUALLY NAMED PDFs OF EACH DRAWING (NOT A COMBINED PDF SET)
 - Individual Drawing PDF Naming Format: 'PROJECT/SHEETSET NAME_INDIVIDUAL DRAWING NAME.pdf'
- B) PDF COPIES OF ALL PERMIT APPROVALS, APPLICATIONS, REPORTS, NARRATIVES, LETTERS, ETC.
- C) FINAL CAD REFERENCE FILES IN DWG FORMAT (SURVEY & PROPOSED DESIGN LINWORK)
 - All drawings & CAD reference files must be to-scale and within the following coordinate systems:
 - MAINE STATE PLANE WEST NAD83 (Horizontal Datum) & NAVD88 (Vertical Datum)

HARD-COPY SUBMITTAL REQUIREMENTS FOR FINAL APPROVAL:

- A) THREE (3) FULL-SIZE PAPER COPIES OF INDIVIDUAL DRAWINGS REQUIRING BOARD SIGNATURE
- B) ONE (1) FULL-SIZE PAPER COPY OF ENTIRE DRAWING SET FOR ENGINEERING RECORDS

PLEASE CONFIRM WITH PLANNING STAFF FOR CLARIFICATION

David Galbraith

City Planner

City of Biddeford

205 Main Street

Biddeford, Maine 04005

July 1, 2024

Dear David,

Please find the attached application for permission to lift existing house at 42 Mile Stretch Road to replace foundation with concrete piers in the exact location. The submittal includes 9 copies of the following:

- Cover letter
- Site survey prepared by Lower Village Survey
- New design of piers prepared by Mike Bedell of KRA a licensed engineer
- Photos of existing conditions
- Planning Board application

The Property at 42 Mile Stretch Road was built in 1950 and the severe storms of this past January have left the property unsafe to use. The storm on Jan 13th inflicting the most damage, the block foundation on the ocean side completely blown out while filling basement/garage with sand and blowing out the garage doors on the street side. The only feasible solution to fixing this damage is with an open pier design that would allow for the migration of sand and water. This design would be able to survive strong coastal storms while meeting the requirements of the new flood maps being adopted by Biddeford in July of 2024. The home is partially located in a VE Elev. 18 zone which would require the underside of structure to be Elev. 19. This change in height would amount to an increase of 39 inches from where it is currently. This change in height would still be well under the allowed maximum height.

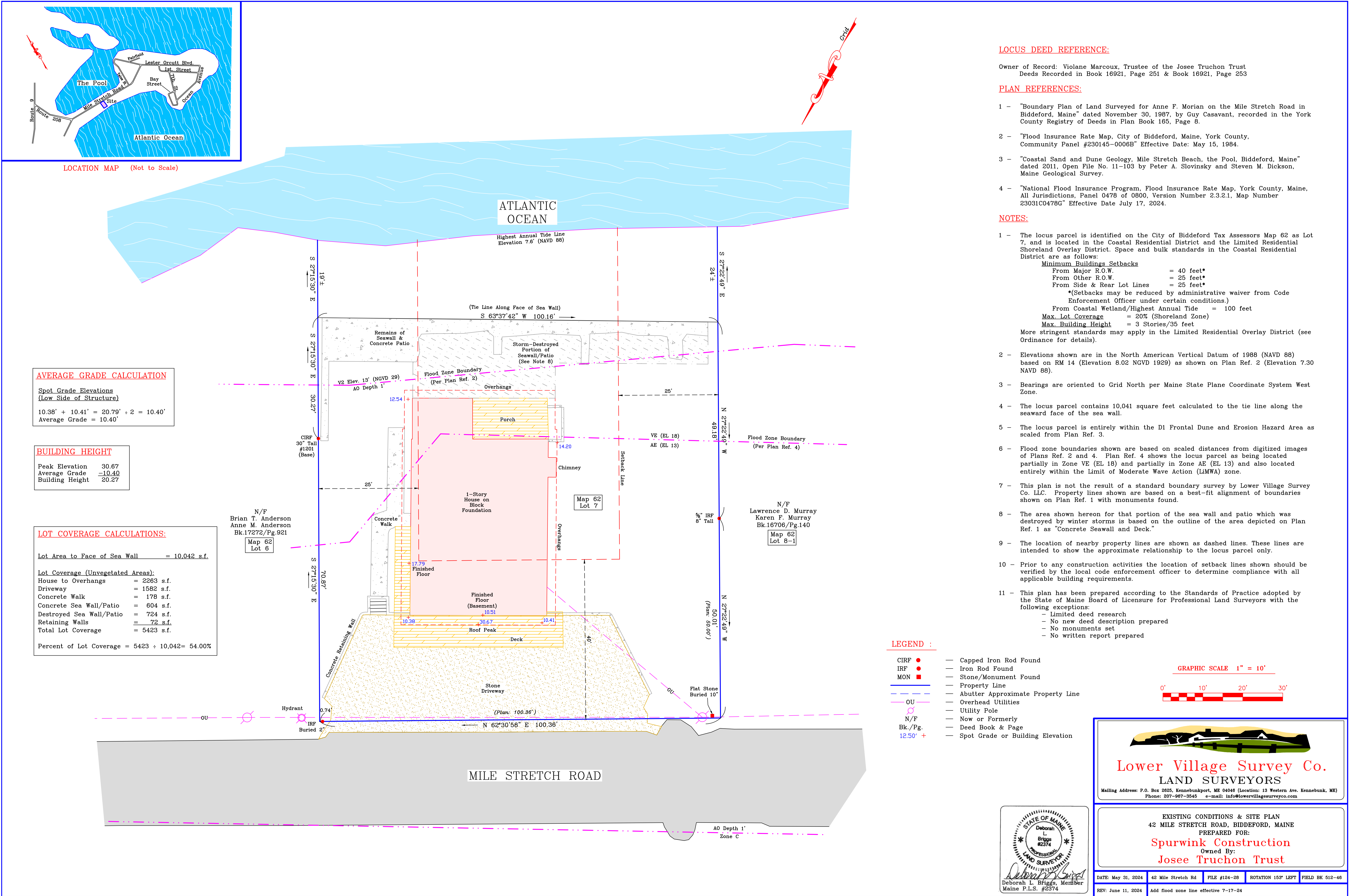
The process would require us to lift the house and slide the structure to the side while excavation and concrete work are performed. Then the house would be placed back in its current location with the assistance of Lower Village Survey. The house would have to remain in its current location due to the fact it is non-conforming and is bordered by the ocean, street, septic and lot line.

We appreciate your consideration in this matter.

Contractor

Michael Richard





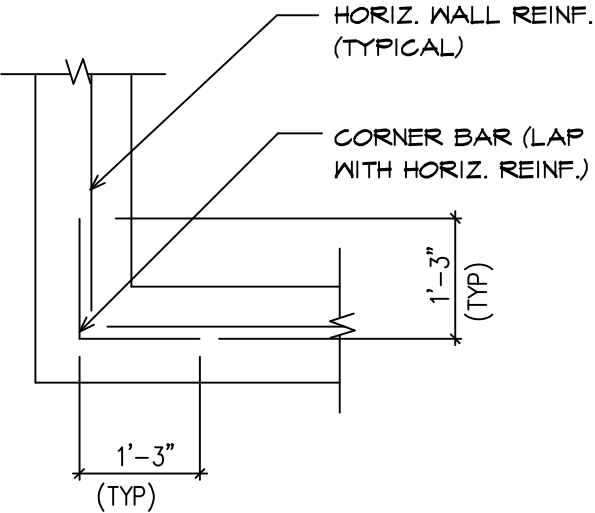
SEE COVER SHEET FOR GENERAL NOTES AND CODE SUMMARY

INFORMATION SHOWN ON THE COVER SHEET APPLIES TO ALL TRADES FOR THE WORK OF THIS PROJECT, AND INCLUDES TYPICAL NOTES AND SPECIFIC CODE REQUIREMENTS FOR THOSE TRADES.

CONTRACTOR SHALL MEASURE AND VERIFY ALL DIMENSIONS AT THE WORK.

THIS DRAWING IS A PART OF A FULL SET OF DRAWINGS COMPRISING THE CONTRACT DOCUMENTS FOR THE WORK OF THIS PROJECT. THE ARCHITECT/OWNER ACCEPTS NO RESPONSIBILITY FOR THE CONTRACTORS' ERRORS OR OMISSIONS IF EACH TRADE DOES NOT HAVE THE FULL SET OF THESE DRAWINGS AND SPECIFICATIONS.

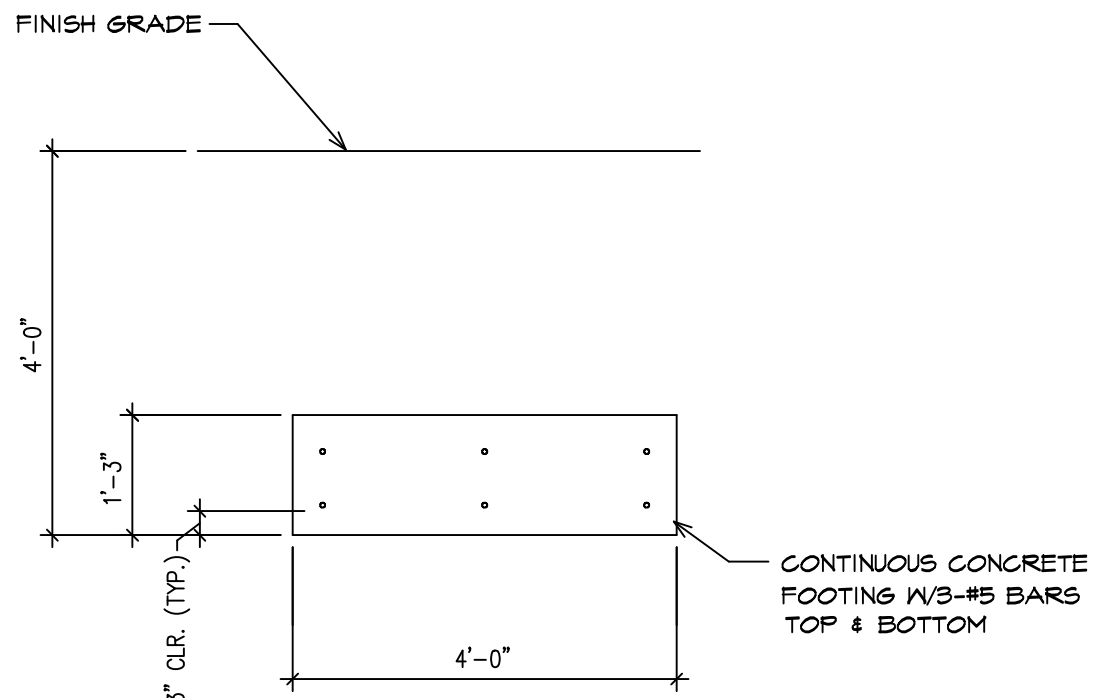
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NOTE:
1. FOOTING REINFORCING SIMILAR

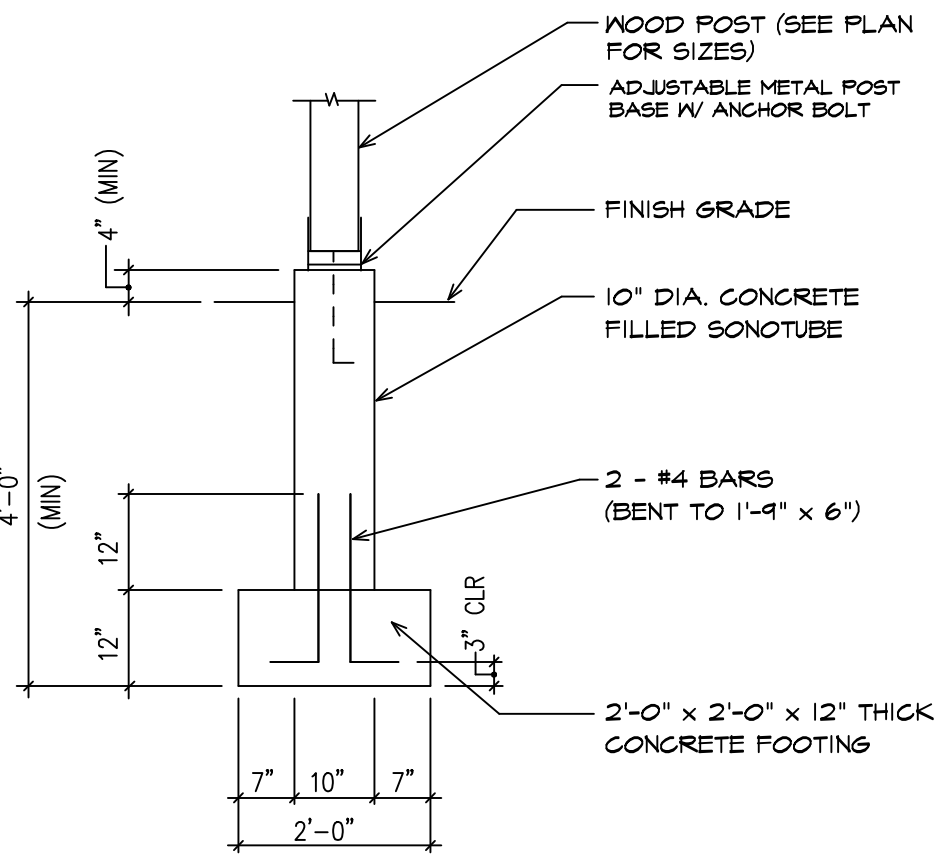
TYPICAL CORNER REINFORCING
N.T.S.

1



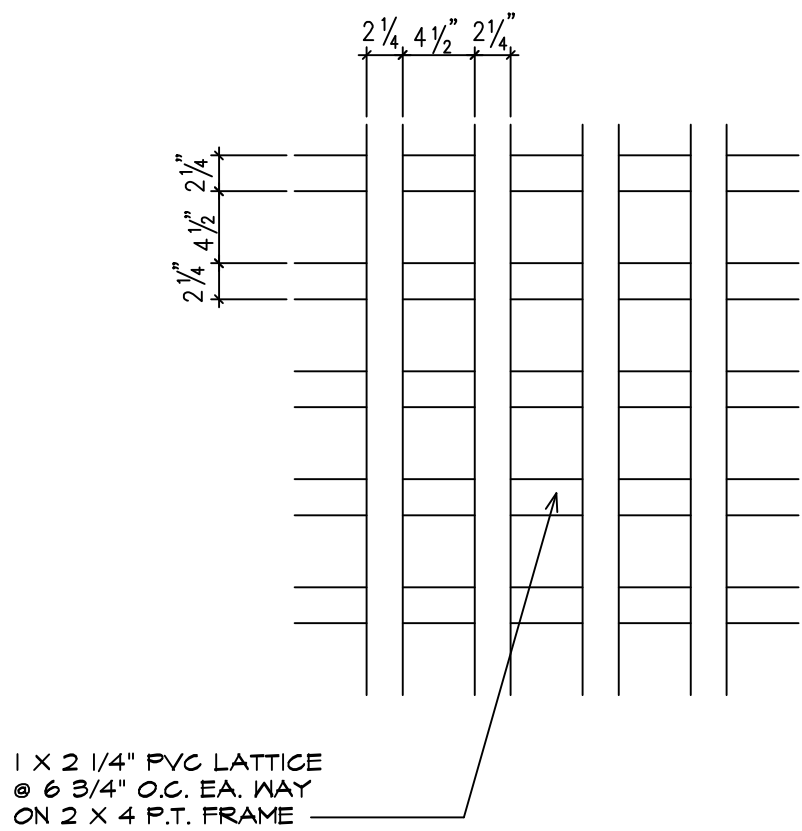
TYPICAL FOOTING
SCALE: 1/2" = 1'-0"

2



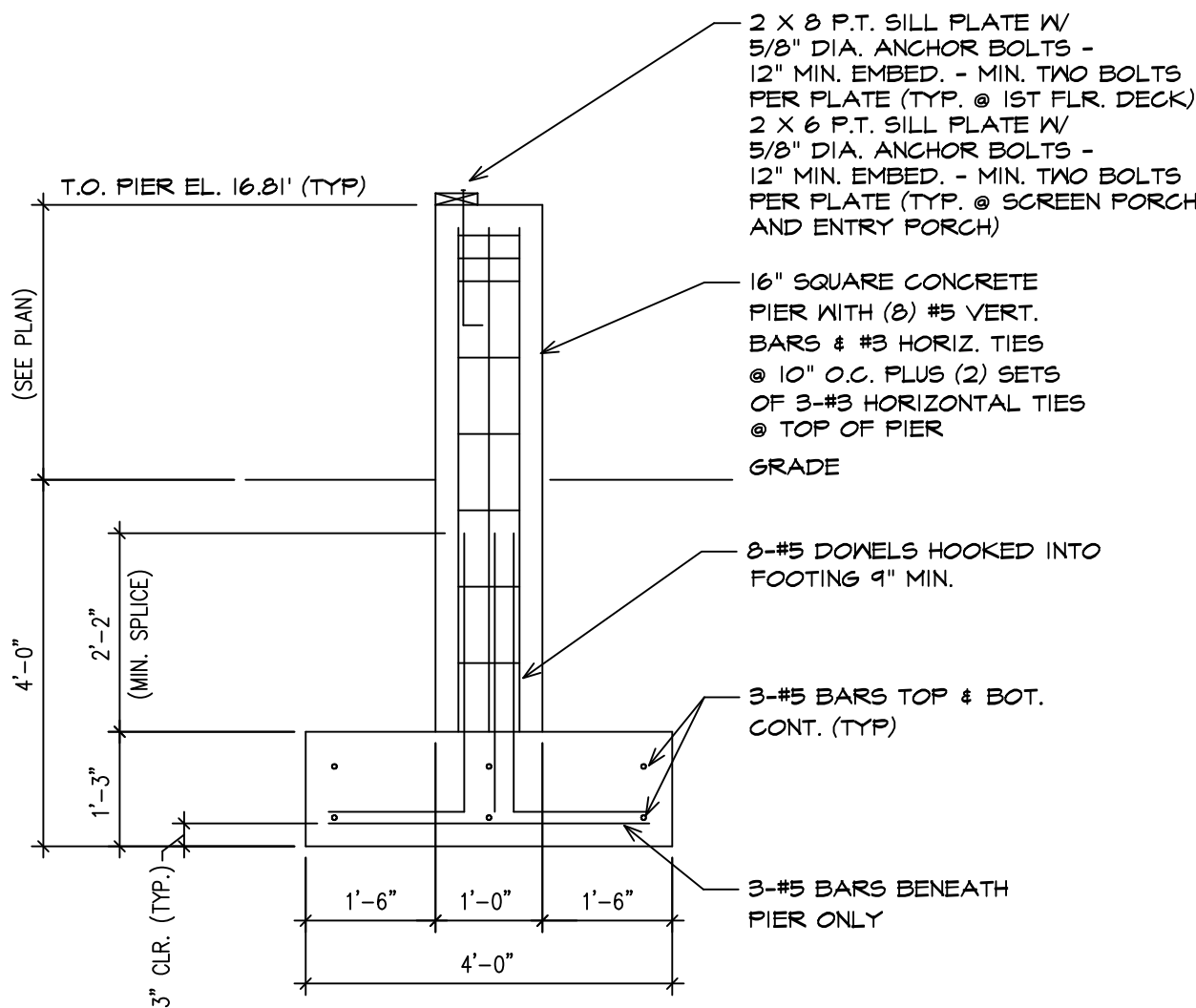
SONOTUBE/FOOTING DETAIL
SCALE: 1/2" = 1'-0"

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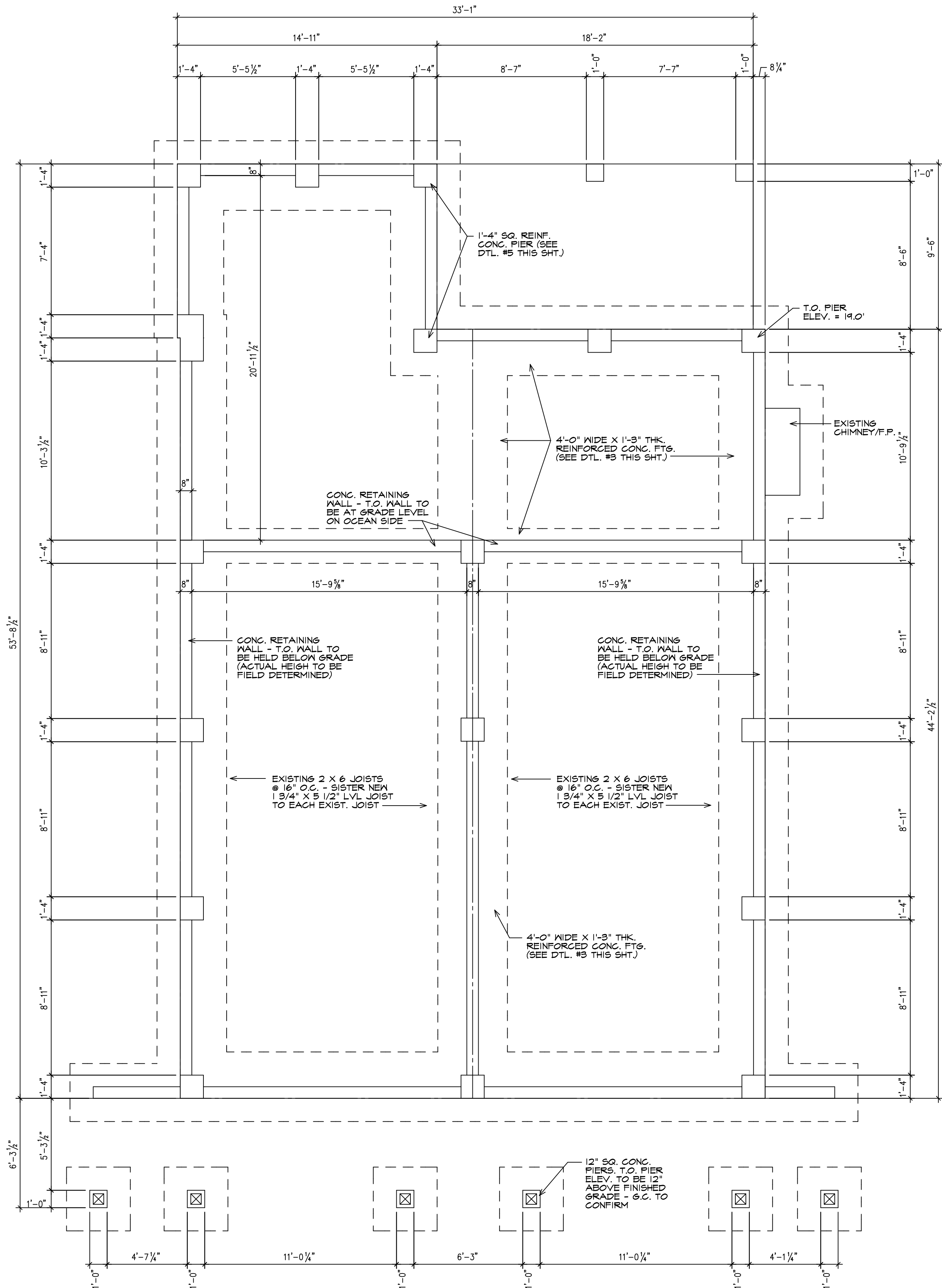
LATTICE DETAIL
SCALE: 1/2" = 1'-0"

5



TYPICAL PIER DETAIL
SCALE: 1/2" = 1'-0"

4



REVISIONS

KRA
KENNEBUNK
RIVER
ARCHITECTS

1662 Popl. Rd., Suite B6
Biddeford, ME 04005
207.216.9850

KENNEBUNKRIVERARCHITECTS.COM

DRAWN:

MRB

CHECKED:

DATE:

PROJECT NO.

Bildeau Residence

42 Mile Stretch Road
Biddeford, Maine

FOUNDATION PLAN

SCALE: 1/4" = 1'-0"

A-1



David Galbraith

City Planner

City of Biddeford

205 Main Street

Biddeford, Maine 04005

July 1, 2024

Dear David,

Please find the attached application for permission to lift existing house at 42 Mile Stretch Road to replace foundation with concrete piers in the exact location. The submittal includes 9 copies of the following:

- Cover letter
- Site survey prepared by Lower Village Survey
- New design of piers prepared by Mike Bedell of KRA a licensed engineer
- Photos of existing conditions
- Planning Board application

The Property at 42 Mile Stretch Road was built in 1950 and the severe storms of this past January have left the property unsafe to use. The storm on Jan 13th inflicting the most damage, the block foundation on the ocean side completely blown out while filling basement/garage with sand and blowing out the garage doors on the street side. The only feasible solution to fixing this damage is with an open pier design that would allow for the migration of sand and water. This design would be able to survive strong coastal storms while meeting the requirements of the new flood maps being adopted by Biddeford in July of 2024. The home is partially located in a VE Elev. 18 zone which would require the underside of structure to be Elev. 19. This change in height would amount to an increase of 39 inches from where it is currently. This change in height would still be well under the allowed maximum height.

The process would require us to lift the house and slide the structure to the side while excavation and concrete work are performed. Then the house would be placed back in its current location with the assistance of Lower Village Survey. The house would have to remain in its current location due to the fact it is non-conforming and is bordered by the ocean, street, septic and lot line.

We appreciate your consideration in this matter.

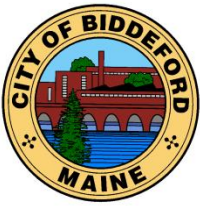
Contractor

Michael Richard









CITY OF BIDDEFORD

Planning and Development Department

Adi Iriqat
Assistant City Planner
205 Main Street
P.O. Box 586
Biddeford, ME 04005
(207)-284-9115
adi.iriqat@biddefordmaine.org

PLANNING BOARD STAFF REPORT

TO: Chair Patoine and Members of the Biddeford Planning Board

FROM: Adi Iriqat, Assistant City Planner

DATE: July 25, 2024

RE: **2024.35 Conditional Use Permit for Arc-En-Ciel Peaceful Place to Grow and Learn LLC at 25 Green Street (Tax Map 38, Lot 263) in the MSRD-2 Zone.**

MEETING DATE: August 7, 2024 at 6:00 PM

1. INTRODUCTION

Christine Biyoga seeks to apply for zoning approval for 25 Green Street in Biddeford to open Arc-En-Ciel Peaceful Place to Grow and Learn LLC, a small child care facility. Located in common space of a Biddeford Housing Authority building, the center will care for up to 12 children ages 6 weeks to 12 years old.



The property is approximately 0.27-acres in area and it is located in the City's MSRD-2 Zoning District. The MSRD-2 District classifies "home day cares" (up to 12 children) as a "Conditional Use" which requires Planning Board review and approval. Christine is working with full support of Guy Gagnon, BHA Executive Director, in addition to collaborating with the United Way of Southern Maine and CEI's Child Care Business Lab.

2024.35 Conditional Use Permit for Arc-En-Ciel Peaceful Place to Grow and Learn LLC at 25 Green Street (Tax Map 38, Lot 263) in the MSRD-2 Zone.

Planning Board Meeting Date: August 7, 2024 at 6:00 PM



Exterior of 25 Green St/ Map 38, Lot 263

The subject property is an existing six (6) unit residential property and the proposal seeks to convert one of the units into a home day care operation. In addition to the existing on-site parking Green Street allows on-site parking so parking is not a concern.

2. PROJECT DATA/INFORMATION

1.	Applicant:	Christine Biyoga 28 ½ Holly Street Portland, ME 04103
2.	Owner of Property:	Biddeford Housing Authority 22 South Street Biddeford, ME, 04005
3.	Agent:	Same as applicant
4.	Engineer:	N/A

2024.35 Conditional Use Permit for Arc-En-Ciel Peaceful Place to Grow and Learn LLC at 25 Green Street (Tax Map 38, Lot 263) in the MSRD-2 Zone.

Planning Board Meeting Date: August 7, 2024 at 6:00 PM

5.	Project Location:	25 Green Street
6.	Project Tax Map #/Lot #:	Tax Map 38, Lot 263
7.	Lot Size:	0.27
8.	Base Zoning:	MSRD-2
9.	Overlay Zoning:	N/A
10.	Existing Use:	Residential
11.	Proposed Use:	Addition of a facility-based child-care
12.	Approvals Required:	Conditional Use Permit
13.	Uses in the Vicinity:	Residential
14.	Number of Lots/Units in Subdivision:	N/A
15.	Minimum Lot Size Required: Provided:	2000 S.F per unit 10,000 S.F
16.	Frontage Required: Provided:	50' >76'
17.	Front Setback Required: Provided:	15' 6'
18.	Side Setbacks Required: Provided:	10' >27'
19.	Rear Setback Required: Provided:	10' >50'
20.	Height Requirements: Provided:	35 feet or 3 stories
21.	Water Supply:	Public Water
22.	Sewage Disposal:	City of Biddeford
23.	Solid Waste Disposal:	N/A
24.	Fire Protection:	City of Biddeford
25.	Floodplain Status:	Property is not within a NFIP Zone A or V flood zone
26.	Wetland/Surface Water Impacts:	None
27.	Soil Study Provided:	N/A
28.	Parking Spaces Required:	1 Space for every 4 Children Facility is Licensed to Care = 4 parking stalls
29.	Parking Spaces Provided (total): # Handicapped Spaces:	15 +/-
30.	Ownership of Road:	Green Street is a Public Road
31.	Impervious Surface Area:	0 SF Change
32.	Total Disturbed Area:	0 SF of Previously Undisturbed Area
32.	Estimated Site Development Costs:	N/A
33.	Financial Capacity Letter:	N/A
34.	Waivers Needed:	N/A
35.	Waivers Granted:	N/A
36.	Variances Needed for Approval:	None
37.	Other Permits Obtained:	N/A
38.	Other Non-City Permits Required:	None
39.	Covenants, By-laws, Restrictions	None

2024.35 Conditional Use Permit for Arc-En-Ciel Peaceful Place to Grow and Learn LLC at 25 Green Street (Tax Map 38, Lot 263) in the MSRD-2 Zone.

Planning Board Meeting Date: August 7, 2024 at 6:00 PM

	Required:	
40.	Fees Paid:	Yes
41.	Planning Board Review History:	August 7, 2024-Conditional Use Permit

3. EXISTING CONDITIONS

The existing building is a three-story, six (6) unit residential structure.

4. PROJECT PROPOSAL

Home Day-Care Facility

5. STAFF REVIEW

REVIEW STANDARDS: The project is subject to Conditional Use Standards Listed below:

Section 6 Standards:

- A. Applications for conditional use permits must meet the standards specified in Article VI of this ordinance as well as the standards of subdivision or site review. In addition, because of the unique nature and particular concern that the general public may have relating to a conditional use in a particular zone, the Planning Board shall consider each of the applications in light of the guidelines presented below.
- B. The Planning Board shall approve, approve with conditions, or deny all applications for a conditional use permit. The applicant shall have the burden of proving that his or her application is in compliance with the requirements of this ordinance and that none of the conditions listed below would result from the approval of the conditional use permit. Failure of the applicant to submit required information shall constitute a basis for denial without a review of the remainder of the application. After the submission of a complete application and a review of the required submissions, the Planning Board shall approve the application or approve it with conditions if the application meets the following standards:
 1. The proposed use meets specific requirements set forth in this ordinance and would be in compliance with applicable state or federal laws; The proposed use will comply with all State and local Codes and Ordinances;
 2. The proposed use would not create fire safety hazards by providing adequate access to the site, or to the buildings on the site, for emergency vehicles and would not create hazards through the storage of chemicals and wastes;
 3. The proposed exterior lighting, where allowed, would not create hazards to motorists traveling on adjacent public streets or is adequate for the safety of occupants or users of the site or would not damage the value and diminish the usability of adjacent properties;
 4. The provisions for buffers and on-site landscaping provide adequate protection to neighboring properties from detrimental or unsightly features of the development;

2024.35 Conditional Use Permit for Arc-En-Ciel Peaceful Place to Grow and Learn LLC at 25 Green Street (Tax Map 38, Lot 263) in the MSRD-2 Zone.

Planning Board Meeting Date: August 7, 2024 at 6:00 PM

5. The proposed use would not have a significant, detrimental effect on the use and peaceful enjoyment of abutting property as the result of noise, vibrations, fumes, odor, dust, glare, hours of operation, or other causes;
6. The provisions for vehicular loading and unloading and parking and for vehicular and pedestrian circulation on the site and onto adjacent public streets would not create hazards to public safety or traffic congestion;
7. The proposed use would generate a volume of traffic that can reasonably be accommodated by the existing road network, or would not create unreasonable traffic hazards or would not exacerbate an existing traffic hazard, or would not create unreasonable traffic congestion;
8. The proposed use would not have a significant, detrimental effect on the value of adjacent properties which could be avoided by reasonable modification of the proposal;
9. The proposed use would not have an adverse impact on the privacy of the residents of the immediate area (within 500 feet) which could be avoided by reasonable modification of the proposal;
10. The proposed use would be in compliance with Biddeford's Comprehensive Plan;
11. The proposed use would not have an adverse impact on the immediate neighborhood or the community relative to architectural design, scale, bulk and building height, identity and historical character, or visual integrity, which could be avoided by reasonable modification of the proposal;
12. The design of the site would not result in significant flood hazards or flood damage or would be in conformance with applicable flood hazard protection requirements;
13. Adequate provision has been made for disposal of wastewater or solid waste or for the prevention of ground or surface water contamination;
14. Adequate provision has been made to control erosion or sedimentation;
15. Adequate provision has been made to handle stormwater runoff or other drainage problems on the site; and the proposed development will not unduly burden off-site surface water systems;
16. The proposed water supply would meet the demands of the proposed use for fire protection purposes;
17. Adequate provision has been made for the transportation, storage, and disposal of hazardous substances and materials as defined by state law;
18. The proposed use would not have an adverse impact on scenic vistas or on significant wildlife habitat or wetland areas and water bodies which could be avoided by reasonable modification if the proposal;
19. When located in the Shoreland Zone, the proposed use would meet the purposes of Shoreland Zoning as identified in Article XIV, Section 1 (Purposes) of this ordinance.

2024.35 Conditional Use Permit for Arc-En-Ciel Peaceful Place to Grow and Learn LLC at 25 Green Street (Tax Map 38, Lot 263) in the MSRD-2 Zone.

Planning Board Meeting Date: August 7, 2024 at 6:00 PM

C. WAIVERS REQUESTED / REQUIRED:N/A

6. NEXT STEPS/SUGGESTED ACTIONS

Recommend that if the Planning Board approves the Conditional Use Permit it be approved with the following minimum conditions of approval:

1. Standard Conditions of Approval apply.
2. The applicant shall obtain all other pertinent local, state and federal permits/licenses/insurance such as building, electrical, plumbing, etc., prior to commencing business.

7. SAMPLE MOTIONS:

A. Motion to approve Case # 2024.35 The Conditional Use Permit, Findings of Facts and Conclusions of Law for Home Day Care facility called Arc-En-Ciel Peaceful Place to Grow and Learn LLC located at 25 Green Street (Tax Map 38, Lot 263).

B. Motion to Table Case # 2024.35 The Conditional Use Permit, Findings of Facts and Conclusions of Law for Home Day Care facility called Arc-En-Ciel Peaceful Place to Grow and Learn LLC located at 25 Green Street (Tax Map 38, Lot 263)., based upon the following reasons:

a) _____

b) _____

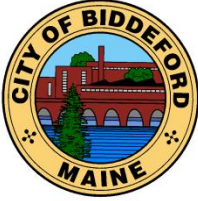
c) _____

C. Motion to Deny Case # 2024.35 The Conditional Use Permit, Findings of Facts and Conclusions of Law for Home Day Care facility called Arc-En-Ciel Peaceful Place to Grow and Learn LLC located at 25 Green Street (Tax Map 38, Lot 263), based upon the following reasons:

a) _____

b) _____

c) _____



CITY OF BIDDEFORD

Planning and Development Department

Adi Iriqat
Assistant City Planner
205 Main Street
P.O. Box 586
Biddeford, ME 04005
(207)-284-9115
adi.iriqat@biddefordmaine.org

FINDINGS OF FACT AND CONCLUSIONS OF LAW

Conditional Use Permit Day Care Facility 25 Green Street, Biddeford, ME Case # 2024.35 – August 7, 2024

Pursuant to the provisions of the City of Biddeford Land Development Regulations, Article VI (Performance Standards), Section 22 –Day Care Facilities, the Biddeford Planning Board has considered the application of Christine Biyoga to open a child care facility in a residential building, including supportive data, public hearing testimony and related materials contained in the record. Based on Public Comment and Staff's review and recommendation, the Planning Board makes the following Findings of Fact and Conclusions of Law:

1. PROJECT DATA/INFORMATION

1.	Applicant:	Christine Biyoga 28 ½ Holly Street Portland, ME 04103
2.	Owner of Property:	Biddeford Housing Authority 22 South Street Biddeford, ME, 04005
3.	Agent:	Same as applicant
4.	Engineer:	N/A
5.	Project Location:	25 Green Street
6.	Project Tax Map #/Lot #:	Tax Map 38, Lot 263
7.	Lot Size:	0.27
8.	Base Zoning:	MSRD-2
9.	Overlay Zoning:	N/A
10.	Existing Use:	Residential
11.	Proposed Use:	Addition of a facility-based child-care
12.	Approvals Required:	Conditional Use Permit
13.	Uses in the Vicinity:	Residential
14.	Number of Lots/Units in Subdivision:	N/A
15.	Minimum Lot Size Required: Provided:	2000 S.F per unit 10,000 S.F
16.	Frontage Required: Provided:	50' >76'
17.	Front Setback Required: Provided:	15' 6'

FINDINGS OF FACT AND CONCLUSIONS OF LAW

Conditional Use Permit

Day Care Facility

25 Green Street, (Tax Map 38, Lot 263)

Case # 2024.35 – August 7, 2024

18.	Side Setbacks Required: Provided:	10' >27'
19.	Rear Setback Required: Provided:	10' >50'
20.	Height Requirements: Provided:	35 feet or 3 stories 35 feet
21.	Water Supply:	Public Water
22.	Sewage Disposal:	City of Biddeford
23.	Solid Waste Disposal:	N/A
24.	Fire Protection:	City of Biddeford
25.	Floodplain Status:	Property is not within a NFIP Zone A or V flood zone
26.	Wetland/Surface Water Impacts:	None
27.	Soil Study Provided:	N/A
28.	Parking Spaces Required:	1 Space for every 4 Children Facility is Licensed to Care = 3
29.	Parking Spaces Provided (total): # Handicapped Spaces:	15+/- and on-street parking
30.	Ownership of Road:	Green Street is a Public Road
31.	Impervious Surface Area:	0 SF Change
32.	Total Disturbed Area:	0 SF of Previously Undisturbed Area
32.	Estimated Site Development Costs:	N/A
33.	Financial Capacity Letter:	N/A
34.	Waivers Needed:	N/A
35.	Waivers Granted:	N/A
36.	Variances Needed for Approval:	None
37.	Other Permits Obtained:	N/A
38.	Other Non-City Permits Required:	None
39.	Covenants, By-laws, Restrictions Required:	None
40.	Fees Paid:	Yes
41.	Planning Board Review History:	August 7, 2024-Conditional Use Permit

2. EXISTING CONDITIONS

The existing building is a three-story residential structure.

3. PROJECT PROPOSAL

Home Day-Care Facility (up to 12 children)

FINDINGS OF FACT AND CONCLUSIONS OF LAW

Conditional Use Permit

Day Care Facility

25 Green Street, (Tax Map 38, Lot 263)

Case # 2024.35 – August 7, 2024

A. **Performance Standards:** The Board made the following conclusions in their review standards of Article VI (Performance Standards), Section 22 (Day Care Facilities) states as follows:

1. The proposed use meets specific requirements set forth in this ordinance and would be in compliance with applicable state or federal laws; The proposed use will comply with all State and local Codes and Ordinances;
2. The proposed use would not create fire safety hazards by providing adequate access to the site, or to the buildings on the site, for emergency vehicles and would not create hazards through the storage of chemicals and wastes;
3. The proposed exterior lighting, where allowed, would not create hazards to motorists traveling on adjacent public streets or is adequate for the safety of occupants or users of the site or would not damage the value and diminish the usability of adjacent properties;
4. The provisions for buffers and on-site landscaping provide adequate protection to neighboring properties from detrimental or unsightly features of the development;
5. The proposed use would not have a significant, detrimental effect on the use and peaceful enjoyment of abutting property as the result of noise, vibrations, fumes, odor, dust, glare, hours of operation, or other causes;
6. The provisions for vehicular loading and unloading and parking and for vehicular and pedestrian circulation on the site and onto adjacent public streets would not create hazards to public safety or traffic congestion;
7. The proposed use would generate a volume of traffic that can reasonably be accommodated by the existing road network, or would not create unreasonable traffic hazards or would not exacerbate an existing traffic hazard, or would not create unreasonable traffic congestion;
8. The proposed use would not have a significant, detrimental effect on the value of adjacent properties which could be avoided by reasonable modification of the proposal;
9. The proposed use would not have an adverse impact on the privacy of the residents of the immediate area (within 500 feet) which could be avoided by reasonable modification of the proposal;
10. The proposed use would be in compliance with Biddeford's Comprehensive Plan;
11. The proposed use would not have an adverse impact on the immediate neighborhood or the community relative to architectural design, scale, bulk and building height, identity and historical character, or visual integrity, which could be avoided by reasonable modification of the proposal;
12. The design of the site would not result in significant flood hazards or flood damage or would be in conformance with applicable flood hazard protection requirements;

FINDINGS OF FACT AND CONCLUSIONS OF LAW

Conditional Use Permit

Day Care Facility

25 Green Street, (Tax Map 38, Lot 263)

Case # 2024.35 – August 7, 2024

13. Adequate provision has been made for disposal of wastewater or solid waste or for the prevention of ground or surface water contamination;
14. Adequate provision has been made to control erosion or sedimentation;
15. Adequate provision has been made to handle stormwater runoff or other drainage problems on the site; and the proposed development will not unduly burden off-site surface water systems;
16. The proposed water supply would meet the demands of the proposed use for fire protection purposes;
17. Adequate provision has been made for the transportation, storage, and disposal of hazardous substances and materials as defined by state law;
18. The proposed use would not have an adverse impact on scenic vistas or on significant wildlife habitat or wetland areas and water bodies which could be avoided by reasonable modification if the proposal;
19. When located in the Shoreland Zone, the proposed use would meet the purposes of Shoreland Zoning as identified in Article XIV, Section 1 (Purposes) of this ordinance.

APPROVAL GRANTED: Based on the evidence available and the conclusions above, the Biddeford Planning Board approves the Conditional Use Permit for the proposed project summarized above, located at 25 Green Street in accordance with the submitted application, supporting data, representations made, other related materials on file, and the following Conditions of Approval:

1. The material provided for the proposed project has been reviewed only for general conformance to the City technical requirements. The applicant(s) and/or their technical consultant shall be responsible for the actual design details and completeness of their work. It is incumbent upon the applicant(s) to ensure that the project is in conformance and complies with all City Codes, ordinances and regulations as well as with all state regulations, including, but not limited to, space and bulk standards, performance standards, use standards and other zoning type requirements.
2. All work shall be in conformance with the approved plans and submission documents. No deviations from the approved plans are permitted without prior approval from the Planning Board for major changes, and from the City Planner and City Engineer for minor changes. The City Planner shall make the determination of major or minor.
3. The applicant shall obtain all other pertinent local, state and federal permits, licenses, and insurance such as blasting, building, electrical, plumbing, etc. prior to commencing business.
4. At the completion of the project the owner/applicant shall request a final inspection. This request shall be directed to the Code Enforcement Office and Fire Department. A

FINDINGS OF FACT AND CONCLUSIONS OF LAW

Conditional Use Permit

Day Care Facility

25 Green Street, (Tax Map 38, Lot 263)

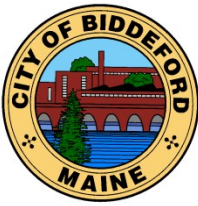
Case # 2024.35 – August 7, 2024

Certificate of Occupancy shall not be issued until the project is in compliance with the approval and all applicable City Ordinances.

5. The applicant shall obtain all other pertinent local, state and federal permits/licenses/insurance such as building, electrical, plumbing, etc., prior to commencing business.
6. Should the project require an outdoor play area in the future, it will require, at minimum approval from the City Planner after consultation with the City's Staff Review Committee (SRC).

Date: _____

Mr. Larry Patione
Planning Board Chairman



CITY OF BIDDEFORD

Planning and Development Department

Adi Iriqat
Assistant City Planner
205 Main Street
P.O. Box 586
Biddeford, ME 04005
(207)-284-9115
adi.iriqat@biddefordmaine.org

LETTER OF CONFIRMATION

TO: Christine Biyoga

FROM: Adi Iriqat, Assistant City Planner

DATE: June 26, 2024

**RE: Letter of Intent requesting to operate a day-care home called Arc-En-Ciel
Peaceful Place to Grow and Lean LLC at 25 Green St, Map 9, Block 38.**

Thank you for submitting a planning board application on June 14, 2024. The property is located at 25 Green Street in MSRD2 Zone which is primarily residential. A child care facility in MSRD2 is classified as a **conditional use**. As such, a day-care home facility **requires** a conditional use permit from the Planning Board.

The application will go through the Staff Committee for a review before seeking approval from the Planning Board. We do require payment prior to assigning you to a Planning Board agenda.

June 24th, 2024

To: Scott Welton, Fire and Life Safety Inspector

Code Enforcement Office

City of Biddeford, Maine

From: Christine Biyoga

RE: Formal Letter of Intent

Mr. Welton,

My name is Christine Biyoga and I reside at 28 ½ Holly Street in Portland. Please accept this as my formal **Letter of Intent** requesting to open a child care facility at 25 Green Street in Biddeford, Maine, property of Biddeford Housing Authority, **Map 9, Block 38**. My business name is Arc-En-Ciel Peaceful Place to Grow and Learn LLC. If approved, I will offer childcare for up to 12 children ages 6 weeks ages 12 years old, encompassing day-long care as well as before/after school care for older children. One of the children will be my 7-year-old daughter. As my business grows, I will need to add one employee to reach the full capacity of 12 children. The hours of operation will be from 7:30am-4:30pm, Monday through Friday. Children who attend will all receive quality early education focused on their individual needs. The childcare will feature an outdoor space for supervised activities.

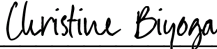
I am working with Coastal Enterprise Inc's Child Care Business Lab, a program designed to support entrepreneurs with the necessary education and resources to successfully start a child care business. I am also working with the United Way of Southern Maine and the Biddeford Housing Authority.

Attached for your review please find: my Planning Board Application form; the project narrative; site and floor plans for 25 Green Street; photos of the classroom; a landlord approval letter from Guy Gagnon, Executive Director of Biddeford Housing Authority; documentation provided by Guy regarding waivers the city granted for parking spaces in 2019; a letter of support from Rebecca Alfredson, Director of Education for the United Way of Southern Maine; and a copy of my CDA.

Thank you for your assistance in helping me take the next steps in the process. I look forward to having you tour my proposed site. I can be reached at 207-518-0593 to arrange for your visit.

My best,

Christine Biyoga

DocuSigned by:

3EEA706C608B4AF...

Revised: May 17, 2022

**City of Biddeford – Planning Department****Planning Board Application**

P.O. Box 586, 205 Main Street Biddeford, Maine 04005

207-284-9115

Type of Application:☐ Shoreland Zoning Permit☐ Site Plan Review☐ Extraction☒ Conditional Use Permit☐ Subdivision☐ Private Way☐ Other: _____**Applicant Information:**Name: Christine BiyogaMailing Address: 2812 Holly Street, Portland ME 04103Telephone: 207-518-0593Email: Chris.Fibi.06@gmail.com

What is your legal interest in the property?

☐ Owner☐ Potential Buyer with Contract☒ Lease/Rental Agreement**Owner's Information:**Name: Biddeford Housing AuthorityMailing Address: 22 South Street, Biddeford ME 04005Telephone: 207-282-6537Email: ggagnon@bhousing.org**Agent's Information:**

Name: _____

Mailing Address: _____

Telephone: _____

Email: _____

Engineer/Surveyor's Information:

Name: _____

Mailing Address: _____

Telephone: _____

Email: _____

Project Location and Lot Information:Street Address: 25 Green Street, Biddeford ME 04005 Drainage Watershed: _____Tax Map: Map 9Lot: 38

Current Zoning: _____

Shoreland Zoning: _____

Size of Lot: _____ () acres () s.f.

Lot Frontage: _____

Existing Use of Property: _____

Property currently serviced by:☒ City Road☒ Public Sewer☒ Public Water☒ Public Trash☐ Private Road ☐ Septic System☐ Private Well☐ Private Hauler**Slope Conditions in Area of Construction (if applicable):**☐ Flat (0-3% slope) ☐ Rolling (3-8% slope) ☐ Hilly (8-15% slope) ☐ Steep (15%+ Slope)Are there any wetlands or waterbodies on the site? ☐ (Yes) ☒ (No) if yes attach informationIs the project within the 100-year floodplain? ☐ (Yes) ☒ (No) if yes attach informationDo you plan to bring fill onto the lot? ☐ (Yes) ☒ (No) If yes attach information

Description of proposed use of property:

Project/Proposed Use:

Addition of a facility-based child care.**Property to be Serviced by:**

☒ City Road ☒ Public Sewer ☒ Public Water ☒ Public Trash
☐ Private Road ☐ Septic System ☐ Private Well ☐ Private Hauler

Limits of Disturbance: N/A () acres () s.f.Net change in impervious cover: N/A () acres () s.f.Is this project part of a larger project? ☐ (Yes) ☒ (No)Is the project proposing a new Private or Public Road? ☐ (Yes, Private) ☐ (Yes, Public) ☒ (No)Is this project within the Urbanized Area/MS4 (see City Drainage Map) ☐ (Yes) ☒ (No)Is the project proposing any Stormwater facilities/BMPs? ☐ (Yes) ☒ (No)Will a Traffic Movement Permit (TMP) be required?: ☐ (Yes) ☒ (No)**If in a Shoreland Zone:**

Percent of residential lot coverage (Max 20%): _____

Percent of structure expansion (Max 30%): _____

If Subdivision Review, number of lots proposed: _____**If a Private Way is proposed, number of lots served:** _____**If Site Plan Review, you must provide the following information:**

Total new square feet footprint of structure: _____

Total new square feet paving/parking: _____

Waiver Requests (attach details):

1. _____
2. _____
3. _____
4. _____
5. _____

Required Submittal Attachments:

- A. Letters of Approval
 - ☐ Fire Department – Contact Chief or Deputy Chief – 282-9986
 - ☐ Ability to Serve for Water Service – Maine Water – 282-1543
 - ☐ Ability to Serve for Sewer Service – Engineering Department – Tom Milligan 284-9118
 - ☐ Police Department – e-911 Road Name Designation – Contact Joanne Fisk 282-5127
- B. Letter to Planning Board describing project, Waiver requests, proposed improvements, addressing permit requirements, etc.
- C. Photographs of Site.
- D. Architectural renderings/drawings of proposed buildings, as required.
- E. Engineering Plans, as required.
- F. Stormwater Management Report, as required.

Fees (Due at time of Submission):

- \$75 Nonrefundable Administration Fee is required for every application.
- Refer to "Attachment A Fees and Charges" of the Land Development Regulations for more information. Consult with Planning Staff if you have questions.

Required Signatures:

By signing this application, as the foresaid applicant or authorized agent:

- I certify that I have read and completely understand the application;
- I certify that the information contained in this application and its attachments are true and correct;
- I understand that all information provided on this form and all other documents submitted as part of my proposal is a matter of public record;
- I understand that copies of this information may be supplied upon request to an interested party.
- I understand that additional funds may be required through the course of the review for special studies, legal review costs, and/or engineering review.
- I understand that by submitting an application I am not guaranteed a place on any particular agenda. I further understand that the City Planner will place me on an agenda for review when the application is deemed substantially complete.

Will the proposed project cause 1 acre or more of site disturbance?: ☐ (Yes) ☒ (No)

- If Yes, applicant is responsible for any required Maine Construction General Permits and shall comply with the requirements of DEP Chapter 500 Stormwater Regulations, as they apply.

DocuSigned by:
Signature of Applicant: Christine Biaga DocuSigned by: 3EEA700C606B4A6... **Date** 6/14/2024 | 6:21 PM PDT
Signature of Property Owner: Guy Gagnon DocuSigned by: 2EBFDAF0E9B4402... **Date** 6/13/2024 | 10:13 AM EDT

DIGITAL SUBMITTAL REQUIREMENTS FOR ALL SUBMITTALS:

- A) PDF OF SIGNED APPLICATION
- B) PDFs OF ALL DRAWING SETS AND OTHER REQUIRED SUBMITTAL ATTACHMENTS NOTED ABOVE

HARD-COPY SUBMITTAL REQUIREMENTS FOR PLANNING BOARD APPLICATIONS:

- A) SEVEN (7) FULL-SIZE PAPER COPIES OF DRAWING SETS

DIGITAL SUBMITTAL REQUIREMENTS FOR FINAL APPROVAL:

- A) INDIVIDUALLY NAMED PDFs OF EACH DRAWING (NOT A COMBINED PDF SET)
 - Individual Drawing PDF Naming Format: 'PROJECT/SHEETSET NAME_INDIVIDUAL DRAWING NAME.pdf'
- B) PDF COPIES OF ALL PERMIT APPROVALS, APPLICATIONS, REPORTS, NARRATIVES, LETTERS, ETC.
- C) FINAL CAD REFERENCE FILES IN DWG FORMAT (SURVEY & PROPOSED DESIGN LINEWORK)
 - All drawings & CAD reference files must be to-scale and within the following coordinate systems:
 - MAINE STATE PLANE WEST NAD83 (Horizontal Datum) & NAVD88 (Vertical Datum)

HARD-COPY SUBMITTAL REQUIREMENTS FOR FINAL APPROVAL:

- A) THREE (3) FULL-SIZE PAPER COPIES OF INDIVIDUAL DRAWINGS REQUIRING BOARD SIGNATURE
- B) ONE (1) FULL-SIZE PAPER COPY OF ENTIRE DRAWING SET FOR ENGINEERING RECORDS

PLEASE CONFIRM WITH PLANNING STAFF FOR CLARIFICATION

Arc-En-Ciel Peaceful Place to Grow and Learn LLC

Project Narrative

25 Green Street, Biddeford, ME 04005

June 25, 2024

1) Project Description

Christine Biyoga seeks to apply for zoning approval for 25 Green Street in Biddeford to open Arc-En-Ciel Peaceful Place to Grow and Learn LLC, a small child care facility. Located in common space of a Biddeford Housing Authority building, the center will care for up to 12 children ages 6 weeks to 12 years old. Christine is working with full support of Guy Gagnon, BHA Executive Director, in addition to collaborating with the United Way of Southern Maine and CEI's Child Care Business Lab.

2) Roles and Responsibilities

Christine Biyoga will be the owner and director of Arc-En-Ciel Peaceful Place to Grow and Learn LLC. She is an early childhood educator with 5 years of experience. She began her career as a lead teacher for infants and toddlers, eventually transitioning to working as an ed tech with preschoolers. Christine earned her CDA in 2022 and is a patient professional who loves working with children and families. As described by one of her colleagues, "Caring for children is in Christine's nature."

3) Mentor and Community Support

- Guy Gagnon is the Executive Director of Biddeford Housing Authority. Christine will rent the first floor of 25 Green Street from him to operate the business. Guy is enthusiastic about the opportunity for BHA residents to access quality care for their children and is fully supportive of the project (see "Landlord Approval Letter").
- The United Way of Southern Maine facilitated the connection between Guy and Christine. They continue to be supporters of the project as they want to see Christine succeed as a business owner and give back to the community (see "Letter of Support").
- CEI's Child Care Business Lab is a team based out of Brunswick who is helping Christine navigate the child care licensing process and set her business up for financial success. They are also helping her to apply for the Maine State Child Care Infrastructure Grant Program, funding which would cover many of Christine's startup costs. Christine has been involved with the Child Care Business Lab since 2023.

4) Project Goals and Outcomes

Arc-En-Ciel Peaceful Place to Grow and Learn LLC is an early learning center whose goal is to treat every child as an individual and encourage them to learn through play. As the director, Christine will welcome children and families into the space to build community and trust. She will help children reach their developmental milestones and collaborate with support services as needed. Christine will teach children to communicate through sign language and French. Families will initially provide their own meals for their children, but in the future Christine hopes to cook meals fresh. Snacks will be provided.

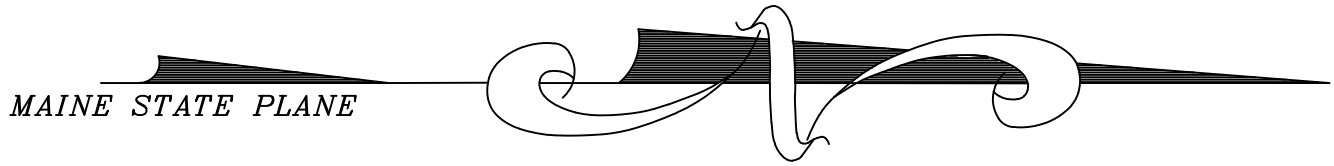
As an entrepreneur, Christine will be creating a good job for herself as a new business owner. She also plans to hire one staff member to help care for the 12 children and maintain state-mandated ratios. Because Arc-En-Ciel Peaceful Place to Grow and Learn LLC will be in a Biddeford Housing Authority space, slots will be prioritized for BHA families. This will have a huge impact on the lives of parents who are hoping to return to the workforce but are struggling to find quality care.

5) Parking Plan

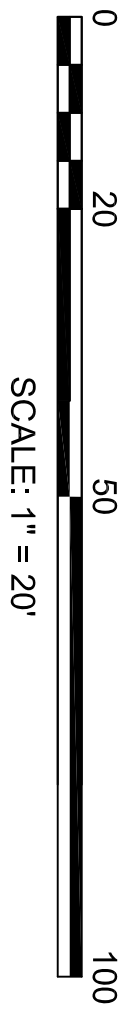
As raised during discussions with the City of Biddeford's Planning Office, parking is a key concern. In 2019, the Planning Board waived the requirement for ten off-street parking spaces and allowed only five off-street (on-site) parking spaces (see "Notice of Decision- March 11, 2019"). Currently only three resident vehicles are using the site which is typical for the low-income housing area. BHA proposes that one space out back be used for staff parking and that a drop-off space be created adjacent to the front driveway entrance by slightly widening the entry drive. All other parking would be located on the street.

6) Outdoor Space

The Maine Facility Child Care Rule book states that children shall have a minimum of 60 minutes of active play outdoors daily. Currently 25 Green Street has a paved back area. Guy Gagnon and Christine have discussed laying down turf (or a similar play-safe material) and fencing in the area for outdoor play.



- LEGEND**
- △ SURVEYORS TRAVERSE POINT
 - FOUND IRON ROD OR PIPE
 - PROPERTY LINE
 - ABUTTERS PROPERTY LINE
 - - - SETBACK LINE
 - N/F NOW OR FORMERLY
 - UTILITY POLE
 - OVERHEAD UTILITIES
 - EXISTING FIRE HYDRANT
 - ⊙ SEWER MANHOLE
 - ⊙ DRAIN MANHOLE
 - CATCH BASIN
 - ⊕ WATER SHUTOFF



NOTES:

- RECORD OWNER: HOUSING OPTIONS LLC
13 CROSS STREET
SACO, MAINE
- NAME OF APPLICANT: BIDDEFORD HOUSING
22 SOUTH STREET
BIDDEFORD, MAINE
- TAX MAP 38, LOT 263
- TOTAL AREA OF PROPERTY 10,000 SQUARE FEET, MORE OR LESS.
- PROPERTY IS LOCATED IN THE MSRD ZONE
- THE PROJECT HORIZONTAL DATUM: MAINE STATE PLANE COORDINATE SYSTEM, MAINE WEST ZONE. PROJECT VERTICAL DATUM: NORTH AMERICAN DATUM 1988 (NAVD88). ALL DATA WAS DERIVED USING LEICA GS14 REAL TIME KINEMATICS GPS.
- PROPERTY TO BE SERVED BY PUBLIC SEWER, PUBLIC WATER, NATURAL GAS AND OVERHEAD UTILITIES.
- THE PARKING SHALL BE PAINTED WITH 4 INCH STRIPES TO DELINEATE PARKING STALLS.
- NUMBER OF PARKING SPACES REQUIRED IS 10. THE NUMBER OF PARKING SPACES PROVIDED IS 6 (INCLUDING 1 HANDICAP). THE APPLICANT IS REQUESTING A WAIVER FROM THE PARKING STANDARDS.

LOCUS DEED REFERENCE:

- A. WARRANTY DEED STEPHEN J. RYAN AND JAMES C. BISHOP TO HOUSING OPTIONS, LLC DATED NOVEMBER 14, 2003 AND RECORDED IN THE YORK COUNTY REGISTRY OF DEEDS IN BOOK 13805, PAGE 34.

PLAN REFERENCE:

- A. CITY OF BIDDEFORD AS-BUILT SEWER AND STORM PLAN REVISED MAY 2010 FILE #TD-1763.

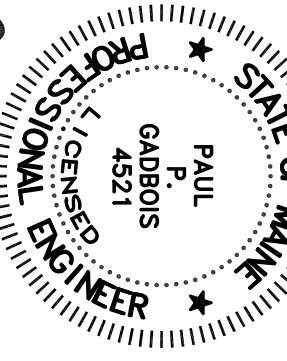
ZONE REQUIREMENTS: MSRD2

- MIN. LOT SIZE 2,000 SF PER UNIT
MIN. STREET FRONTAGE 50 FEET
MIN. FRONT YARD 15 FEET
MIN. REAR AND SIDE YARD 10 FEET
MAX. HEIGHT 35 FEET

LOT COVERAGE			
	EXISTING	PROPOSED	
BUILDING	3,250 SF	2,304 SF	
PAVEMENT	6,175 SF	4,160 SF	
TOTAL	9,425 SF	6,464 SF	

YORK,ss REGISTRY OF DEEDS
Received _____
at _____ h _____ m _____ M., and
Filed in Plan Book _____ Page _____
ATTEST: _____
Register

I HEREBY CERTIFY THAT THE INFORMATION SHOWN ON THIS PLAN IS CORRECT TO THE BEST OF MY KNOWLEDGE.



Paul P. Gadbois
PAUL P. GADBOIS, P.E. # 4521

APPROVAL
CITY OF BIDDEFORD
PLANNING BOARD

DATE	_____
CHAFFERSON	_____
_____	_____
_____	_____
_____	_____
_____	_____

SITE PLAN
BIDDEFORD HOUSING
25 GREEN STREET
BIDDEFORD, MAINE

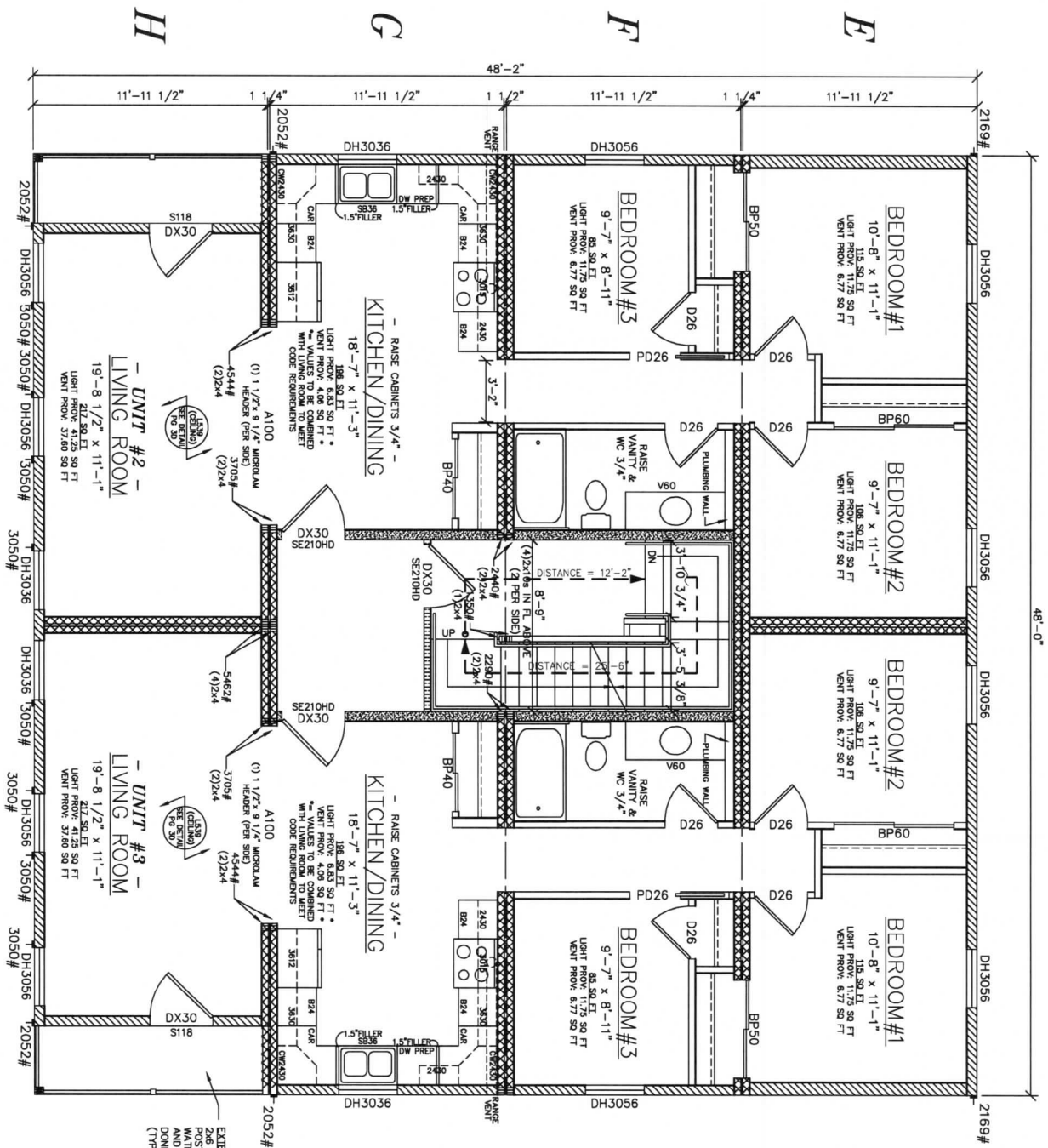
NAME OF APPLICANT
BIDDEFORD HOUSING
22 SOUTH STREET
BIDDEFORD, MAINE 04005

DRAWN: P.P.G.	REVISIONS:
CHECKED: P.P.G.	
SCALE: 1"= 20'	
FIELD BOOK:	
DATE: 01-15-2019	
JOB NO. 1703	
SHEET 1 OF 1	

PAUL P. GADBOIS
ENGINEERING SURVEYING
LAND PLANNING
P.O. BOX 327, SACO, MAINE 04072
(207) 283-3980





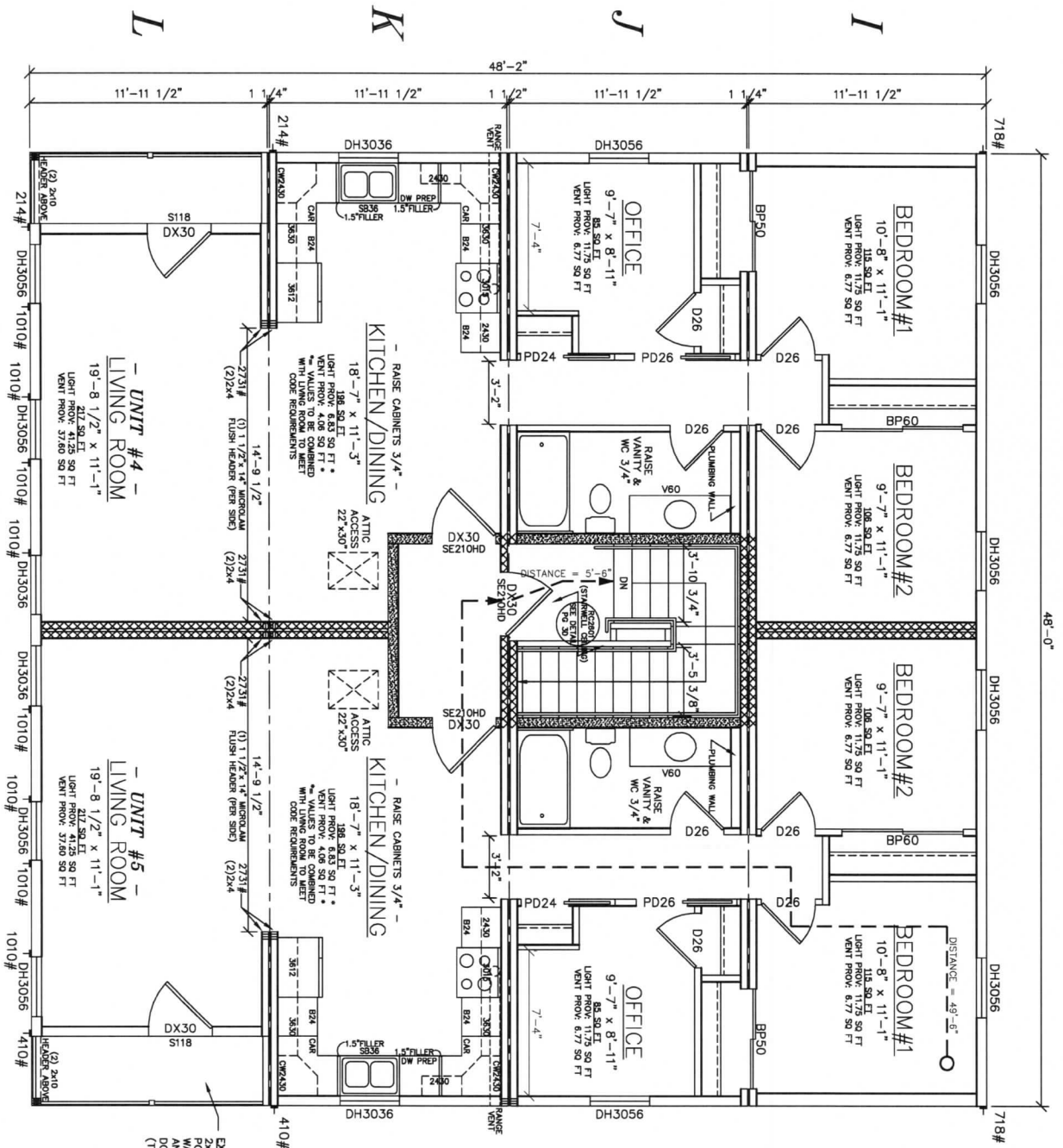


SEE STANDARD NOTES & DETAILS DWG #8

USE GROUP: R2 CONST. TYPE: VB DESIGNER: C. LARRY NAGA DATE: 05/07/19 SCALE: 1/4" = 1'-0" PAGE: 3B	BUILDER: EXQUISITE HOMES 41 SMITH RD MAPLETON, ME 04787	HOMEOWNER: BIDDEFORD HOUSING GUY GAGNON SITE: 25 GREEN ST BIDDEFORD, ME 04005	SERIAL No. 19057 PRODUCTION No. REVISION DATE 06/14/19 09/03/19 09/06/19 12/03/19 12/12/19 CHECK DATE	PE / RA THIRD PARTY INSPECTION AGENCY
--	--	--	---	--

MULTI-FAMILY BLD CTM-R
SECOND FLOOR PLAN

Westchester Modular Homes Inc
 30 Reagans Mill Road, Wingdale, New York, 12594
 Tel (845)832-9400 Fax (845)832-6698



NOTES:
- 2x10 SFR#2 @ 12" O.C. FLOOR FRAMING FOR COMMON HALLWAYS
- AND COMMUNITY ROOM
- ANDERSEN 200 SERIES WINDOWS (6 OVER 1 GRILLE PATTERN)
- R49 INSULATION IN SLOPED ROOF.
- R38 INSULATION IN FLAT ROOF COMPRESSED TO R32 +/-

NOTE:
- WINDOWS WITH A SILL HEIGHT LESS THAN 24" ABOVE FINISHED FLOOR AND WITH A EXT. HEIGHT OF GREATER THAN 6'-0" TO GRADE SHALL BE EQUIPPED WITH FALL PROTECTION SUPPLIED AND INSTALLED BY B/P ON SITE IN ACCORDANCE W/ R312.2

LOAD (lbs) AND REQUIRED LOAD (BY B/P-U.O.M.)

NOTES:
- ALL FRAMING LUMBER-SFR #2
- ALL MICROUM
- Fb-2850 psi
- ALL EXTERIOR DOORS
- HEADERS (22x10" SFR#2 UNLESS OTHERWISE NOTED)

FIRE SEPARATION LEGEND

[Pattern]	= U376-A
[Pattern]	= U376-B
[Pattern]	= U376-C
[Pattern]	= U356

SEE STANDARD NOTES & DETAILS DWG #8

USE GROUP: R2 CONST. TYPE: VB DESIGNER: C. LARRY NACA DATE: 05/07/19 SCALE: 1/4" = 1'-0" PAGE: 3C	BUILDER: EXQUISITE HOMES 41 SMITH RD MAPLETON, ME 04787 HOMEOWNER: BIDDEFORD HOUSING GUY GAGNON SITE: 25 GREEN ST BIDDEFORD, ME 04005	SERIAL No. 19057 PRODUCTION No. <table border="1"> <tr> <th>REVISION</th> <th>DATE</th> </tr> <tr> <td></td> <td>06/14/19</td> </tr> <tr> <td></td> <td>09/03/19</td> </tr> <tr> <td></td> <td>09/06/19</td> </tr> <tr> <td></td> <td>12/03/19</td> </tr> <tr> <td></td> <td>12/12/19</td> </tr> <tr> <th>CHECK</th> <th>DATE</th> </tr> </table>	REVISION	DATE		06/14/19		09/03/19		09/06/19		12/03/19		12/12/19	CHECK	DATE	PE / RA THIRD PARTY INSPECTION AGENCY
REVISION	DATE																
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	12/12/19																
CHECK	DATE																

MULTI-FAMILY BLD CTM-R
THIRD FLOOR PLAN

Westchester Modular Homes Inc
30 Reagans Mill Road, Wingdale, New York, 12594
Tel (845)832-9400 Fax (845)832-6698

Photos of 25 Green St.







Landlord Approval Letter

Date: 6-17-24

Re: Tenant Child Care Approval

To Whom It May Concern:

I, Guy M. Gagnon, Exec Dir. BHA (Landlord Name), hereby grant permission for
Christine Biyoga (Tenant Name) to use my property located at
25 Green St. first floor (Address), which they are renting from me, to operate a
child care business with a maximum number of 12 children as of tbd (Start Date)
and for the duration of their lease. If you have any questions regarding this correspondence, please contact
me at:

Property Owner Name: Biddeford Housing Authority (BHA)

Property Owner Mailing Address: 22 South St.

City, State, Zip Code: Biddeford, Me. 04005

Phone Number: 207-415-2939

Email Address: ggagnon@bhousing.org

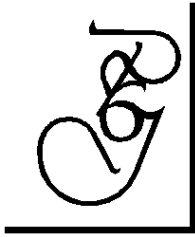
Sincerely,

Guy M. Gagnon
Exec Dir. BHA

Property Owner Name Print



Property Owner Signature



PAUL P. GADBOIS PE, PLS

Civil Engineering, Surveying, Land Planning
Structural Engineering, DEP Permitting

P.O. Box 327
Saco, ME 04072
Phone & Fax (207) 283-3980
Email: pgadbois53@gmail.com

Greg Tansley, Planner
City of Biddeford
P.O. Box 586
Biddeford, Maine

January 16, 2019

Re: Biddeford Housing, 25 Green Street, Tax Map 38 Lot 263

Dear Mr. Tansley:

The applicant has a purchase sales agreement and wishes to construct a 48 x 48 (2304 square foot) three story building to house 5 residential units.

The site originally had a 3-story 10 unit apartment building along with associated paved access and parking.

The applicant is proposing to use the existing access and paved parking. The project as designed reduces the overall impervious area by 30 %.

The applicant is requesting a waiver for the number of parking spaces. (See attached letter)

A lighting plan along with proposed landscaping will be included in future submissions.

If you have any questions, or need any additional information, please call.

Very truly yours,

Paul P. Gadbois, P.E., P.L.S.

CITY OF BIDDEFORD, MAINE
PLANNING BOARD
P.O. Box 586, 205 Main Street Biddeford, Maine 04005
207-284-9115

APPLICATION FORM

Type of Application:

☐ Shoreland Zoning Permit ☒ Site Plan Review ☐ Extraction
☐ Conditional Use Permit ☐ Subdivision ☐ Private Way
☐ Other: _____

Applicant Information:

Applicant's Name: BIDDEFORD HOUSING AUTHORITY
Applicant's Mailing Address: 22 SOUTH STREET BIDDEFORD
Applicant's Telephone: (207) 415-2939

What is Applicant's legal interest in the property?

☐ Owner ☒ Potential Buyer with Contract ☐ Lease/Rental Agreement

Owner's Name: _____
Owner's Address: _____
Owner's Telephone: _____

Agent's Name: PAUL P. GADBOIS
Agent's Address: P.O. Box 327 SACO, ME 04072
Telephone: (207) 283-3980

Engineer/Surveyor: PAUL P. GADBOIS
Engineer/Surveyor's Address: P.O. Box 327 SACO ME 04072
Telephone: (207) 283-3980

Project Location and Lot Information:

Street Address: 25 GREEN STREET
Tax Map: 38 Lot: 263
Current Zoning: MSRD-2 Shoreland Zoning: N/A

Size of lot: 10,000 ☐ acres ☒ s.f. Lot Frontage: 74'

Existing Use of Property: VACANT

Property currently serviced by:

☒ City Road	☐ Private Road
☒ Public Sewer	☐ Septic System
☒ Public Water	☐ Private Well
☒ Public Trash	☐ Private Hauler

Slope Conditions in Area of Construction (if applicable):

☒ Flat (0-3 % slope) ☐ Rolling (3-8% slope) ☐ Hilly (8-15% slope) ☐ Steep (15% + slope)

Are there any wetlands or waterbodies on the site? ☐ Yes ☒ No If yes, attach information

Do you plan to bring fill onto the lot? ☐ Yes ☒ No If yes, attach information

Description of proposed use of property:

Project/Proposed Use Description: CONSTRUCT 3-STORY, 5-UNIT RESIDENTIAL BUILDING. UTILIZE THE EXISTING PAVEMENT FOR ACCESS AND PARKING.

Property to be serviced by:

☒ City Road	☐ Private Road
☒ Public Sewer	☐ Septic System
☒ Public Water	☐ Private Well
☒ Public Trash	☐ Private Hauler

Is this project part of a larger project? ☐ Yes ☒ No

☐ If in a Shoreland Zone:

Percent of residential lot coverage (Max. 20%): _____

Percent of structure expansion (Max. 30%): _____

☐ If Subdivision Review, number of lots proposed: _____

☐ If a Private Way is proposed, number of lots served: _____

☒ If Site Plan Review, you must provide the following information:

Total new square feet footprint of structures: 2,304 SF

Total new square feet paving/parking: 4,160 SF

Waiver Requests (attach details):

1. PARKING REQUIREMENTS
2. _____
3. _____
4. _____
5. _____

Attachments:

A. Letters of Approval

- ☐ Fire Department - Contact Chief or Deputy Chief - 282-9986
- ☐ Ability to Serve for Water Service – Maine Water - 282-1543
- ☐ Ability to Serve for Sewer Service- Engineering Dept (Sewer) - Tom Milligan 284-9118
- ☐ Police Department - E-911 Road Name Designation - Contact Joanne Fisk - 282-5127

B. Letter to Planning Board describing project, waiver requests, proposed improvements, addressing permit requirements, etc.

C. Photographs of site.

D. Architectural renderings/drawings of proposed buildings, as required.

E. Engineered Plans, as required.

Fees (due at time of application):

Refer to "Attachment A Fees and Charges" of the Land Development Regulations for more information. Consult with Planning Staff if you have questions.

Required Signatures:

By signing this application, as the foresaid applicant or authorized agent:

- I certify that I have read and completely understand the application;
- I certify that the information contained in this application and it's attachments are true and correct;
- I understand that all information provided on this form and all other documents submitted as part of my proposal is a matter of public record;
- I understand that copies of this information may be supplied upon request to an interested party.
- I understand that additional funds may be required through the course of review for special studies, legal review costs, and/or engineering review.
- I understand that by submitting this application I am not guaranteed a place on any particular agenda. I further understand that the City Planner will place me on an agenda for review when the application is deemed substantially complete.

☐ Project proposed to have 1 acre or more of site disturbance:

-Project may need to apply for a Maine Construction General Permit and shall comply with the requirements of DEP Chapter 500 Stormwater Regulations, as they apply.

Signature of applicant:



Date: 1-15-19

Signature of owner of property:

Date: _____

**IF PLAN APPROVAL IS ANTICIPATED, PROVIDE 2 FULL SIZE MYLARS & 2 FULL SIZE PAPER COPIES FOR BOARD SIGNATURE (AS APPLICABLE).
CHECK WITH PLANNING STAFF FOR CLARIFICATION.**

CHECKLIST FOR SITE PLAN REQUIREMENTS

YES **NO**

- | | | |
|---|--------------------------|--|
| ☒ | ☐ | Be on sheet size of 24 by 36 inches. |
| ☒ | ☐ | The scale of said plan shall be not less than one inch equals 50 feet and shall be indicated on the plat by use of a bar scale. |
| ☒ | ☐ | The plan shall bear the date, title, north point. |
| ☒ | ☐ | The plan shall contain a location or vicinity sketch (suggested scale one inch equals 800 feet). |
| ☒ | ☐ | The plan shall contain the name and address of the developer and applicant. |
| ☒ | ☐ | All appropriate dimensional requirements. |
| N/A ☒ | ☐ | Existing and proposed easements. |
| N/A ☒ | ☐ | Plan of the site showing existing watercourses and water bodies, seasonal wet areas. |
| N/A ☒ | ☐ | Plan of the site showing soil type and location of test borings. |
| ☒ | ☐ | Location of all existing and proposed utilities. |
| ☒ | ☐ | Topographic contours (every five percent for zero to three percent slope; or every two feet for steeper areas). |
| ☒ | ☐ | Plan should include preservation and supplementation of existing dominant vegetation. |
| ☒ | ☐ | Plan shall indicate which features are to be retained and which are to be removed or altered. |
| ☒ | ☐ | Location of stonewalls, graveyards, fences, stands of trees, and other important unique natural areas and site features, including but not limited to floodplains, deer wintering areas, significant wildlife habitats, fisheries, scenic areas, habitat for rare and endangered plants and animals, unique natural communities and natural areas, sand and gravel aquifers, and historic and/or archaeological resources, together with description of such features. |
| ☒ | ☐ | Plan view of all buildings with their use, size, location, and first-floor elevation in respect to grade. |
| ☒ | ☐ | Standard elevation view of existing and proposed buildings or structures on-site. |

YES NO

- ☒ ☐ Outline of any buildings located within 200 feet of such existing or proposed buildings or structures indicating their shape, size, location, heights and volume.
- ☒ ☐ Existing use of abutting properties shall be identified with approximate location of any structures thereon including access roads.
- ☒ ☐ Location, width, curbing, and paving of access ways, egress ways, and streets within the site for both pedestrian and vehicular use.
- ☒ ☐ The location of off-street parking and loading spaces with a layout of the parking indicated.
- ☒ ☐ The size and proposed location of water mains and sanitary sewerage facilities will all necessary engineering data.
- ☒ ☐ The size and location of all other existing and proposed public service connections including, without limitation, gas lines, power lines, telephone lines, and fire alarm connections and locations, indicating whether above or below ground.
- N/A ☒ ☐ The type, nature, and composition of all solid, liquid, and gaseous waste, industrial or otherwise, and the location, type, and design criteria of the storage and disposal facilities dealing with such waste.
- ☐ ☒ A landscape plan and open space areas indicating grade change, vegetation to be preserved, new plantings used to stabilize areas of cut and fill, screening; plus size, location, purpose and type of vegetation. **TO BE SUBMITTED**
- ☒ ☐ A drainage plan including location, elevation, layout of catch basins and other surface and subsurface drainage features.
- N/A ☒ ☐ Location, size and design of proposed signs and other advertising or instructional devices.
- ☒ ☐ Existing and proposed contours and finished grade elevations as well as the type, extent, and location of existing and proposed landscaping and open space areas which will be retained.
- ☐ ☒ Location and type of lighting for outdoor facilities. **TO BE SUBMITTED**
- ☒ ☐ Lines of existing and proposed abutting streets showing width.
- ☒ ☐ Surveyed property lines showing their bearing and distances and monument locations.
- N/A ☒ ☐ If subdivision is involved, the lines and names of all proposed streets, lanes, ways, or easements intended to be dedicated for public or private use.

YES **NO**

- n/A ☒ ☐ Provide copies of any covenants or restrictions that are intended to cover all or part of the land area to be developed.
- n/A ☒ ☐ Indicate limits of the wetland areas on the property.
- ☒ ☐ Delineate existing zoning boundaries within 1,000 feet of the site.
- ☒ ☐ Stamp and signature of either a Maine licensed land surveyor, professional engineer, or architect responsible for said plan.
- ☐ ☒ Any other exhibits or data deemed necessary by the Planning Board to evaluate the proposed development for site plan review purposes.

PURCHASE AND SALE AGREEMENT

THIS AGREEMENT made and entered into as of September 1, 2018, by and between Housing Options LLC of Saco, Maine, with a mailing address 13 Cross St Saco, ME, 04072, Maine 04072 ("Seller") and BIDDEFORD HOUSING AUTHORITY, a Maine nonprofit corporation with a place of business in Biddeford, Maine and mailing address of 22 South Street, Biddeford, Maine 04005, or its assignee (the "Buyer")

WITNESSETH:

FOR VALUABLE CONSIDERATION, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

1. Property to be Sold. Seller agrees to Sell and Buyer agrees to buy a certain parcel of land with improvements thereon, located at 25 Green Street, Biddeford, Maine and described as Map 38: Lot 263 in the tax maps of the Town of Biddeford (collectively, the "Premises"). Included in the sale of the Premises shall be all personal property owned by Seller and located at the Premises as of July 16, 2018 (the "Personal Property"). If a survey is necessary, the Buyer shall pay for the cost of a survey.

2. Purchase Price. Subject to the adjustments and prorations hereinafter described, Buyer agrees to pay for the Premises the sum of Seventy-Five Thousand Dollars (\$75,000.00) (the "Purchase Price"), payable as follows:

(a) Deposit. Two Thousand Dollars (\$2,000.00) as a deposit (the "Deposit") to be paid at the time of the execution of this Agreement. The Deposit shall be kept in a non-interest-bearing account and shall be credited toward the Purchase Price at the closing. Except as otherwise provided in this Agreement, the Deposit shall be fully refundable.

(b) Balance at Closing. The balance of the purchase price, Seventy-three Thousand Dollars (\$73,000.00) shall be paid by certified check, bank cashier's check or wire transfer at the closing.

3. Title. Seller shall convey the Premises to Buyer at the closing in fee simple with good and marketable title, free and clear of all liens, claims and encumbrances. If title to the Premises shall not be good and marketable or shall prove to be defective in any respect, Buyer shall so notify Seller no later than thirty (30) days prior to the Closing Date. In the event that Seller is unable to convey title as aforesaid, Seller shall be given a reasonable period of time (not to exceed 30 days), after notice in writing, in which to remedy any title defects. Seller shall use diligent efforts to remedy any title defects. In the event that said defects cannot be corrected or remedied, then this Agreement, and Seller's and Buyer's obligations hereunder, will terminate and the Deposit shall be returned to Buyer. Buyer may, at Buyer's option, elect to close notwithstanding such defects as may exist.

4. Closing. This transaction shall be closed on the later of October 31, 2018 or 7 days after receiving final city codes and planning department approval of proposed improvements (the "Closing Date") at the offices of Buyer's counsel, or if the Seller and Buyer shall mutually agree in advance, at another time and place. At the closing, Seller shall execute and deliver to Buyer, against payment of the balance of the purchase price, a Quitclaim Deed with Covenant (the "Deed"). In addition, Seller shall execute and deliver a warranty bill of sale for all personal property to be transferred to Buyer and such other customary transfer documents as Buyer may reasonably request, including without limitation, a seller's affidavit for title insurance purposes, a FIRPTA affidavit, an underground storage tank notification and disclosure form, REW forms and a transfer tax form.

5. Risk of Loss, Damage, Destruction and Insurance. Before closing, Seller shall bear the risk of any loss to the Premises by fire or otherwise. Seller agrees to maintain casualty insurance or self-insurance under its self-insurance program upon the Premises in an amount equal to at least the purchase price. In the event of any casualty loss, either Buyer or Seller shall have the right to terminate this Agreement by written notice, whereupon Buyer shall receive back the Deposit.

6. Representations and Warranties of Seller. Seller represents and warrants to Buyer as follows:

(a) There is no litigation, administrative hearing, arbitration, or any other proceeding pending or, to the knowledge of Seller, threatened against Seller with respect to the Premises or the Personal Property with respect to any violation of law, rule or regulation.

(b) Seller has received no written notice from any governmental body or agency alleging a violation of any environmental, zoning or land use law, rule, regulation or ordinance.

(c) Seller is in good standing under the laws of Maine and has all necessary power and authority to enter into this Agreement and to transfer the Premises to Buyer as provided hereunder.

(d) Seller makes no representations or warranties concerning the condition of the improvements on the Premises. Such improvements are conveyed AS IS, WHERE IS.

7. Inspection. At all reasonable times upon reasonable prior notice, Buyer shall have the right to enter the Premises and perform, at Buyer's expense, any and all inspections, tests, surveys or other due diligence inquiries with respect to the Premises as Buyer deems necessary or appropriate. Buyer agrees to return the Premises as nearly as possible to their original condition after all of such tests and inspections. Seller shall provide Buyer with access to all information and records in Seller's possession relating to the Premises and Personal Property. Seller shall cooperate with Buyer in such inspections, but without being required to expend any funds in doing so. In the event Buyer is not satisfied for any reason with the results of such due diligence inspections, Buyer shall have the option of terminating this Agreement by written notice to Seller and receiving back the Deposit. Buyer's option to terminate this Agreement and receive back the Deposit as provided in this Section 7 shall expire unless such written notice is

delivered to Seller not later than twenty-one (21) days after the October 21, 2018 (the "Due Diligence Completion Date"). If such written notice is not delivered to Seller prior to Due Diligence Completion Date, Buyer shall be deemed to have waived its right to return of the Deposit as set forth in this Section 7.

8. Possession. Seller shall deliver the Premises to Buyer at closing free and clear of all leases, tenancies and occupancies by any person.

9. Prorations; Costs. Real estate taxes and assessments and all utilities shall be prorated as of the closing on the basis of the latest available tax bill. The Maine real estate transfer tax shall be paid by Seller and Buyer. The recording fee for the Deed and any expenses relating to Buyer's financing will be paid for by Buyer.

10. Conditions Precedent. Buyer's obligation to close hereunder is subject to Buyer's full and complete satisfaction with all of the following:

(a) Buyer shall have received binding written commitments on terms satisfactory to Buyer in its sole discretion from lenders and/or investors committing to finance Buyer's acquisition of the Premises. Buyer agrees to exercise diligent efforts to secure such approvals.

(b) Buyer shall have timely completed its due diligence on the Premises, satisfactory to the Buyer in its sole discretion, such due diligence to include an appraisal the results of which are satisfactory to Buyer in its sole discretion;

(c) There shall have been no material adverse change in the condition of the Premises or the Personal Property occurring after the conclusion of Buyer's inspections under Section 7 above, and the Premises and the Personal Property shall be substantially in the same condition at the Closing Date as they were at the time of the inspections, reasonable wear and tear excepted;

(d) Approval from local codes and/or planning for planned improvements

(e) Title to the Premises and the Personal Property shall be good and marketable, and the same shall be conveyed to Buyer free and clear of all liens, claims and encumbrances; and

(f) As of the date hereof, and as of the date of closing, all of Seller's representations and warranties shall be true and correct in all material respects;

If the conditions described in subsections (a) through (e) above are not satisfied as of the dates specified, or if no date is specified, by the Closing Date, then Buyer shall have the option of terminating this Agreement in writing, and the Deposit shall be handled in accordance with Section 11 below.

11. Status of the Deposit. If after the Due Diligence Completion Date Buyer has not terminated this Agreement as provided herein, the Deposit shall become nonrefundable, except (i) in the event of a material adverse change in the physical condition of the Premises that is in

no way due to the fault of Buyer, (ii) if Seller defaults under this Agreement (iii) if Seller is unable to deliver title to the Premises as required in Paragraph 3 above.

12. Default and Remedies. In the event that Buyer defaults under this Agreement, Seller shall retain the Deposit as full and complete liquidated damages in lieu of any other legal or equitable remedy, whereupon this Agreement will terminate and neither party will be under any further obligation hereunder. In the event of Seller's default hereunder, Buyer's exclusive remedy shall be either to terminate the agreement (and receive back the Deposit) or to pursue such rights as it may have to seek an order of specific performance for conveyance of the Premises in their then-current condition.

13. Assignment. Upon written notice to Seller, Buyer may assign this Agreement and all its rights and obligations hereunder to an affiliate of Buyer's.

14. Brokers : The parties represent to each other that neither has had any dealings with any real estate broker in connection with this transaction. Each party agrees to indemnify the other from and against the claims of any other brokers arising from this transaction, which indemnity shall survive the closing and shall include reasonable costs of collection, including reasonable attorneys' fees.

15. Further Assurances. Each party agrees to execute and deliver such corrections to any documents signed at closing, or further documents, as may be reasonably requested by either party after the Closing Date, in order to more fully complete the transactions described in this Agreement.

16. Miscellaneous. Time is of the essence under this Agreement. All notices, demands and other communications hereunder shall be in writing and shall be deemed to have been duly given on the date of service if served personally on the party to whom notice is to be given, or on the first business day after mailing if mailed to the party to whom notice is to be given by first class mail, postage prepaid, certified, return receipt requested, addressed to the recipient at the addresses set forth at the beginning of this Agreement. Either party may change addresses for purposes of this paragraph by giving the other party notice of the new address in the manner described herein. The parties' respective representations, warranties and indemnities shall survive the closing. This Agreement will inure to the benefit of and bind the respective successors and assigns of Seller and Buyer. This Agreement may be simultaneously executed in any number of counterparts, each of which when so executed and delivered shall be deemed an original, but all of which together shall constitute one and the same instrument. If any provision of this Agreement is determined to be invalid or unenforceable, it shall not affect the validity or enforcement of the remaining provisions hereof. Seller acknowledges receipt of the letter attached hereto as Exhibit A, which provides notice that Buyer's acquisition is in part being funded through the Community Development Block Grant program.

IN WITNESS WHEREOF, Seller and Buyer have executed this Agreement as of the date written above.

WITNESS:



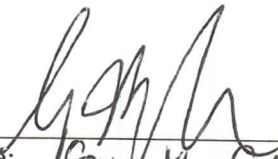
Seller

By: Stephen Ryan
Name:
Its:

Seller

By: _____
Name:
Its:

BIDDEFORD HOUSING AUTHORITY,
Buyer

By: 
Name: Guy M. Gagnon
Title: Executive Director

WARRANTY DEED
Maine Statutory Short Form

098588

KNOW ALL BY THESE PRESENTS, that we, **STEPHEN J. RYAN and JAMES C. BISHOP**, with a mailing address of P.O. Box 35, Bar Mills, Maine, for consideration paid, **GRANT** to **HOUSING OPTIONS, LLC**, a Maine limited liability company, with a principal place of business located in Bar Mills, Maine with **WARRANTY COVENANTS**, the following described premises in the City of Biddeford, County of York, and State of Maine, described as follows:

SEE SCHEDULE A ATTACHED HERETO AND MADE A PART HEREOF.

WITNESS our hands and seals this 14 day of November, 2003.

**SIGNED, SEALED AND DELIVERED
IN THE PRESENCE OF**

Witness

Witness

Stephen J. Ryan

James C. Bishop

STATE OF MAINE
COUNTY OF CUMBERLAND

November 14th, 2003

Then personally appeared the above-named Stephen J. Ryan and James C. Bishop and acknowledged the foregoing instrument to be their free act and deed.

Before me,

~~Notary Public~~ Attorney-at-Law

Print name: Robert M. Raftice Jr.

Robert M Raftice Jr

NO R.E. TRANSFER TAX PAID

SCHEDULE A

A certain lot or parcel of land with all the buildings thereon, situated on the Easterly side of Green Street in said Biddeford, bounded and described as follows:

Beginning on said side of said Street at the Southwesterly corner of land formerly owned by Thomas H. Cole; thence Easterly by said Cole land and by land formerly owned by Jere Simpson to land formerly owned by Edward F. Dow; thence Southerly by said Dow land to land of Eliza Knox and sister; thence Westerly by said Knox land and by land of owner unknown to said Green Street; thence Northerly by said Green Street to the point of beginning, said lot measuring eight and one-fourth (8 1/4) rods on its side lines, more or less, and four and one-half (4 1/2) rods, more or less, on its front and rear lines.

Being the same premises conveyed by deed of Ronald G. Berube and Marie R. Berube to Stephen Ryan and James Bishop, dated February 4, 1998 and recorded in the York County Registry of Deeds in Book 8625, Page 215.

RECEIVED YORK S S.

2003 DEC 22 AM 9: 29

2789
A 4 T

SELLER'S PROPERTY DISCLOSURE

Under Maine Law, certain information must be made available to buyers prior to or during preparation of an offer. This statement has been prepared to assist prospective buyers in evaluating this property. This disclosure is not a warranty of the condition of the property and is not part of any contract between the Seller and any Buyer. The Seller authorizes the Listing Broker in this transaction to disclose the information in this statement to other real estate licensees and to prospective buyers of this property. The Seller agrees to notify the Listing Broker promptly of any changes in the information and this form will be appropriately changed with an amendment date. Inspections are highly recommended.

NOTE: DO NOT LEAVE ANY QUESTIONS BLANK. WRITE N/A (NOT APPLICABLE) OR UNKNOWN IF NEEDED.

PROPERTY LOCATED AT: 25 Green ST., Biddeford, ME 04005

SECTION I. WATER SUPPLY

TYPE OF SYSTEM: ☒ Public ☐ Private ☐ Seasonal ☐ Unknown
☐ Drilled ☐ Dug ☐ Other

MALFUNCTIONS: Are you aware of or have you experienced any malfunctions with the (public/private/other) water system?

Pump: ☐ Yes ☒ No ☐ N/A

Quantity: ☐ Yes ☒ No ☐ Unknown

Quality: ☐ Yes ☒ No ☐ Unknown

If YES to any question, please explain in the comment section below or with attachment.

WATER TEST: Have you had the water tested? ☐ Yes ☒ No

IF YES: Date of most recent test: Are test results available? ☐ Yes ☐ No

To your knowledge, have any test results ever been reported as unsatisfactory or satisfactory with notation? ☐ Yes ☐ No

IF YES, are test results available? ☐ Yes ☐ No

What steps were taken to remedy the problem?

• IF PRIVATE:

INSTALLATION: Location:

Installed BY:

DATE of Installation:

USE: Number of Persons currently using system?

Does system supply water for more than one household?

☐ Yes ☐ No ☐ Unknown

COMMENTS: 12 UNIT Building on site build in 2015 No water usage since then

Source of SECTION I information:

SECTION II. WASTE WATER DISPOSAL

TYPE OF SYSTEM: ☒ Public ☐ Private ☐ Quasi-Public ☐ Unknown

• IF PUBLIC OR QUASI-PUBLIC:

Have you had the sewer line inspected? ☐ Yes ☒ No If yes, what results:

Have you experienced any problems such as line or other malfunctions? ☐ Yes ☒ No

What steps were taken to remedy the problem?

• IF PRIVATE:

TANK: ☐ Septic Tank ☐ Holding Tank ☐ Cesspool ☐ Other:

Tank Size: ☐ 500 Gal. ☐ 1000 Gal. ☐ Unknown ☐ Other:

Tank Type: ☐ Concrete ☐ Metal ☐ Unknown ☐ Other:

Location: OR ☐ Unknown Date of Installation:

Date Last Pumped: Name of Company Pumping Tank:

Have you experienced any malfunctions? ☐ Yes ☐ No

If yes, give the date and describe the problem:

Date of Last Servicing of tank: Name of Company Servicing Tank:

LEACH FIELD: ☐ Yes ☐ No ☐ Unknown

IF YES: Location:

Date of installation of leach field: Installed by:

Date of Last Servicing of leach field: Name of Company Servicing leach field:

Have you experienced any malfunctions? ☐ Yes ☐ No

If yes, give the date and describe the problem & what steps were taken to remedy:

Does Seller have records of the septic system design indicating the number of bedrooms the system was designed for? ☐ Yes ☐ No

IF YES, is it available?

Is System located in a Shoreland Zone? ☐ Yes ☐ No ☐ Unknown

Is System located in a Coastal Shoreland Zone? ☐ Yes ☐ No ☐ Unknown

COMMENTS:

Source of SECTION II information:

2016

Page 1 of 3 - SPD

Buyer(s) Initials

Seller(s) Initials

RE/MAX Horizon, 22 Cottage Road South Portland, ME 04106

Brian Linscott

Produced with zipForm® by zipLogix 18070 Fifteen Mile Road, Fraser, Michigan 48026 www.zipLogix.com

Phone: (207) 767-3366

Fax: (207) 767-5738

Forms2

PROPERTY LOCATED AT 25 Green ST., Biddford, ME 04803

SECTION III. HEATING SYSTEM(S)/SOURCE(S)

Heating System(s)/Source(s)	SYSTEM 1	SYSTEM 2	SYSTEM 3	SYSTEM 4
TYPE(S)	NA			
Age of system(s)/source(s)	NA			
Name of company that services system(s)/source(s)	NA			
Date of most recent service call	NA			
Annual consumption per system/ source (i.e., gallons, kilowatt hours, cord(s))	NA			
Malfunction per system(s)/ source(s) within past 2 years	NA			
Other pertinent information	NA			

Is there an oil supply line? ☐ Yes ☒ No ☐ Unknown Is it buried? ☐ Yes ☒ No ☐ Unknown Is it sleeved? ☐ Yes ☐ No ☒ Unknown
Chimney(s): ☐ Yes ☒ No If yes, lined: ☐ Yes ☐ No ☐ Unknown Last cleaned: NA
Is more than one heat source vented through one flue? ☐ Yes ☐ No ☐ Unknown NA Had a chimney fire: ☐ Yes ☐ No ☒ Unknown
Has chimney been inspected? ☐ Yes ☐ No ☐ Unknown; If Yes, when: NA Direct/Power Vent: ☐ Yes ☐ No ☒ Unknown
COMMENTS: 12 unit building burned in 2015 there is no heating system
Source of SECTION III information: _____

SECTION IV. HAZARDOUS MATERIAL

The licensee is disclosing that the Seller is making representations contained herein.

A. UNDERGROUND STORAGE TANKS - Current or previously existing:

Are there now, or have there ever been, any underground storage tanks on your property? ☐ Yes ☐ No ☒ Unknown
IF YES: Are tanks in current use? ☐ Yes ☐ No ☐ Unknown

IF NO above: How long have tank(s) been out of service? _____

What materials are, or were, stored in the tank(s)? _____

Age of tank(s): _____ Size of tank(s): _____

Location: _____

Have you experienced any problems such as leakage? _____

Are tanks registered with the Dept. of Environmental Protection? ☐ Yes ☐ No ☒ Unknown

If tanks are no longer in use, have tanks been abandoned according to D.E.P.? ☐ Yes ☐ No ☒ Unknown

COMMENTS: _____

Source of information: _____

B. ASBESTOS - Current or previously existing:

- as insulation on the heating system pipes or duct work? ☐ Yes ☐ No ☒ Unknown
- in the siding? ☐ Yes ☐ No ☒ Unknown
- in the roofing shingles? ☐ Yes ☐ No ☒ Unknown
- in flooring tiles? ☐ Yes ☐ No ☒ Unknown
- other: _____ ☐ Yes ☐ No ☒ Unknown

Source of information: _____

COMMENTS: _____

C. RADON/AIR - Current or previously existing:

Has the property been tested? ☒ Yes ☐ No ☐ Unknown

IF YES: Date: 3/18/14 By: JAMES Bishop

Results: 1.505 Bq/m³ If applicable, What remedial steps were taken? NONE

Has the property been tested since remedial steps? ☐ Yes ☒ No ☐ Unknown

Are test results available? ☒ Yes ☐ No Results & Comments: _____

Source of information: ALPHA Energy Laboratories

D. RADON/WATER - Current or previously existing:

Has the property been tested? ☐ Yes ☐ No ☒ Unknown

IF YES: Date: _____ By: _____

Results: _____ If applicable, What remedial steps were taken? _____

Has the property been tested since remedial steps? ☐ Yes ☐ No ☒ Unknown

Are test results available? ☐ Yes ☐ No Results & Comments: _____

Source of information: _____

E. LEAD-BASED PAINT/PAINT HAZARDS - Current or previously existing: (Note: Lead-based paint is most commonly found in homes constructed prior to 1978)

Is there now or has there ever been lead-based paint and/or lead-based paint hazards on the property? ☐ Yes ☐ No ☐ Unknown

IF YES, describe location and the basis for the determination: ☒ Unknown but possible due to age

Do you know of any records or reports pertaining to such lead-based paint or lead-based paint hazards: ☐ Yes ☒ No

IF YES, describe: _____

Are you aware of any cracking, peeling or flaking paint? ☐ Yes ☒ No

COMMENTS: Building burned in 2015 this is a lot with a shed only

Source of information: _____

PROPERTY LOCATED AT 25 Green ST., Biddeford, ME 04005

F. OTHER HAZARDOUS MATERIALS - Current or previously existing:

TOXIC MATERIAL: ☐ Yes ☐ No ☒ Unknown
LAND FILL: ☐ Yes ☐ No ☒ Unknown
RADIOACTIVE MATERIAL: ☐ Yes ☐ No ☒ Unknown

OTHER: _____

Source of information: _____

Buyers are encouraged to seek information from professionals regarding any specific issue or concern.

SECTION V. GENERAL INFORMATION

Is the property subject to or have the benefit of any encroachments, easements, rights-of-way, leases, rights of first refusal, life estates, private way, private road/homeowner associations (including condominiums and PUD's) or restrictive covenants? ☐ Yes ☐ No ☒ Unknown

IF YES: Explain: _____

What is your source of information: _____

Are there any tax exemption or reduction for this property for any reason including but not limited to: Tree Growth, Open Space and Farmland, Veteran's, Homestead Exemption, Blind, Working Waterfront? ☐ Yes ☐ No ☒ Unknown

IF YES: Explain: _____ Forest Management and Harvest Plan available? ☐ Yes ☒ No ☐ Unknown NA

• Is this house currently covered by a flood insurance policy? ☐ Yes ☐ No ☐ Unknown NA

• Equipment leased or not owned (e.g., propane tank, hot water heater, satellite dish): Type: NA

• Year Principal Structure Built: NA What year did Seller acquire property? 1998 - converted

• Roof: Year Shingles/Other Installed: NA Tolled in 2003

Water, moisture or leakage: NA

Comments: NA

• Foundation/Basement: Sump Pump: ☐ Yes ☒ No ☐ Unknown Comments: _____

Water, moisture or leakage since you owned the property: ☐ Yes ☒ No ☐ Unknown Comments: _____

Prior water, moisture or leakage? ☐ Yes ☒ No ☐ Unknown Comments: _____

• Mold: Has the property ever been tested for mold? ☐ Yes ☒ No ☐ Unknown If YES, are test results available? ☐ Yes ☐ No

• Electrical: ☐ Fuses ☐ Circuit Breaker ☐ Other: None NA ☐ Unknown

• Has all or a portion of the property been surveyed? ☐ Yes ☐ No ☒ Unknown If YES, is the survey available? ☐ Yes ☐ No

• Manufactured Housing: Mobile Home - ☐ Yes ☐ No ☐ Unknown NA Modular - ☐ Yes ☐ No ☐ Unknown NA

• KNOWN MATERIAL DEFECTS about Physical Condition and/or value of Property, including those that may have an adverse impact on health/safety: NA

Source of SECTION V information: _____

Seller shall be responsible and liable for any failure to provide known information regarding known material defects to the Buyer.

ATTACHMENTS EXPLAINING CURRENT PROBLEMS, PAST REPAIRS OR ADDITIONAL INFORMATION IN ANY SECTION IN DISCLOSURE: ☐ Yes ☐ No NA

SECTION VI. ADDITIONAL INFORMATION

This property is a vacant lot with the remains of a granite/stone foundation. There is a small shed on the property - the rest of the lot is paved.

As Sellers, we have provided the above information and represent that all information is correct. To the best of our knowledge, all systems and equipment, unless otherwise noted on this form, are in operational condition.

Neither Seller nor any Broker makes any representations as to the applicability of, or compliance with, any codes of any sort, whether state, municipal, federal or any other, including but not limited to fire, life safety, building, electrical or plumbing.

[Signature]
SELLER

8/30/18
DATE

[Signature]
SELLER

8/30/18
DATE

I/We have read and received a copy of this disclosure, the arsenic in wood fact sheet, the arsenic in water brochure, and understand that I/we should seek information from qualified professionals if I/we have questions or concerns.

[Signature]
BUYER

8/30/18
DATE

BUYER

DATE



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Forms2

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PAUL P. GADBOIS PE, PLS

Civil Engineering, Surveying, Land Planning
Structural Engineering, DEP Permitting

P.O. Box 327
Saco, ME 04072
Phone & Fax (207) 283-3980
Email: pgadbois53@gmail.com

January 16, 2019

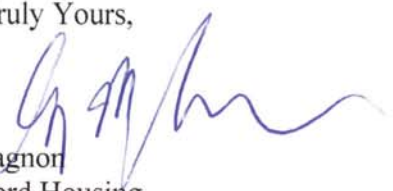
Paul P. Gadbois, P.E., P.L.S.
Paul P. Gadbois Engineering
P.O. Box 327
Saco, Maine 04072

RE: Biddeford Housing 25 Green Street.

Dear Paul,

This letter will serve as authorization for Paul P. Gadbois Engineering to act as agent on the above referenced project with regards to various land use permitting requirements for the property (Tax Map 38, Lot 263) located at 25 Green Street in Biddeford.

Very Truly Yours,


Guy Gagnon
Biddeford Housing

BIDDEFORD HOUSING AUTHORITY

P.O. BOX 2287/Biddeford, Maine 04005
(207) 282-6537 Fax (207) 286-0580



Narrative:

The 25 Green Street project is the redevelopment of a vacant in-town lot which once housed a ten-unit apartment building that tragically burned down a few years ago, luckily no one was injured. The five units proposed are conforming to the current zoning in all aspects including density and set back requirements. Because the project is considered a “minor development” under Biddeford’s ordinances, a staff review, and approval is all that is required, thus the turnaround will be very quick and not delay construction. If approved for funding we would be prepared to begin construction immediately once all the predevelopment planning and documentation is completed. Another advantage to modular is that the building pieces can be constructed during the cold months at the plant and be ready for transport any time we request with only about 6 weeks lead time.

We have had the site reviewed by our engineer and also a local site contractor who has provided us with an estimate for the foundation, utility connections and site work. There are no known environmental concerns or issues that will inhibit the construction of the building planned. It should also be noted that this location has received a very high walkability score due to very close proximity to grocery stores, food pantries, library, government buildings, post office, public parks, etc...

Modular construction: Our proposal is to use a modular construction method from one of the highest quality modular builders in the region. Not only is the quality excellent, but it will reduce construction time considerably. It will also avoid many of the unknowns and unpredictability of ground-up construction from both a cost and scheduling standpoint. A summary of the specifications for their structures as well as info on the modular company and US. Manufacturing rep are included. I personally have worked with Pro-fab homes in the past and found them to be extremely good partners and equally as concerned about the quality of housing they deliver. Changes can be made if needed to address any Maine Housing construction standards.

Community Space: A small area of community space is proposed which will serve the resident’s needs including laundry facility. Another aspect of the project is the inclusion of services to be provided by York County Community Action, which are described in the attachments and are included in our expense portion of the operating budget. The goal of those services will be to assist these families with all aspects of their lives that need support in order for them to get gain stability and flourish.

Consolidated Plan Priorities: Housing stability is the primary need being met for these families. The Housing First model is more than just a slogan, it is reality, because without stable housing, nothing else really matters.



Also, the stresses in the rental market are forcing rent prices up dramatically, reducing the ability for lower income families to find decent, quality housing. These 5 units will continue on with the mission of Biddeford Housing to create affordable, quality housing for all demographics.

Funding Request: As stated in the pro forma attached, we are seeking \$897,959, which breaks down to \$179,592 per unit. This amount is able to be lower than average because of our lower than market land acquisition price, our strong local subcontractor relationships and using the predicable modular construction approach. BHA is also willing to contribute toward the construction financially if needed and will fund any shortfall if one occurs.

Does the applicant, any principal or affiliate of the applicant, or anyone who will be paid for work on the project have business ties, family relationships, or other close personal relationships with a current Maine Housing employee or commissioner or anyone who was a Maine Housing employee or commissioner within the past year?: No

Accessibility: We are providing 1 fully accessible unit which is 20% of the total of 5 units. In addition, the entire community space and laundry areas would be fully accessible. We can also make adjustment to the plan to add more adaptable units if needed.

Local Support: Biddeford Housing has been part of a regular planning group which included the city planning director, the Director of Seeds of Hope, a neighborhood drop in center for homeless and others, the Mayor of Biddeford, representatives from York County Community action, the director of the local public library, Stone Soup food pantry, etc... Then group has divided into sub committees in order to address homeless issues from all angles. Biddeford Housing is and will continue to be part of this group as well as others looking to solve homeless problems in Biddeford-Saco region. The experience of the group and from inquiries received at BHA every day it is clear that there are numerous homeless families in our region. Families of all sizes are in need. This application hopes to allow for those with children to find a home. We will work with Maine Housing's wait list as well as our own local inquiry list and applicants to the city's general assistance department in order to find the best occupants.

Over the past eight years, Biddeford Housing has taken a more aggressive approach to solving the affordable housing issues in our region. Without the assistance of Maine Housing, our efforts would have had much less of an impact. The two small 4-unit supportive housing projects funded by MH have been a blessing to our community and 5 more units will allow us to say yes to a few more of the calls we get daily from service providers and their clients in desperate need of shelter. For a community the size of Biddeford, even if this project moves forward, we are not nearly meeting the needs of our lowest income residents but at least we would be getting closer.

BIDDEFORD HOUSING AUTHORITY

P.O. Box 2287, 22 South St., Biddeford, Maine 04005 Tel. (207) 282-6537 Fax. (207) 286-0580

January 8, 2019

Biddeford Historic Preservation Commission
City Hall
Biddeford, Me. 04005

Re: 25 Green Street, **Biddeford**

Biddeford Housing is proposing to construct a new 3-story/5-unit building, at 25 Green Street. Some may remember a fire destroyed the previous 12-unit structure there a few years ago. Our project is being financed through Maine State Housing. We feel our proposed building will enhance the neighborhood and help the city in the redevelopment of the central core of Biddeford.

We intend to construct the building in a manner consistent with the features found on other structures in the neighborhood. We will use a high-quality vinyl siding for the body of the building and trim details around the windows, doors and building corners to match details that would have existed in the past. Our plan will result in a very authentic look for the building once completed. Windows are designed with the classic Colonial grid pattern of 8 or 6 over 1.

Appropriate landscaping will be installed around the perimeter of the lot including a significant green area in front which will help soften the feel of this portion of Green Street.

In addition to preliminary plans and some siding details, we have attached current photos of the buildings in the adjacent area plus photos of the existing site conditions. We would welcome any suggestions on design from the commission members.

Thank you and don't hesitate to call if you need further documentation.

Sincerely,



Guy M. Gagnon
Executive Director

BIDDEFORD HOUSING AUTHORITY

P.O. Box 2287, 22 South St., Biddeford, Maine 04005 Tel. (207) 282-6537 Fax. (207) 286-0580

January 12, 2019

Biddeford Planning Department
City Hall
Biddeford, Me. 04005

Re: 25 Green Street, **Biddeford**

Biddeford Housing is proposing to construct a new 3-story/5-unit building, at 25 Green Street. Some may remember a fire destroyed the previous 12-unit structure there a few years ago. Our project, which is being financed through Maine State Housing, will undoubtedly enhance the neighborhood and help the city in the continued redevelopment of the central core of Biddeford.

Because of the population demographic being served and based on our development of other similar properties in the past, we feel confident that the 6 on-site parking spaces included in our design are more than adequate. Therefore, we would respectfully request a waiver from the 10 space requirement.

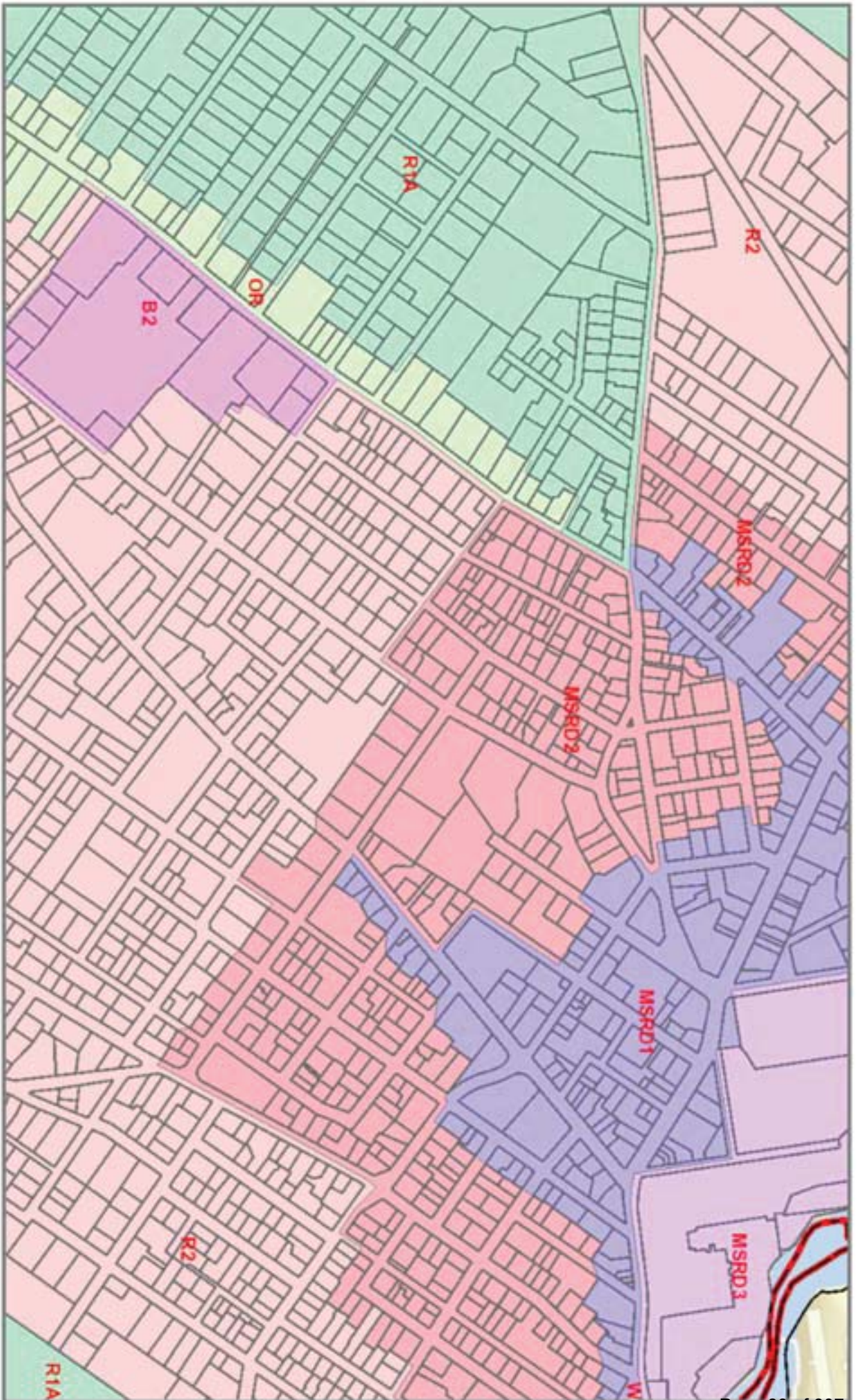
A secondary benefit of this waiver will be to allow for more landscaping around the perimeter of the lot including a significant green area in front which will help soften the feel of this portion of Green Street.

Thank you and don't hesitate to call if you need further documentation.

Sincerely,



Guy M. Gagnon
Executive Director



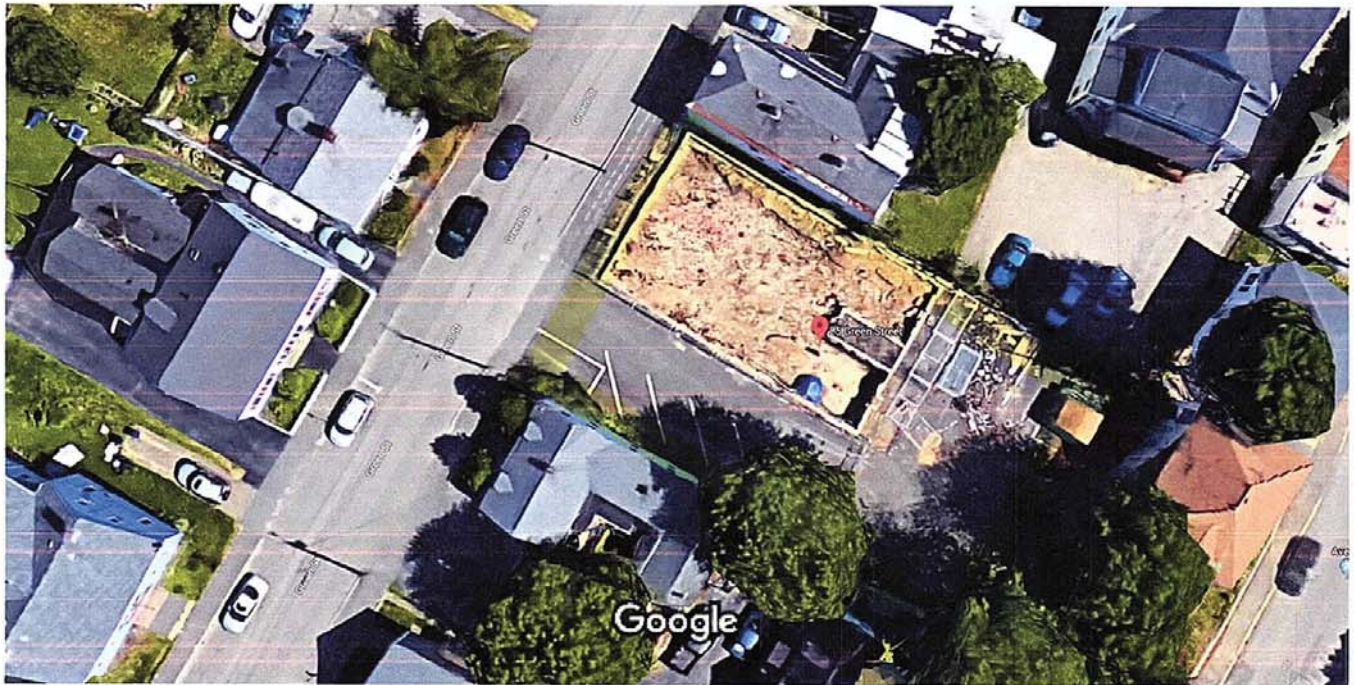
Property Map

1 inch = 591 feet



Data and scale shown on this map are provided for planning and informational purposes only. BIDDEFORD (ME) and Vision Government Solutions are not responsible for any use for other purposes or misuse or misrepresentation of this information.

1/16/2019



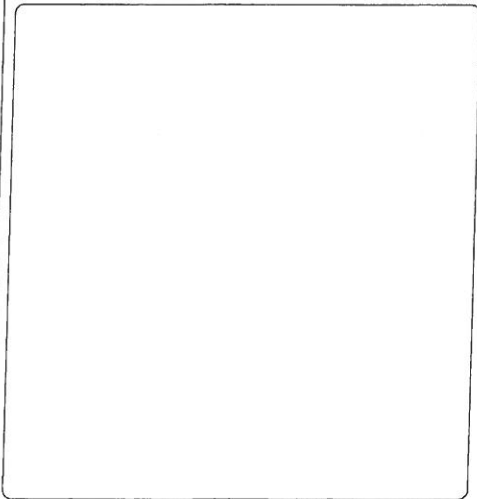
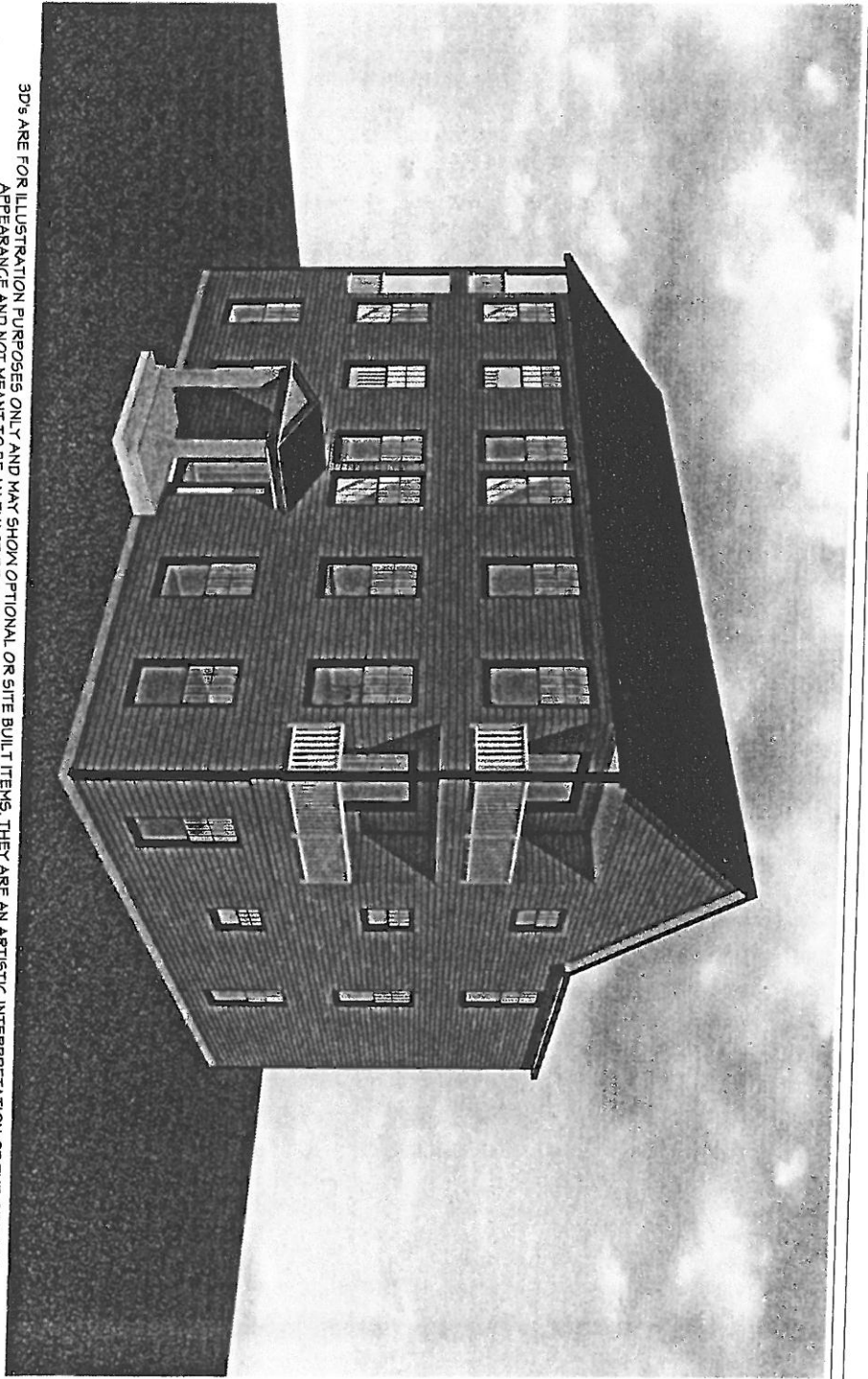
Imagery ©2018 Google, Map data ©2018 Google 20 ft



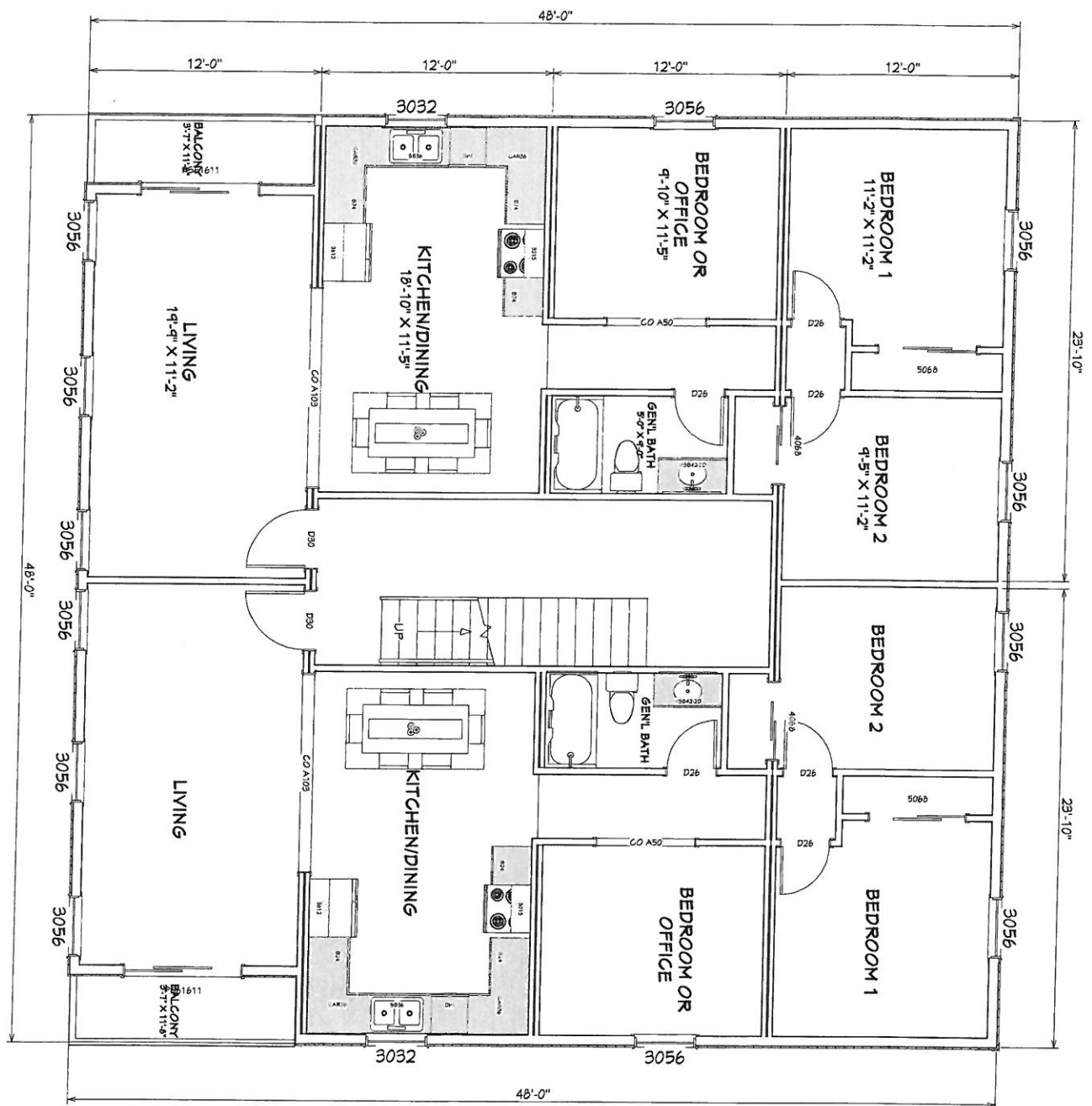
25 Green St
Biddeford, ME 04005



3D's ARE FOR ILLUSTRATION PURPOSES ONLY AND MAY SHOW OPTIONAL OR SITE BUILT ITEMS. THEY ARE AN ARTISTIC INTERPRETATION OF THE GENERAL APPEARANCE AND NOT MEANT TO BE AN EXACT RENDITION. PLEASE REFER TO BUILDER CONTRACTS FOR PRODUCTS INCLUDED.



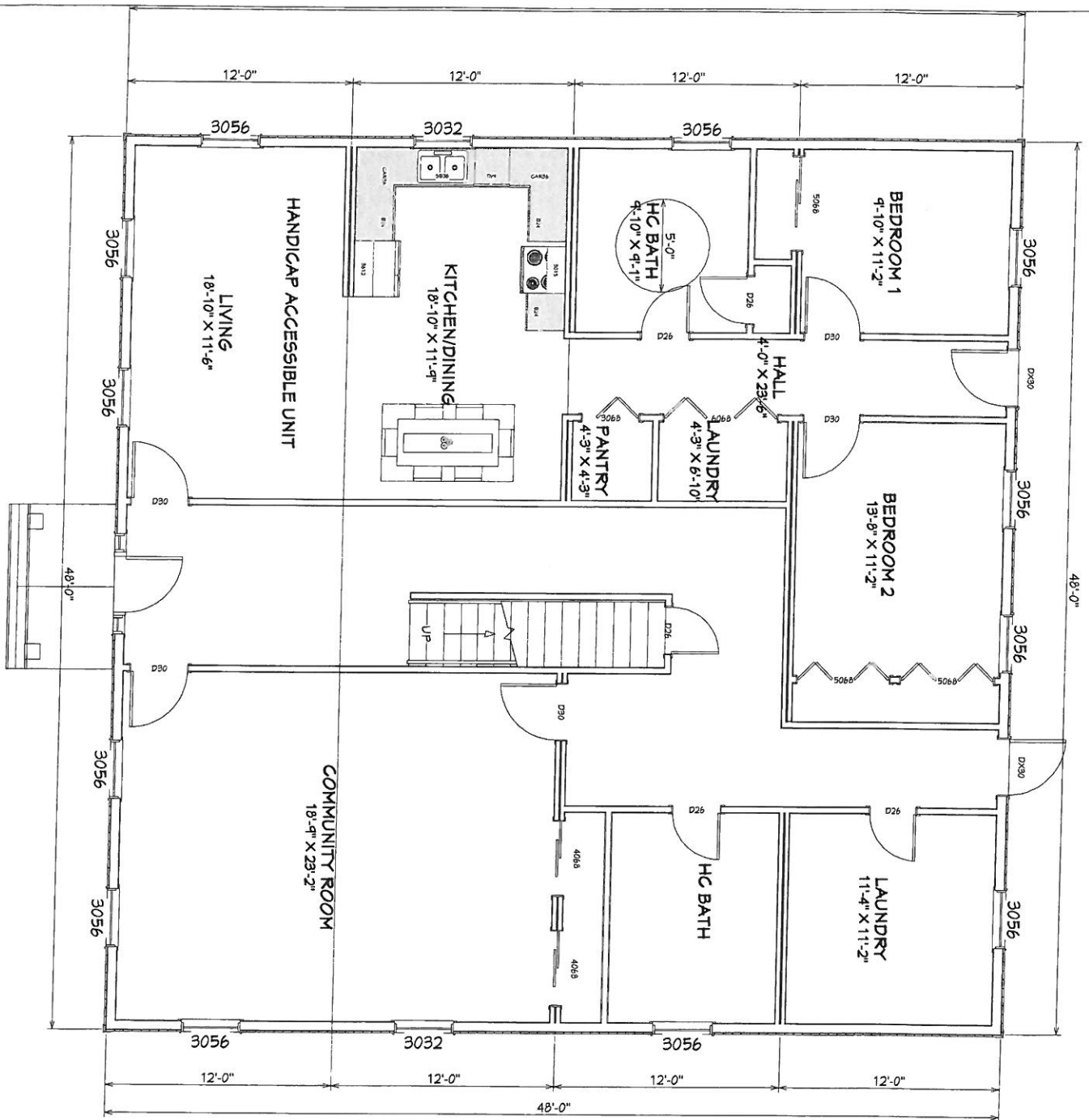
USE GROUP R3	BUILDER BUILDER	HOME OWNER CUSTOMER	SERIAL No	PE/RA	THIRD PARTY INSPECTION AGENCY
CONST TYPE WOOD FRAME (VB)		SITE ADDRESS	PRODUCTION No		
DESIGNER DWW	CUSTOM 2 STORY		REVISION	DATE	
DATE 12/19/2018			6	12/2/15	
SCALE AS NOTED					
PAGE 1					



SCALE: 1/4" = 1'0"

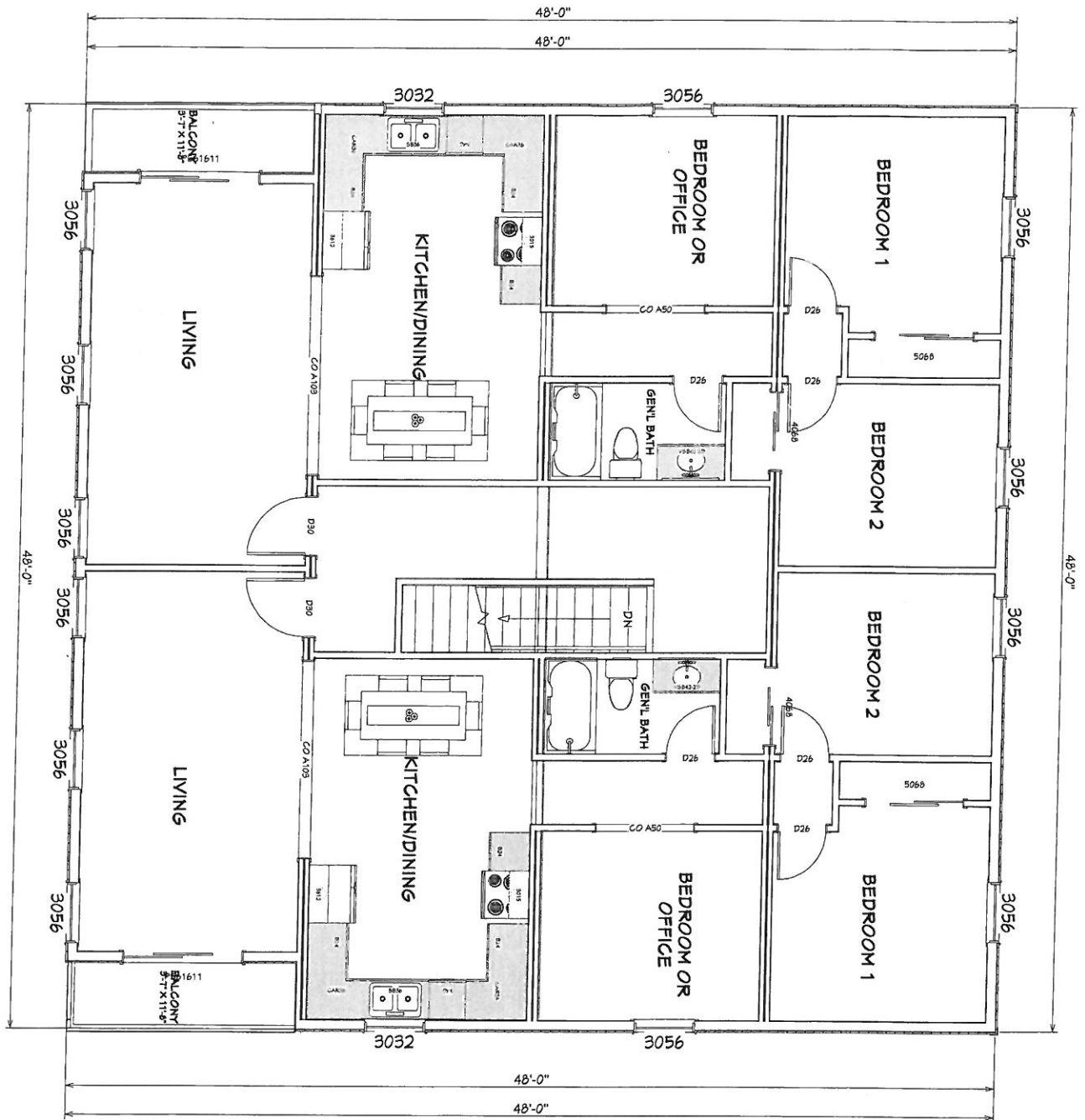
USE GROUP R3	BUILDER BUILDER	HOME OWNER CUSTOMER	SERIAL No	PE/RA	THIRD PARTY INSPECTION AGENCY
CONST TYPE WOOD FRAME (VB)		SITE ADDRESS	PRODUCTION No		
DESIGNER DWW			REVISION	DATE	
DATE 12/19/2018			6	12/2/15	
SCALE AS NOTED					
PAGE 5					

**CUSTOM 2 STORY
SECOND FLOOR**



SCALE: 1/4" = 1'-0"

USE GROUP R3	BUILDER	HOME OWNER	SERIAL No	PE/RA	THIRD PARTY INSPECTION AGENCY
CONST TYPE WOOD FRAME (VB)	BUILDER	CUSTOMER	PRODUCTION No		
DESIGNER DWW		SITE ADDRESS	REVISION	DATE	
DATE 12/19/2018			6	12/2/15	
SCALE AS NOTED					
PAGE 4	CUSTOM 2 STORY FIRST FLOOR				





LEGEND

- ▲ SURVEYORS TRAVERSE POINT
- FOUND IRON ROD OR PIPE
- PROPERTY LINE
- ADJUTERS PROPERTY LINE
- SETBACK LINE
- N/F NON OR FORMERLY
- UTILITY POLE
- OVERHEAD UTILITIES
- EXISTING FIRE HYDRANT
- SEWER MANHOLE
- DRAIN MANHOLE
- CATCH BASIN
- ▽ WATER SHUTOFF



THIS SURVEY CONFORMS TO THE MAINE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS, RULES OF APRIL 2001, CHAPTER 80, STANDARDS OF PRACTICE.

Paul P. Gadbois
PAUL P. GADBOIS, PLS 2104 DATE 01-15-19



YORK, ss. REGISTRY OF DEEDS
Received _____ of _____
Attest: _____
Register

APPROVAL
CITY OF BIDDEFORD
PLANNING BOARD

LOT COVERAGE	
EXISTING	PROPOSED
3,280 SF	7,284 SF
6,278 SF	4,100 SF
TOTAL	9,423 SF

ZONE REQUIREMENTS: MSB02
MIN. LOT SETBACK FRONTAGE 2,000 SF PER UNIT
MIN. SETBACK FRONTAGE 15 FEET
MIN. FRONT YARD 15 FEET
MIN. SIDE AND REAR YARD 35 FEET
MAX. HEIGHT 35 FEET

LOCUS DEED REFERENCE:

- WARRANTY DEED STEPHEN J. VAN AND JAMES C. BRING TO THE RECORD THE FOLLOWING DEEDS: DEED NO. 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 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CITY OF BIDDEFORD

PLANNING DEPARTMENT

Greg D. Tansley, A.I.C.P.
205 Main Street
PO Box 586
Biddeford, ME 04005
(207) 284-9115

Greg.Tansley@Biddefordmaine.org

NOTICE OF DECISION

March 11, 2019

Guy Gagnon, Executive Director (via e-mail: ggagnonbha@maine.rr.com)
Biddeford Housing Authority
22 South Street
Biddeford, ME 04005

RE: 2019.08 Preliminary and Final Site Plan and Subdivision Plan Review for Biddeford Housing Authority to construct a three story, five unit residential building on a vacant lot located on 25 Green Street (Tax Map 38, Lot 263) in the MSRD-2 zone.

Dear Guy,

At their meeting of February 6, 2019, the Biddeford Planning Board reviewed the Preliminary and Final Subdivision/Site Plan for Biddeford Housing Authority to create a 5-Unit Multi-family building at 25 Green Street (Tax Map 38, Lot 263) in the MSRD-2 Zone. Housing Options, LLC owns the property and you presented the application proposal to the Planning Board.

Based on the presentation and the materials submitted, the Planning Board waived the requirement for ten (10) parking off-street parking spaces allowing only five (5) off-street (on-site) parking spaces. The Planning Board then granted the site plan and subdivision approval, agreed to sign the plans, and approved the findings of fact conditioned on the following:

1. **Prior to any ground disturbance or issuance of any permits:**
 - a. A pre-construction meeting with the contractor needs to be held with the Engineering Department to discuss inspection requirements.
 - b. An Erosion and Sedimentation Control Performance Guarantee (acceptable to the Planning Department) in an amount to be determined by the Planning Department shall be submitted to the Planning Department.
 - c. Stabilized Construction Access shall be constructed to the satisfaction of the Engineering Department.
2. **Prior to the issuance of any occupancy permits:**
 - a. The applicant must submit a recorded copy of the Notice of Decision for the subdivision/site plan approval to the Planning Office.
 - b. A sewer permit is required prior to any permit issuance. Sewer impact fee will be assessed once final flow numbers are provided to the Director.

- c. A Performance Guarantee acceptable to the Planning Department shall be submitted in an amount of 150% of all remaining site improvements.
3. If any roof drains are connected to the sewer system they must be disconnected as part of this approval.
4. A sewer permit is required prior to any permit issuance. Sewer impact fee will be assessed once final flow numbers are provided to the Director.
5. No trash is permitted to be placed at the curb for City pickup. Trash pickup and disposal, for all units associated with this approval or previous approvals, is the responsibility of the applicant.
6. Standard Conditions of Approval apply.

The Planning Board Site Plan Review approval shall be valid for one (1) year from the date of said approval. If a building permit has not been issued within one (1) year, then said approval shall become automatically null and void.

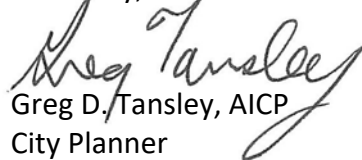
The final approval of the subdivision plan shall be valid for a period of two years. If within that time period, proposed infrastructure improvements, such as roadways, sewer or and water lines, are not completed in such a manner as to serve, or service, 75 percent of the lots/units approved, approval for lots not served or serviced, by the existing in-place improvements shall be voided and no permits shall be issued for such lots not serviced.

Appeals of the Planning Board's decision may be made as per the Biddeford Revised Code of Ordinances.

Please contact us at 284-9115 if you have any questions.

FOR THE BIDDEFORD PLANNING BOARD

Sincerely,


Greg D. Tansley, AICP
City Planner

Cc: J. Malloy P.E., Staff Engineer (via e-mail)
R. Fecteau, Code Enforcement Officer (via e-mail)
M. Eddy, Economic Development (via e-mail)
File



CITY OF BIDDEFORD

PLANNING DEPARTMENT

Greg D. Tansley, A.I.C.P.
205 Main Street
PO Box 586
Biddeford, ME 04005
(207) 284-9115

Greg.Tansley@Biddefordmaine.org

Standard Conditions of Approval

Owner/Applicant: Guy Gagnon, Executive Director (via e-mail:
ggagnonbha@maine.rr.com)
Biddeford Housing Authority
22 South Street
Biddeford, ME 04005

Project Description: New 5-Unit Multi-family Structure

Project Location: 25 Green Street

Tax Map / Lot Number: Tax Map 38, Lot 263

Project ID: 2019.08

1. The material provided for the proposed project has been reviewed only for general conformance to the City technical requirements. The applicant(s) and/or their technical consultant shall be responsible for the actual design details and completeness of their work. It is incumbent upon the applicant(s) to ensure that the project is in conformance and complies with all City Codes, ordinances and regulations as well as with all state regulations, including, but not limited to, space and bulk standards, performance standards, use standards and other zoning type requirements.
2. All work shall be in conformance with the approved plans and submission documents. No deviations from the approved plans are permitted without prior approval from the Planning Board for major changes, and from the City Planner and City Engineer for minor changes. The City Planner shall make the determination of major or minor.
3. If Site Development is required as part of the project, a Letter of Credit or other surety acceptable to the City of Biddeford shall be submitted prior to the issuance of permits or site work being initiated. The financial guarantee shall be established for 150% of the cost of the remaining project improvements. (Items include but are not limited to the following):
 - a. Landscaping
 - b. Paving

- c. Work within ROW (existing or proposed)
 - d. Drainage
 - e. Loam & seed
 - f. Sediment & erosion control
 - g. As-builts
 - h. Monuments
4. Prior to any ground disturbance, the applicant shall establish a construction inspection account equal to: PAID in Review Fee.
 5. Prior to any ground disturbance, a pre-construction meeting with the owner/applicant, contractor, and City is required. Contact the Engineering Department to schedule this meeting.
 6. Contact the Department of Public Works for driveway location permits, curb cut permits and/or street opening permits prior to the start of construction.
 7. If Site Development is required as part of the project, an as-built plan must be provided to the City of Biddeford Engineering Office at the end of the project on mylar and on a disk, in a format, which can be read by the City of Biddeford's Geographic Information System software. If a disk copy cannot be provided, a charge for staff time to enter the plan into the City system will be assessed to the applicant.
 8. The applicant shall incorporate appropriate erosion control measures into this project to reduce erosion affects from the work. All disturbed areas must be re-vegetated and/or otherwise stabilized at the appropriate stage of the work per Maine DEP standards in the Best Management Practice (BMP) manual.
 9. That the Article VI Performance Standards requirements regarding Dust, Fumes, Vapors & Gases (sect 25), Explosive Materials (sect 28), Glare (sect 37), Noise (sect 48) be followed.
 10. The applicant is required to comply with all applicable requirements of Chapter 70 (Utilities) and Chapter 71 (Utilities/Industrial Pretreatment Program).
 11. The applicant shall obtain all other pertinent local, state and federal permits, licenses, and insurance such as blasting, building, electrical, plumbing, etc prior to commencing business.
 12. If Site Development is required as part of the project, at the completion of the project the owner/applicant shall request a final inspection. This request shall be directed to the Planning Office. Performance Guarantees and remaining escrow accounts shall not be released until the Planning Office certifies that the project has been completed and is in compliance with the approval and all applicable City Ordinances.



United Way
of Southern Maine

June 13, 2024

To: Mr. Scott Welton, Fire & Life Safety Inspector
To: City of Biddeford Planning Board
Re: Letter of Intent to Establish a Childcare Center

Dear Mr. Welton and the City of Biddeford Planning Board,

My name is Rebecca Alfredson, and I am the Director of Education at United Way of Southern Maine. Please accept this letter of support for Christine Biyoga to open a child care center in partnership with the Biddeford Housing Authority at 25 Green St. in Biddeford.

Christine is a participant in United Way of Southern Maine (UWSM) Child Care Incubator program. The Child Care Incubator is a program run in partnership with Coastal Enterprises Inc., the Greater Portland Workforce Initiative, Starting Strong, and UWSM. The goal of this program is to provide an accessible pathway for aspiring entrepreneurs to obtain the necessary training and credentials to become a child care provider. This program is accompanied by intentional support and services to ensure the participants are successful in developing a sustainable business plan that creates access to more affordable child care slots in the community.

It was estimated this spring that less than half of all children aged 0-5 in Biddeford are attending an established child care, and 38% of kindergartners in the 2023-2024 school year were identified with a potential developmental delay during the screening process. We know that adding more high-quality, affordable child care slots will provide Biddeford's youngest learners with the opportunity to thrive as students upon entering school and give their parents the opportunity to reach a place of greater financial stability. Additionally, adding slots will provide a greater opportunity for families to access early intervention services that contribute to kindergarten readiness.

I have had the privilege of working with Christine over the past few months as she has begun her child care training. She is diligent, hard-working, communicative, and hopes to provide a service to the Biddeford community that is urgently needed by families. United Way of Southern ME is excited to have Christine as a Child Care Incubator participant in the coming months and intends to continue to provide, along with the partners above, coaching and support through the program to ensure the launch of her child care business is a success.

Thank you for your consideration and your continued commitment to making Southern Maine a stronger, healthier, better place to live.

All my best,
Rebecca Alfredson
ralfredson@uwsme.org
617-939-1583

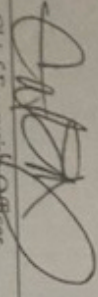
Council for Professional Recognition

CHRISTINE N BIYOGA

has satisfactorily demonstrated competence in working with young children through an assessment by the CDA® National Credentialing Program and is hereby awarded the Child Development Associate® (CDA) Credential™

Infant Toddler




Chief Executive Officer
Council for Professional Recognition

June 26, 2022

Credential Date

June 26, 2025

Expiration Date

C000194182

Credential Number

CONTRACT ZONE # 23 AGREEMENT
INDIAN CLIFF DEVELOPMENT CORPORATION
In Partnership with AVESTA HOUSING
9-Lot Subdivision on Barra Road and Trailside Way (new roadway)
(Tax Map 7, Lot 15)

THIS CONTRACT ZONE AGREEMENT is entered into effective the ____ day of _____, 2024, by and between, Indian Cliff Development Corporation, Mike Eon – President (collectively and together with their successors and assigns, the “Developer”), and the City of Biddeford, a body corporate and politic located in Biddeford, Maine (the “City”).

RECITALS:

WHEREAS, Indian Cliff Development Corporation, is the owner of a certain lot or parcel of land, approximately 55.94-acres in area located at the terminus of Barra Road, more commonly referenced as Tax Map 7, Lot 15. The Developer is seeking to subdivide approximately seven (7) acres, into nine (9) lots, for: the creation of a 46-unit, low/moderate Income (“LMI”) senior housing development; the creation of seven (7) lots for single/two-family homes; and one (1) lot for stormwater detention, pursuant to the City’s Code of Ordinances, Part III Land Use Regulations, Article V, Section 9 (Contract Zones) as illustrated on Exhibit A (Concept Subdivision).

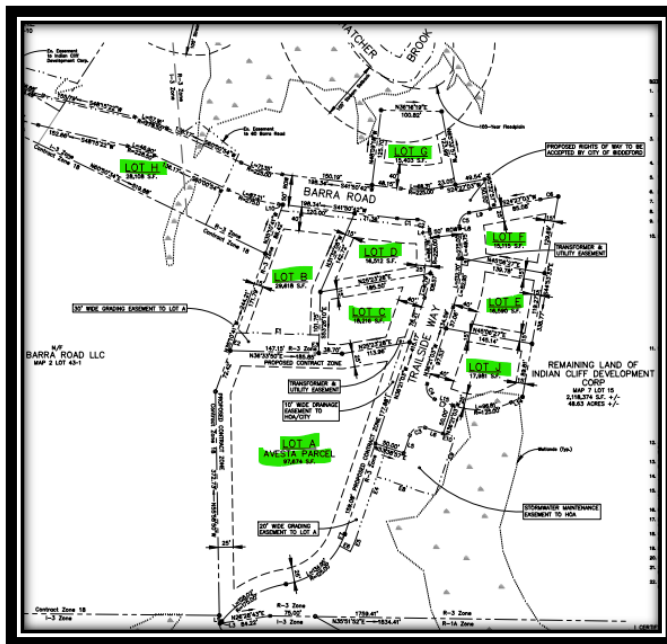


Exhibit A – Concept Subdivision

Total Lot Area: 55.94-acres
Subdivided Parcel: 7-acres
Proposed Lots: 9 lots
Lot A: Avesta Housing
2.2-acres, 46-units.

Lots B through G and Lot J:
Single-family or 2-family (duplex) lots.

Lot H:
Stormwater Management and access easements granted to Reveler (Formerly Saxon) for development of the 60 Barra Road project (Contract Zone #18 - Indian Cliff Development).

WHEREAS, the Developer is seeking to subdivide approximately seven (7) acres, of the 55.94-acres, into nine (9) lots. 4.8-acres for the development of eight (8) residential zoning lots for single or two-family homes, and one lot exclusively for stormwater detention. The remaining 2.2-acres would be purchased and developed by Avesta Housing.

WHEREAS, Avesta Housing is under contract with the Developer to acquire 2.2-acres of the subdivided Property in order to develop it as a four (4) story 46-unit LMI senior housing development (the “Project”);

WHEREAS, The Avesta Housing project is in keeping with the properties previously approved Joint Development Agreement (JDA) / Contract Zone which stipulated that Indian Cliff Development would provide a LMI senior housing in this general area which is required to have a *minimum* of 30 units. The Avesta Development project for a 46-unit senior, low to moderate income (LMI) housing units would meet the Developer’s contractual obligation.

WHEREAS, in order to facilitate the Project, the Developer requires certain changes to the requirements of the City Code of Ordinances that would be applicable to the Project;

WHEREAS, the City and the Developer have agreed to rezone the Property to allow for the construction of the Project subject to the conditions and restrictions set forth in this Agreement;

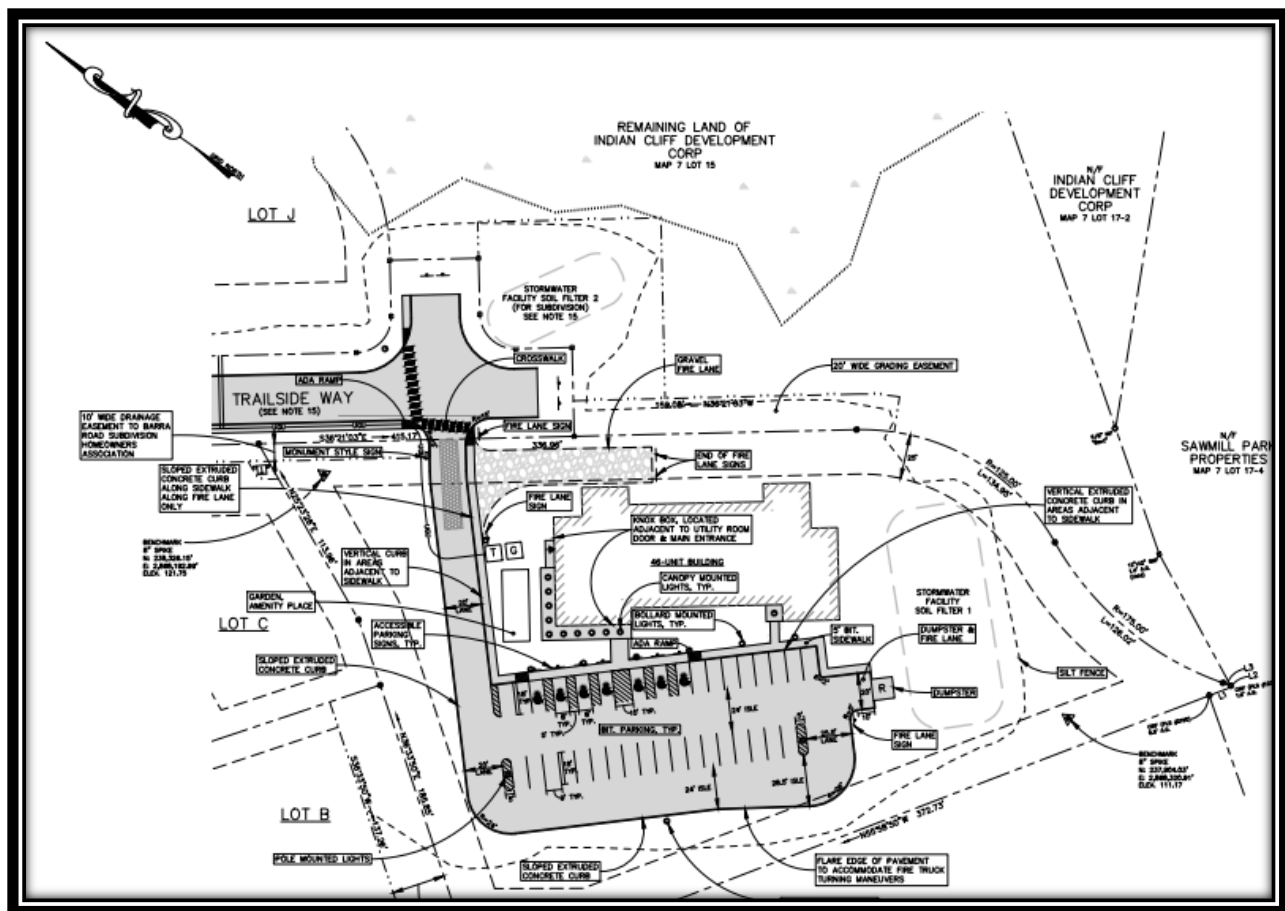
WHEREAS, the City Council of the City of Biddeford adopted the Biddeford Comprehensive Plan 2023 (the “Comprehensive Plan”) on June 6, 2023 which set the goal to “Increase the supply of safe and adequate housing for low- to moderate income person”;

WHEREAS, the Comprehensive Plan also provided for a Commercial Industrial Growth Area in which the City of Biddeford would pursue the goal of “higher density housing and mixed-use development along key corridors” including along Route 111; and

WHEREAS, the City, acting through the City Council, having determined that the rezoning of the Property would be and is consistent with the City’s growth management program and the Comprehensive Plan adopted pursuant to 30-A M.R.S.A. § 4321, *et seq.* and the existing and permitted uses within the original zones, has authorized the execution of this Agreement and the amendment of the Zoning Ordinance effective as of the date written above.

NOW THEREFORE, in consideration of the foregoing, the mutual agreements set forth herein, the City and the Developer hereby agree as follows:

1. Zone Change. The City hereby amends the Zoning Map of the City of Biddeford to rezone the “Project” Property (Lot A / Avesta Housing) to be subject to the terms of this Contract Zone #23 Agreement. Except as amended hereby, the requirements of the R-3 zoning district shall apply to the Property.
2. Avesta Housing Lot: The Avesta Housing lot shall be developed in substantial conformance with “Exhibit B – Concept Plan” shown below:



“Exhibit B - Concept Plan” - Avesta Housing – 46 Unit, LMI senior housing project

3. Number of “Project” Dwelling Units. The “Project” shall be entitled to develop up to 46-units within a four (4) story structure and associated parking, landscaping, stormwater detention, and green areas.
4. Lots B through G and Lot J: The Developer shall be entitled to develop each lot as a single-family or a 2-family (duplex) home.
5. Lot H: Lot H shall remain undeveloped except for stormwater management features and access easements granted to Reveler (Formerly Saxon) for development of the 60 Barra Road project (*Contract Zone #18 - Indian Cliff Development*).
6. Affordability.
 - (a) The Developer hereby agrees to develop the Project to meet or exceed the following affordability requirements: a household whose income does not exceed 70% of the median income for the area as defined by the United States Department of Housing and Urban Development under the United States Housing Act of 1937, Public Law 75-412, 50 Stat. 888, Section 8, as amended, can afford a majority (51% or more) of the units in the development without spending more than 30% of the household's monthly income on housing costs.

- (b) For the purposes of the Project, this affordability requirement shall be considered met for the building through an affordability covenant required and administered by Maine State Housing Authority pursuant to the Federal Low Income Housing Tax Credit Program.

7. Dimensional Requirements. Notwithstanding any other provision of the Code of Ordinances, the following dimensional requirements shall apply to the Property:

Minimum Square Feet Per Unit		N/A
Frontage		50 feet
Building Setbacks:		
	Front	25 feet
	Rear/Side	10 feet
Parking, Paving, Storage Setbacks:		
	Front	20 feet
	Rear/Side	0 feet
Max. Height		4 stories or 60 feet
Minimum Parking Required		.75 per dwelling unit
Open Space		Per JDA Master Plan

Notwithstanding any other provision of the Code of Ordinances to the contrary, the Project may, but is not required to, provide an increase in the number of required parking spaces by 5% to allow for visitor parking.

8. Phasing and Project Approvals.

- (a) For the avoidance of doubt, the Developer may amend any site or subdivision plan for the Project submitted and reviewed as part of or concurrent with this Contract Zone #23 in accordance with applicable site plan and subdivision provisions of the Code of Ordinances (except as amended hereby) without amending this Agreement, provided that said amended site plans or subdivision plans comply with the terms of this Agreement.

9. Miscellaneous.

- (a) The provisions of this Agreement shall be deemed restrictions on the use of the Property, except as this Agreement may be amended by future written agreement between the City and the Developer, or its successors and assigns, without the need for approval of any other party except as otherwise provided by law.
- (b) Agreement Runs with the Land. The restrictions, provisions and conditions of this Agreement are an essential part of the rezoning, shall run with the Property, shall bind the Developer and its successors and assigns of said Property or any part thereof, and shall inure to the benefit of and be enforceable by the City and its Code Enforcement Office.
- (c) Applicability of Code of Ordinances. Except as expressly modified by this Agreement, the use and occupancy of the Property shall be governed by and comply with the provisions of the Code of Ordinances of the City.

- (d) Recording. This Agreement shall be duly recorded by the Developer in the York Registry of Deeds within thirty (30) days of the date of this Agreement, with a copy of the recorded instrument provided to the City Manager, or else it is void.
- (e) Construction. This Agreement shall be construed in accordance with the laws of the State of Maine.

[REMAINDER OF PAGE BLANK – SIGNATURE PAGE TO FOLLOW]

IN WITNESS WHEREOF, the parties have caused this instrument to be signed all as effective as the day and date first written above.

CITY OF BIDDEFORD

WITNESS

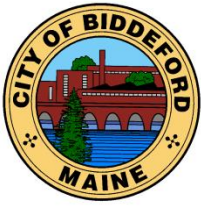
James Bennett, its City Manager

INDIAN CLIFF DEVELOPMENT
CORPORATION

WITNESS

Mike Eon, its President and Authorized Agent

[NEED TO ADD NOTARY TO MAKE IT RECORDABLE]



CITY OF BIDDEFORD

Planning and Development Department

David C.M. Galbraith
Deputy Director/City Planner
205 Main Street
P.O. Box 586
Biddeford, ME 04005
(207) 284-9115

David.Galbraith@biddefordmaine.org

PLANNING BOARD STAFF REPORT

TO: Chair Patoine and Members of the Biddeford Planning Board

FROM: David C.M. Galbraith, City Planner & Deputy Director of the Planning & Development Dept.

DATE: July 30, 2024

RE: **2024.21 Final Plan for Indian Cliff Development Corp for an 9-lot subdivision on Barra Road (Tax Map 7, Lot 15) in the R-3 & R-1 zones and Contract Zone (#23) Review.**

MEETING DATE: August 7, 2024 at 6:00 PM

1. INTRODUCTION

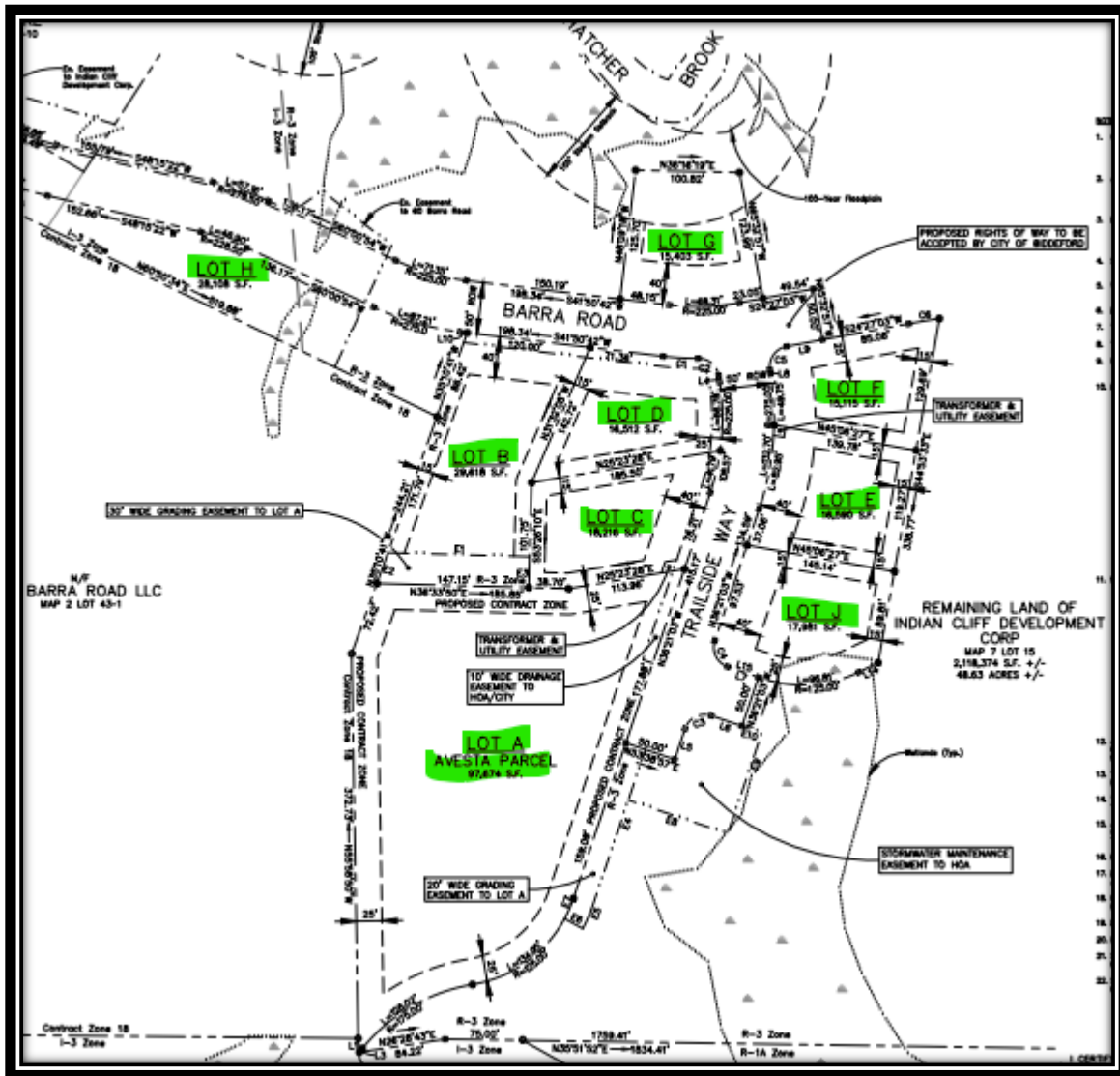
This Application was previously reviewed as a "Sketch Plan Review" on April 17, 2024, and as a "Preliminary Plan Review" on June 5, 2024. At this time the Applicant/s are seeking Final Subdivision and Site Plan Plan Approval. This application is being presented by Michael Eon, president of Indian Cliff Development Corporation. The subject property is approximately 55.94-acres in area, and the Applicant is seeking to subdivide approximately seven (7) acres into eight residential zoning lots and one lot exclusively for stormwater detention. One of the proposed lots is currently being reviewed for a new Avesta Housing project which consists of a four story, 46 unit, low / moderate income (LMI), senior housing development. The Avesta property (Tax Map 7, Lot 15) is a proposed 2.2-acre property, located to the east of Barra Road, immediately north of the 60 Barra Road project (Reveler, formerly Saxon), and is located in the R-3 zoning district.

The Avesta project is interwoven with this application which is seeking Subdivision and Site Plan approval and Contract Zone review / amendment with a positive recommendation to the City Council for final approval of the proposed Contract Zone #23. The subdivision project proposes to subdivide approximately 7 acres of the existing parcel to provide 9 new lots, with Lot A being the parcel proposed for Avesta's development, Lots B through G and Lot J being proposed as single-family or duplex lots for Indian Cliff Development Corp, and Lot H being a remainder lot that is not proposed for housing development. Lot H currently features stormwater and access easements granted to Reveler for development of the 60 Barra Road project, which construction is currently ongoing, and will propose to provide stormwater management for the extension of Barra Road proposed by Indian Cliff Development.

2024.21 Final Plan for Indian Cliff Development Corp for an 9-lot subdivision on Barra Road (Tax Map 7, Lot 15) in the R-3 & R-1 zones and Contract Zone (#23) Review. Planning Board

Meeting Date: June 5, 2024

Access to the proposed lots will be via a roadway extension off the end of Barra Road including a new proposed road, providing access to the Avesta development. The project will be accessed via an extension of Barra Road to a new connecting roadway named Trailside Way. In addition to Avesta's site plan review and approval, the combined projects will also require 1) A subdivision plan approval and 2) Contract Zone review and ultimately City Council review and approval. The proposed subdivision and Contract Zone are being requested by the Indian Cliff Development Corp. which is owned, in part, by Michael Eon.

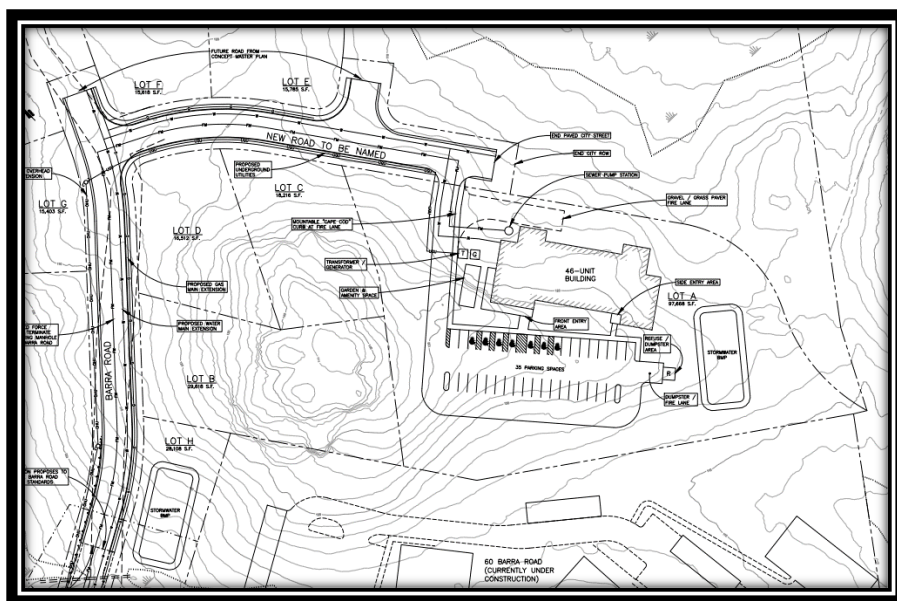


Proposed Nine (9) Lot Subdivision – Eight (8) Residential Lots, One (1) Detention

Indian Cliff Development – Contract Zone: The Contract Zone request was forwarded to the City Council to be discussed at their April 16, 2024 meeting. In turn the Council forwarded the proposed Contract Zone to the Planning Board for review and recommendation. The need for the Contract Zone is due to the proposed development of lot A by Avesta Housing

Meeting Date: June 5, 2024

The Avesta Housing project is currently before the Planning Board under a separate application for Site Plan Preliminary Plan review. Avesta is being represented by Ryan Fecteau, Senior Officer of Policy and Planning for Avesta Housing, and Christopher MacDonald, PE Civil Engineer of BH2M Engineering Consultants, who is also the project engineer for the proposed subdivision.



The proposed Avesta Housing project is a four story, 46 unit, low / moderate income (LMI), senior housing development. The subject property (Tax Map 7, Lot 15) is a proposed 2.2-acre property lot located to the east of Barra Road, immediately north of the 60 Barra Road project (Reveler, formerly Saxon), and is located in the R-3 zoning district.

Avesta Housing – 46 Unit, LMI senior housing project

2. PROJECT DATA/INFORMATION

1.	Applicant:	Indian Cliff Development Corp PO Box 444 Biddeford, ME 04005-0444
2.	Owner of Property:	Indian Cliff Development Corp
3.	Agent:	Christopher MacDonald P.E. BH2M 380B Maine Street Gorham, ME 04038

2024.21 Final Plan for Indian Cliff Development Corp for an 9-lot subdivision on Barra Road (Tax Map 7, Lot 15) in the R-3 & R-1 zones and Contract Zone (#23) Review. Planning Board

Meeting Date: June 5, 2024

4.	Surveyor:	Same as above
5.	Project Location:	Barra Road
6.	Project Tax Map #/Lot #:	Tax Map 7, Lot 15
7.	Lot Size:	55.94 acres
8.	Base Zoning:	R-3 & I-3
9.	Overlay Zoning:	N/A
10.	Existing Use:	Vacant Land
11.	Proposed Use:	9 Lot Subdivision
12.	Approvals Required:	Subdivision/Site Plan
13.	Uses in the Vicinity:	Commercial/Medical
14.	Waivers Needed:	a. Article VI, Section 26. F (slopes) b. Article XI .Article II.5.B.1.e.1 of the City Code, (exceeding pre-development stormwater run-off rates in post-development conditions)
18.	Waivers Granted:	a. None
22.	Other Non-City Permits Required:	Maine DEP Stormwater
23.	LDR Attachment A: Fees Paid:	Final Plan Fees Paid
25.	Planning Board Review History: April 17, 2024- Sketch Plan; June 5, 2024 Preliminary Plan; Final Plan August 7, 2024	

3. REVIEW PROCESS

Per City ordinance, this application is subject to Subdivision Review (Chapter 66 – Subdivisions) and approval by the Planning Board and Contract Zone (#23) review and recommendation to the City Council.

4. STAFF REVIEW

- **APPLICATION COMPLETENESS:** This application is for final subdivision review, and Staff recommends approving the proposed subdivision as it meets the City's subdivision standards.
- **ZONING:** The subject property is zoned R-3 & I-3 but this application includes a Contract Zone to allow the Avesta project to construct a four (4) story, senior housing development, which includes the same building height and bulk standards, as was previously approved by the Planning Board and City Council, as the adjacent Reveler (formerly Saxon) development, located to the immediate south of the proposed Avesta development.

- **REVIEW STANDARDS:**

Staff found the Final Plan application to satisfy City subdivision requirements.

- **WAIVERS:** The applicant is seeking two (2) waivers in conjunction with the proposed development, namely:

2024.21 Final Plan for Indian Cliff Development Corp for an 9-lot subdivision on Barra Road (Tax Map 7, Lot 15) in the R-3 & R-1 zones and Contract Zone (#23) Review. Planning Board

Meeting Date: June 5, 2024

- A. Article VI, Section 26. F, for slopes greater than 3:1 and grading within 10' of property lines. The project does propose 2:1 slopes in areas of the proposed roadside ditches, and some areas of grading will project within 10 of the ROW, and beyond across the ROW onto remaining lands of Indian Cliff Development corp. Easements are proposed for ditches that project onto proposed lots for continued maintenance post-construction.
- B. Article XI .Article II.5.B.1.e.1 of the City Code, exceeding pre-development stormwater run-off rates in post-development conditions. As we noted in the preliminary submission, we found that the proposed conditions show a very slight increase in anticipated run off at Analysis Point 1. These are generally very minor and are not anticipated to have perceptible downgradient effects. We also find that combined results of the total development draining directly to Thatcher Brook would be reduced with the summation of AP1 and AP2 being a net reduction over existing conditions. The project would formally request that a waiver be granted for this increase at AP1. See stormwater report section 1.9 for details.

City Staff are supportive of both of the requested Waivers.

5. STAFF RECOMMENDATION

The Applicant/s are seeking "Final Subdivision Review" and Staff is supportive of the proposed subdivision as designed, and above requested waivers subject to the proposed Findings of Fact (FOF) and Conditions of Approval (COA).

4. SAMPLE MOTIONS - WAIVERS:

- A. Motion to Approve Waiver Request to Article VI, Section 26. F, for slopes greater than 3:1 and grading within 10' of property lines.
- B. Motion to Approve Waiver Request to Article XI .Article II.5.B.1.e.1 of the City Code, exceeding pre-development stormwater run-off rates in post-development conditions.

5. SAMPLE MOTION – CONTRACT ZONE # 23:

- A. Motion to forward a positive recommendation to the City Council to approve Contract Zone # 23, as written.

6. SAMPLE MOTIONS - SUBDIVISION:

- A. Motion to Approve Case # 2024.21 Final Subdivision Plan for Indian Cliff Development Corp for a 9-lot subdivision on Barra Road (Tax Map 7, Lot 15) in the R-3 & R-1 zones, with the recommended Findings of Fact (FOF) and Conditions of Approval (COA).

2024.21 Final Plan for Indian Cliff Development Corp for an 9-lot subdivision on Barra Road (Tax Map 7, Lot 15) in the R-3 & R-1 zones and Contract Zone (#23) Review. Planning Board

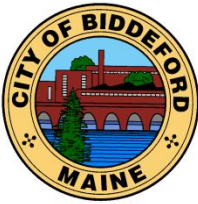
Meeting Date: June 5, 2024

B. **Motion to Table** Case # 2024.21 Final Subdivision Plan for Indian Cliff Development Corp for an 9-lot subdivision on Barra Road (Tax Map 7, Lot 15) in the R-3 & R-1 zones), based upon the following reasons:

- a) _____
- b) _____
- c) _____

C. **Motion to Deny:** 2024.21 Final Plan for Indian Cliff Development Corp for an 9-lot subdivision on Barra Road (Tax Map 7, Lot 15) in the R-3 & R-1 zones, based upon the following reasons:

- a) _____
- b) _____
- c) _____



CITY OF BIDDEFORD

Planning and Development Department

David Galbraith
City Planner & Deputy Director of Planning &
Development
205 Main Street
P.O. Box 586
Biddeford, ME 04005
(207) 284-9115
David.galbraith@biddefordmaine.org

FINDINGS OF FACT AND CONCLUSIONS OF LAW
Indian Cliff Development Corp
Barra Road (Tax Map 7, Lot 15) 9-lot Subdivision Approval
Contract Zone (#23)
August 7, 2024

RE: 2024.21 – Indian Cliff Development Corp for a 9 lot subdivision on Barra Road and Contract Zone (#23)

Pursuant to the provisions of the City of Biddeford Code of Ordinances Land Development Regulations, Chapter 66 (Subdivisions) and Article III (Design Standards and Improvements), the Biddeford Planning Board has considered the application of Based on its review, including supportive data, public hearing testimony and related materials contained in the record, the Planning Board makes the following Findings of Fact and Conclusions of Law:

FINDINGS OF FACT:

	<i>SUBJECT</i>	<i>DATA/INFORMATION</i>
1.	Applicant:	Indian Cliff Development Corp PO Box 444 Biddeford, ME 04005-0444
2.	Owner of Property:	Same as Applicant
3.	Agent:	Christopher MacDonald P.E. BH2M 380B Main Street Gorham, ME 04038
4.	Engineer/Surveyor:	Same as Agent
5.	Project Location:	Barra Road
6.	Project Tax Map #/Lot #:	Tax Map 7, Lots 15
7.	Existing Zoning:	R3 & I3
8.	Overlay Zoning:	N/A
9.	Existing Use:	Vacant Land
10.	Proposed Use:	9 Lot Subdivision
11.	Approvals Required:	Subdivision/Site Plan
12.	Uses in the Vicinity:	Commercial/Medical
13.	Parcel Size:	55.94 acres
14.	Limits of Disturbance:	1.00± acres
15.	Drainage Watershed:	Thacher Brook
16.	Water Supply:	Maine Water
17.	Sewerage Disposal:	Public Sewer
18.	Solid Waste Disposal:	Private Hauler
19.	Fire Protection:	City of Biddeford
20.	Other Non-City Permits Required:	Maine DEP Stormwater
21.	LDR Attachment A: Fess Paid:	All Fees Paid

FINDINGS OF FACT AND CONCLUSIONS OF LAW
Indian Hill Development Corp
9 Lot Subdivision Barra Road and Contract Zone (#23)
Subdivision/Site Plan Approval
August 7, 2024

CONCLUSIONS OF LAW:

1. The proposed use meets specific requirements set forth in this ordinance and would be in compliance with applicable state or federal laws;
2. The proposed use would not create fire safety hazards by providing adequate access to the site, or to the buildings on the site, for emergency vehicles and would not create hazards through the storage of chemicals and wastes;
3. The proposed exterior lighting, where allowed, would not create hazards to motorists traveling on adjacent public streets or is adequate for the safety of occupants or users of the site or would not damage the value and diminish the usability of adjacent properties;
4. The provisions for buffers and on-site landscaping provide adequate protection to neighboring properties from detrimental or unsightly features of the development;
5. The proposed use would not have a significant, detrimental effect on the use and peaceful enjoyment of abutting property as the result of noise, vibrations, fumes, odor, dust, glare, hours of operation, or other causes;
6. The provisions for vehicular loading and unloading and parking and for vehicular and pedestrian circulation on the site and onto adjacent public streets would not create hazards to public safety or traffic congestion;
7. The proposed use would generate a volume of traffic that can reasonably be accommodated by the existing road network, or would not create unreasonable traffic hazards or would not exacerbate an existing traffic hazard, or would not create unreasonable traffic congestion;
8. The proposed use would not have a significant, detrimental effect on the value of adjacent properties which could be avoided by reasonable modification of the proposal;
9. The proposed use would not have an adverse impact on the privacy of the residents of the immediate area (within 500 feet) which could be avoided by reasonable modification of the proposal;
10. The proposed use would be in compliance with Biddeford's Comprehensive Plan;
11. The proposed use would not have an adverse impact on the immediate neighborhood or the community relative to architectural design, scale, bulk and building height, identity and historical character, or visual integrity, which could be avoided by reasonable modification of the proposal;
12. The design of the site would not result in significant flood hazards or flood damage or would be in conformance with applicable flood hazard protection requirements;
13. Adequate provision has been made for disposal of wastewater or solid waste or for the prevention of ground or surface water contamination;

FINDINGS OF FACT AND CONCLUSIONS OF LAW
Indian Hill Development Corp
9 Lot Subdivision Barra Road and Contract Zone (#23)
Subdivision/Site Plan Approval
August 7, 2024

14. Adequate provision has been made to control erosion or sedimentation;
15. Adequate provision has been made to handle stormwater runoff or other drainage problems on the site; and the proposed development will not unduly burden off-site surface water systems;
16. The proposed water supply would meet the demands of the proposed use for fire protection purposes;
17. Adequate provision has been made for the transportation, storage, and disposal of hazardous substances and materials as defined by state law;
18. The proposed use would not have an adverse impact on scenic vistas or on significant wildlife habitat or wetland areas and water bodies which could be avoided by reasonable modification of the proposal;
19. When located in the Shoreland Zone, the proposed use would meet the purposes of Shoreland Zoning as identified in Article XIV, Section 1 (Purposes) of this ordinance.

APPROVAL GRANTED:

Based on the evidence available and the conclusions above, the Biddeford Planning Board approves the proposed project summarized within the attached Staff report and pursuant to the provisions of the City of Biddeford Code of Ordinances Land Development Regulations, Chapter 66 (Subdivisions) and Article III (Design Standards and Improvements), the Biddeford Planning Board has approved the application of Final Site Plan review for a proposed 9 Lot Subdivision on Barra Road (Tax Map 7, Lot 15) for the Indian Cliff Development Corp the recommended Findings of Fact (FOF) with the following Conditions of Approval (COA):

1. The material provided for the proposed project has been reviewed only for general conformance to the City technical requirements. The applicant(s) and/or their technical consultant shall be responsible for the actual design details and completeness of their work. It is incumbent upon the applicant(s) to ensure that the project is in conformance and complies with all City Codes, ordinances and regulations as well as with all state regulations, including, but not limited to, space and bulk standards, performance standards, use standards and other zoning type requirements.
2. All work shall be in conformance with the approved plans and submission documents. No deviations from the approved plans are permitted without prior approval from the Planning Board for major changes, and from the City Planner and City Engineer for minor changes. The City Planner shall make the determination of major or minor.
3. A Letter of Credit or other surety acceptable to the City of Biddeford shall be submitted prior to the issuance of permits or site work being initiated. The financial guarantee shall be established for 150% of the cost of the following improvements:
 - a. Landscaping
 - b. Paving
 - c. Work within ROW (existing or proposed)

FINDINGS OF FACT AND CONCLUSIONS OF LAW
Indian Hill Development Corp
9 Lot Subdivision Barra Road and Contract Zone (#23)
Subdivision/Site Plan Approval
August 7, 2024

- d. Stormwater Drainage
 - e. Loam & seed
 - f. Sediment & erosion control
 - g. As-Built Plans
 - h. Property Monuments
4. Prior to any ground disturbance, the applicant shall establish a construction inspection account equal to: \$2,500.00.
 5. Prior to any ground disturbance, a pre-construction meeting with the owner/applicant, contractor, and City is required. Contact the Engineering Department to schedule this meeting.
 6. Contact the Department of Public Works for driveway location permits, curb cut permits and/or street opening permits prior to the start of construction.
 7. An as-built plan must be provided to the City of Biddeford Engineering Office at the end of the project electronically, which can be read by the City of Biddeford's Geographic Information System software. Note: Any modifications to the Planning Board approved development plans shall be reviewed and approved by the City Planner prior to being made, including any "field changes".
 8. The applicant shall incorporate appropriate erosion control measures into this project to reduce erosion affects from the work. All disturbed areas must be re-vegetated and/or otherwise stabilized at the appropriate stage of the work per Maine DEP standards in the Best Management Practice (BMP) manual.
 9. That the Article VI Performance Standards requirements regarding Dust, Fumes, Vapors & Gases (sect 25), Explosive Materials (sect 28), Glare (sect 37), Noise (sect 48) be followed.
 10. The applicant shall obtain all other pertinent local, state and federal permits, licenses, and insurance such as blasting, building, electrical, plumbing, etc. prior to commencing business.
 11. At the completion of the project the owner/applicant shall request a final inspection. This request shall be directed to the Planning Office. Performance guarantees and remaining escrow accounts shall not be released until the Planning Office certifies that the project has been completed and is in compliance with the approval and all applicable City Ordinances.
 12. The applicant shall submit approved plans for signature of the City's Planning Board, which shall be recorded in the York County Registry of Deeds. An electronic copy of the recorded plan shall be sent to the Planning Office.\
 13. All conditions of approval previously adopted for the property are hereby reaffirmed.
 14. Prior to the Issuance of a Building Permit the Applicant shall pay a one-time fee of \$10,650. for the Thatcher Brook Impact Fee, as outlined below:

FINDINGS OF FACT AND CONCLUSIONS OF LAW
Indian Hill Development Corp
9 Lot Subdivision Barra Road and Contract Zone (#23)
Subdivision/Site Plan Approval
August 7, 2024

CFUP Fee Schedule – Indian Cliff Development Subdivision Project			
Type of Surface	Compensation Fee (per acre)	Proposed Area (acres)	Compensation Fee
Non-roof Impervious Area	\$12,500	0.66	\$8,250
Roof	\$5,000	N/A	\$N/A
Landscape Area	\$2,500	0.96	\$2,400
Total			\$10,650

15. Prior to the issuance of building permits for the single and/or two-family properties, proposed within this subdivision, each lot shall pay their respective fees for the following:
- A. CFUP / Thatcher Brook Impact Fees, as calculated under Condition #14 above.
 - B. Curb-Opening Permit Fee: Prior to the issuance of a Building Permit the Applicant shall pay a curb-opening fee as calculated by the Engineering Department.
 - C. Sewer Connection Fee: Prior to the issuance of a Building Permit the Applicant shall pay a sewer connection fee as calculated by the Engineering Department.
16. Prior to the scheduling of the required Pre-construction meeting the Applicant shall make any required changes to the project Civil Plans for the review and approval of the Public Works Director.
- ~~17. Comments submitted by the 3rd Party Reviewer dated July 25, 2024 will be considered as Conditions of Approval.~~

Larry Patoine Planning Board Chair

Date

City of Biddeford

Subdivision Final Application

BARRA ROAD SUBDIVISION

Barra Road, Biddeford, Maine

July 2024

Applicant

Indian Cliff Development Corp.
260 Main Street
P.O. Box 444
Biddeford, ME 04005

Agent

BH2M
380B Main Street
Gorham, Maine 04038



David Galbraith
City Planner of Biddeford, Maine
205 Main Street
P.O. Box 586
Biddeford, ME 04005

July 17, 2024

Re: Barra Road Subdivision
Final Subdivision Application

Dear David;

BH2M has been retained by Indian Cliff Development Corp. to provide Engineering, Surveying, and Permitting services for development of a 9-lot subdivision project proposed along the end of Barra Road in Biddeford. The project proposes a subdivision of an existing parcel on Map 7 lot 15 owned by Indian Cliff Development Corp, of which Mike Eon represents. In general, the subdivision project proposes to subdivide approximately 7 acres of the existing parcel to provide 9 new lots, with Lot A being the parcel proposed for Avesta's development of a 46-unit affordable elderly housing project being applied for in parallel to this application, Lots B through G & J being proposed as single family or duplex residential house lots to be developed by others, and Lot H being a remainder lot that is not proposed as buildable for housing..

We had previously provided a Preliminary Subdivision application for this project on May 15, 2024, and had a Preliminary approval for these applications at the June 5 Planning Board meeting. In advance of and following that meeting, we have received comments from City staff from Planning, Fire, Engineering and Department of Public works, as well as a 3rd party technical review of the plans and submissions. Based on these, we are providing a revised plan set and additional information for the City's review.

While most changes to the plans have been detailed in nature, the largest change proposed is to the hammerhead configuration at the end of Trailside Way. Based on conversations with the Fire Department, Department of Public Works, and City Engineering, the turn around now meets a minimum 70' dimension for each side of the turn around. The location of Lot J has also been revised to better accommodate the geometry of the turn around.

We have also had follow up conversations with Maine Water, having received an ability to service letter, and have made detail changes to the low pressure force main sewer system, providing updated detail calculations for this project and the subdivision which have been reviewed by the City Engineering department.

While reviewing the final details of the project, we understand that requests for waivers will be necessary based on the proposed details of the project. The project formally requests waivers for the following:

- Article VI, Section 26. F, for slopes greater than 3:1 and grading within 10' of property lines. The project does propose 2:1 slopes in areas of the proposed roadside ditches, and some areas of grading will project within 10 of the ROW, and beyond across the ROW onto remaining lands of Indian Cliff Development corp. Easements are proposed for ditches that project onto proposed lots for continued maintenance post-construction.
- Article XI .Article II.5.B.1.e.1 of the City Code, exceeding pre-development stormwater run off rates in post-development conditions. As we noted in the preliminary submission, we found that the proposed conditions show a very slight increase in anticipated run off at Analysis Point 1. These are generally very minor and are not anticipated to have perceptible downgradient effects. We also find that combined results of the total development draining directly to thatcher brook would be reduced with the summation of AP1 and AP2 being a net reduction over existing conditions. The project would formally request that a waiver be granted for this increase at AP1. See stormwater report section 1.9 for details.

In support of this permit application, we are including the following attachments:

Attachment 1 – Updated Planning Department Drawing Checklist
Attachment 2 – Response to Comments
Attachment 3 – Maine Water Ability to Service Letter
Attachment 4 - Updated Sewer Design Report
Attachment 5 – City Cost Estimate Worksheet
Attachment 6 – Updated Stormwater Management Report

We trust that these additional details will provide you with the necessary information to bring the Subdivision application to the Planning Board for Final Approval. If you need any additional information, feel free to contact me directly.

Sincerely,

Christopher MacDonald, P.E.
Civil Engineer

Cc Mike Eon – Indian Cliff Development Corp.

ATTACHMENT 1
UPDATED PLANNING DEPARTMENT DRAWING CHECKLIST

CITY OF BIDDEFORD - SITE PLAN APPLICATION DRAWING CHECKLIST

LAST REVISED: 04/18/23

CHECKLIST DIRECTIONS:

1. The following checklist must be completely filled out by the applicant for any Site Plan submittal to the Planning Department.
2. Applicant to confirm all of the items listed are included within the submittal. Any missing items must have adequate reasoning to justify their absence.
3. City to review applicant's submittal and checklist responses. Projects missing submittal information with non-acceptable reasoning will be rejected.
4. Items in **BLACK** are required for 'Preliminary Site Plan' approval & 'Final Site Plan' approval.
5. Items in **BLUE** are only required for 'Final Site Plan' approval.

SUBMITTAL INFORMATION - TO BE FILLED OUT BY APPLICANT	
Project Name:	Barra Road Subdivision
Planning Board # (if available):	2024.21
Applicant Name/Info:	Indian Cliff Development Corp
Submittal #/Type (Prelim/Final):	Final Subdivision Application
Submittal Date:	17-Jul-24

SUBMITTAL REQUIREMENT		APPLICANT RESPONSE		CITY REVIEW RESPONSE	
ITEM NUMBER	DESCRIPTION	INFORMATION PROVIDED (YES/NO)	REASON NOT PROVIDED/COMMENT	ACCEPTABLE (YES/NO-REVISE & RESUBMIT)	COMMENT
1	GENERAL PLAN REQUIREMENTS				
A	Drawing specific legends (linetypes, hatches, etc.)	Yes			
B	Individual drawing layer control should be utilized: freeze/thawing, changing lineweights, and screening (i.e. screen existing layers on a proposed plan, freeze topography and underground utilities on a proposed site plan)	Yes			
C	North arrows, standard engineering scale viewports, dated revision blocks	Yes			
D	All drawings and surveys must be in the following coordinate systems: NAD83 Maine State Plane West (Horizontal) and NAVD88 (Vertical)	Yes			
E	Drawings need to be designed, signed & sealed by a Maine licensed professional engineer (PE); all boundary survey data needs to be performed by a licensed professional land surveyor (PLS)	Yes			
2	COVER SHEET				
A	Project Name & Property Address	Yes			
B	Project Team Contact Information (Owner, Engineer, Contractor, etc.)	Yes			
C	Site Location Map	Yes			
D	Sheet Set List of Drawings	Yes			
E	Tax Map and Lot ID	Yes			
F	Zoning & Shoreland Zone Information	Yes			
G	Existing Use Description	Yes			
H	Proposed Use Description	Yes			
I	Required Waiver/Variances (Yes/No); if yes, plan must clearly list waivers/variances requesting	Yes	See cover letter for details on waivers being requested		
J	Name of Drainage Watershed	Yes	Thatcher Brook		
K	Within the MS4 Urbanized Area (Yes/No)	Yes			
L	Natural resources (streams, wetlands, etc.) located on-site or adjacent to the property (Yes/No)	Yes			
M	Within the 100-year Flood Zone (Yes/No)	Yes			
N	Public Road Proposed (Yes/No)	Yes			
O	Private Road Proposed (Yes/No)	No			
P	Public Sewer Connection (Yes/No); if yes, need to include a proposed sewer flow calculation per Maine's Subsurface Wastewater Disposal Rules, Chapter 241, Section 4 (Tables 4A & 4C)	Yes	Proposed to be serviced by Low Pressure Sewer		
Q	Public Storm Drain Connection (Yes/No)	No	No public storm drain connections proposed		
R	Limits of Disturbance in acres	Yes	Provided in Stormwater Report		
S	Pervious Land Cover square footage, existing and proposed	Yes	Provided in Stormwater Report		
T	Impervious Land Cover square footage (Pavement/Gravel), existing and proposed	Yes	Provided in Stormwater Report		
U	Building Roof square footage, existing and proposed	No	No buildings proposed, see Avesta Site Plan Application		
V	Assigned Planning Board Number	Yes	2024.21 As assigned during sketch plan application		
W	Estimated cut/fill earthwork volumes; if disturbing within Flood Zone, separate set of earthwork volumes required (site vs. within flood zone)	Yes	Reviewing an overall comparison of existing conditions and proposed conditions, we find that the project yields approximately 1370 cy of cut and 4520 cy of fill, or a net of 3150 cy of fill; not accounting for subbase materials or structual excavation for structures		
3	EXISTING CONDITIONS PLAN				
A	Horizontal & Vertical Datums annotated (NAD83 & NAVD88)	Yes			
B	Survey Benchmark Locations (with XYZ Coordinates annotated)	Yes	Plans have been updated to include benchmark information		
C	Property & Right-of-Way Lines	Yes			
D	Boundary line information (bearings, distances, etc.)	Yes			
E	Property pin and monumentation locations	Yes			
F	Existing easements with proper ownership identified	Yes			
G	Road Names & Individual Lot Labels (Map, Lot, Owner, Acreage)	Yes			
H	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
I	100-year Flood Zone Limits & Elevation	Yes			
J	USDA-NRCS Soil Boundaries and Labels	Yes			
K	Existing contours with adequate contour labelling; minimum 1' contour interval	Yes			
L	Existing building FFEs annotated	No	No existing buildings on proposed project area		
M	Spot elevations for existing building corners, door entrances, accessible parking/walkways, road centerlines, and bottom/top of curbs	No	No existing buildings on proposed project area		
N	Existing buildings & structures	No	No existing buildings on proposed project area		
O	Existing pavement areas & number of parking spaces	No	No existing buildings on proposed project area		
P	Existing ADA ramp geometry, detectable warning plates, and ADA parking spaces	No	No existing buildings on proposed project area		
Q	Existing site features (sidewalks, retaining walls, curbing, lightpoles, guide rails, dumpsters, fencing)	Yes	Abutting project under construction, completed conditions shown assumed as existing		
R	Existing signage and striping	Yes			

	S Existing underground utility locations (storm, sewer, force main, water, gas, elec, tele)	Yes			
	T Existing above-ground utility locations (manholes, catch basins, utility poles, hydrants, transformers, riprap)	Yes			
	U Rim, invert in, invert out, pipe size, cardinal direction (N, E, S, W) information for any existing utility infrastructure being tied into (upstream/downstream/outfalls)	Yes			
	V Existing tree lines, street trees, free-standing trees (12" or larger diameter at breast height), and vegetation	Yes			
	W Location of any borings, drinking wells, and monitoring wells	No	No borings conducted for the subdivision project		
4	SITE DEMOLITION & EROSION CONTROL (E&SC) PLAN				
	A Limits-of-disturbance outlined and acreage annotated	Yes			
	B Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
	C 100-year Flood Zone Limits	Yes			
	D Callout existing site features to be demolished/removed/replaced	Yes			
	E Callout existing utilities to be demolished/removed/abandoned-in-place	Yes			
	F Hatch existing buildings and pavement to be removed	Yes			
	G Construction Entrance location(s)	Yes			
	H Perimeter E&SC control location(s) (i.e. silt fence, erosion berm mix)	Yes			
	I Stockpile and staging area(s) identified (with proper perimeter control)	Yes			
	J Inlet protection location(s)	Yes			
	K Note requiring contractor to implement dust control measures throughout construction	Yes			
	L Note requiring contractor to pave utility trenches within right-of-way within 3 days of excavation or prior to any rain event	Yes			
	M If groundwater expected, show dewatering/silt bag location(s); show temporary pumping routing				
	N If large development is proposed with an extensive underground stormwater conveyance network, show sediment trap/basin location(s) needed for constructability/phasing; provide sizing calculations				
5	SITE PLAN/SUBDIVISION PLAN				
	A Partial Site Plans needed for any viewport scale greater than 1"=20'	No	1" = 30' scale plans appropriate for project detail		
	B Existing property and right-of-way lines	Yes			
	C Proposed subdivision lot lines and labels	Yes			
	D Required Zoning Setbacks shown with dimensions and annotation	Yes			
	E Bulk requirement summary table (zoning/parking calculations)	Yes			
	F Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
	G 100-year Flood Zone Limits	Yes			
	H Proposed building outlines, door entrances and loading docks	Yes	See Avesta Site Plans		
	I Proposed building labels	Yes			
	J Proposed road extents; provide clear annotation if roads will be public or private	Yes			
	K Proposed parking and accessible parking locations; annotate parking space counts	Yes			
	L Proposed signage, parking striping, and traffic striping	Yes			
	M Detailed ADA ramp geometry, detectable warning surfaces, and ADA parking striping/signage; existing & proposed	Yes			
	N Proposed site features (i.e. curbing, walls, fencing, guiderail, fire hydrant, transformers, light pole locations)	Yes			
	O Separate hatching for buildings, sidewalks, pavement, landscaping	Yes			
	P Proposed landscaping; detailed landscaping design should be on separate plans	No	Not Applicable		
	Q Designated snow storage areas	Yes			
	R Proposed dumpster locations and trash removal access	No	Not Applicable		
	S Linear dimensions of all drive aisles, sidewalk widths, parking spaces, loading docks	No	Not Applicable		
	T Radial dimensions for all curbs, landscaped islands, sidewalks	Yes			
	U Road centerline stationing shown, labelled every 0+50' with curve data	Yes			
	V If Private Road is proposed, final recorded plans must clearly note that proposed private roads will not be submitted in the future for public acceptance	No	Not Applicable		
	W If Private Road is proposed, final recorded plans must clearly note that the City is not responsible for any maintenance, repair, plowing, or trash removal of proposed private roads	No	Not Applicable		
	X Planning Board signature block for final recording	Yes			
6	GRADING PLAN				
	A Partial Grading Plans needed for any viewport greater than 1"=20'	No	1" = 30' scale plans appropriate for project detail		
	B Limits-of-disturbance outlined and acreage annotated	Yes			
	C Proposed Building Labels with Individual Finished Floor Elevations (FFE)	No	Not Applicable		
	D Existing contours with adequate contour labelling, screened; minimum 1' contour interval	Yes			
	E Proposed contours with adequate contour labelling; minimum 1' contour interval	Yes			
	F Detailed grading for all ditches, swales, outfalls, and riprap	Yes			
	G All proposed contours tie-into existing contours at limits-of-disturbance outline	Yes			
	H Existing spot elevations for all asphalt and curb tie-in locations	Yes			
	I Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
	J 100-year Flood Zone Limits	Yes			
	K Proposed spot elevations for all important roadway geometric points and/or on a 50' maximum interval: low/high points, PC/PT, road centerline, edge-of-asphalt	Yes			
	L Proposed spot elevations for all curblines (bottom/top-of-curb) and sidewalks	Yes			
	M Proposed spot elevations for all parking and drive aisle geometry points	Yes			
	N Proposed spot elevations for all building corners and door-entry locations	No	Not Applicable		
	O Proposed retaining wall/loading dock elevations (bottom/top of wall)	No	Not Applicable		
	P Proposed spot elevations for all ADA ramp/landing/parking stall geometry points	No	Not Applicable		

	Q Proposed % slope arrows for all ADA parking spaces and sidewalks	No	Not Applicable		
	R Proposed longitudinal % slope arrows for drainage ditch centerlines	Yes			
	S Proposed % slope arrows for roads, parking areas, and landscape tie-in areas	Yes			
	T Estimated cut/fill earthwork volumes; if disturbing within Flood Zone, separate set of earthwork volumes required (site vs. within flood zone)	Yes	Reviewing an overall comparison of existing conditions and proposed conditions, we find that the project yields approximately 1370 cy of cut and 4520 cy of fill, or a net of 3150 cy of fill; not accounting for subbase materials or structural excavation for structures		
7	ROAD PROFILES (if public/private road proposed)				
	A Existing surface; dashed and screened	Yes			
	B Proposed surface; continuous and bold	Yes			
	C Corresponding centerline stationing and curve data annotation	Yes			
	D Road cross-section including proposed surface cross slopes; include multiple sections for various road cross slope conditions proposed (crowned, superelevated)	Yes			
	E Horizontal and vertical scale bars	Yes			
	F Clear annotation if proposed road will be public or private	Yes			
	G If Private Road is proposed, plans must clearly note that proposed private roads will not be submitted in the future for public acceptance	No	Not Applicable		
	H If Private Road is proposed, plans must clearly note that the City is not responsible for any maintenance, repair, plowing, or trash removal of proposed private roads	No	Not Applicable		
8	UTILITY PLAN				
	A Existing underground utility locations; screened (storm, sewer, force main, water, gas, electric, telecom)	Yes			
	B Existing above-ground utility locations; screened (manholes, catch basins, utility poles, hydrants, riprap)	Yes			
	C Rim, invert in, invert out, pipe size, cardinal direction (N, E, S, W) information for any existing utility infrastructure being tied into (upstream/downstream/outfalls)	Yes			
	D Proposed underground utility locations; bold (storm, sewer, force main, water, gas, electric, telecom, lighting)	Yes			
	E Proposed above-ground utility locations; bold (manholes, catch basins, utility poles, hydrants, transformers, riprap)	Yes			
	F Proposed storm culverts, outfalls, and riprap locations and sizes	Yes			
	G Storm/sewer structure labels must include: rim, inverts in, inverts out, pipe sizes, cardinal directions (N, E, S, W)	Yes			
	H Storm/sewer pipe labels must include: linear footage, pipe size, material, slope	Yes			
	I Flow directional arrows for storm & sewer pipes	Yes			
	J Proposed & existing site features shown that could conflict with proposed utilities (trees, signs, lightpoles, bollards, foundations, guiderails)	Yes			
	K All storm drains must be sized to convey the 25-year storm	Yes			
	L Sewer force main sizes and invert elevations	Yes			
	M Sewer pump station locations, model, rim, inverts, pipe sizes, cardinal directions (N,E,S,W)	Yes			
	N Grease trap & oil-water separator locations, sizes, elevations	No	Not Applicable		
	O Water, gas, electric, and telecom sizes labelled	Yes			
9	UTILITY PROFILES	No	All Gravity Information shown on plans		
	A Utility profiles for all gravity storm drains and sewer pipes, including all laterals, catch basins, culverts, and outfalls; profiles preferred to be aligned on the pipe centerline (not superimposed on the road centerline)				
	B Existing surface; dashed and screened				
	C Proposed surface; continuous and bold				
	D Storm/sewer structure labels must include: rim, inverts in, inverts out, pipe sizes, cardinal directions (N, E, S, W)				
	E Storm/sewer pipe labels must include: linear footage, pipe size, material, slope				
	F Existing and proposed gravity pipe crossings shown; sizes labelled and depths/clearance annotated				
	G Existing and proposed electric/water/telecom/gas crossings shown at approximate depths; sizes labelled and depths/clearance annotated				
	H Known ledge or groundwater elevations				
	I For all storm drains, 25-year HGL must be shown on profiles with starting tailwater condition identified				
	J For storm outfalls, include riprap sizing and grading extents				
	K Horizontal and vertical scale bars				
10	DETAILS				
	A Road section detail, including pavement & gravel depths	Yes			
	B Sidewalk, paver, crosswalk, and any other pavement section details	Yes			
	C Pavement sawcut detail	Yes			
	D Utility trench/backfill detail	Yes			
	E All site feature details; curbing, retaining walls, fencing, guiderails, dumpsters, etc.	Yes			
	F Signage, striping, and ADA details	Yes			
	G E&S notes and details; only show applicable/proposed measures	Yes			
	H Utility structure details (manholes, cleanouts, fittings, handholes, transformer pads, hydrants)	Yes			
	I Storm outfall & riprap details	Yes			
	J Drainage ditch cross section identifying minimum depth, minimum bed width, and maximum side slopes	Yes			
	K Pump station, grease trap, and oil-water separator details	Yes			
	L Conduit section details	Yes			

M	Miscellaneous details (as needed)	Yes			
11	LANDSCAPING, LIGHTING & PHOTOMETRIC PLANS				
A	As required by ordinance; at a minimum: locations, counts, and species/models must be identified	Yes			
B	Landscaping & lighting details	Yes			
12	DOCUMENTS/REPORTS/CALCULATIONS				
A	On initial preliminary submittal applications, applicant must submit a development review and inspection fee. Applicant to coordinate fee amount with City Planner prior to submittal. This fee will be drawn against to cover the following type of services throughout the project life cycle (and may require replenishing): i. 3rd Party City Peer-Review ii. Site Inspections during the permitting process iii. Erosion & Sediment Control Inspections during construction iv. Right-of-Way Inspections during construction	Yes	Per Sketch plan application, Sketch Plan Application fees of \$6,835 and Preliminary Application fees of \$1,515 have been paid previously, and the Final Application fees of \$825 have been submitted with this application		
B	Predevelopment & Post-development Drainage Area Maps, including: i. Subdrainage areas delineated and labeled ii. Points of Interest/Analysis shown and labeled iii. Hatching for different land cover areas (impervious, pervious, gravel) iv. Time of concentration (Tc) paths & durations v. Four City standardized stormwater summary tables	Yes			
C	An approved 'Sewer Ability-to-Serve Letter' from the Engineering Department: i. Applicant to submit proposed sewer flow calculations per Maine's Subsurface Wastewater Disposal Rules, Chapter 241, Section 4 (Tables 4A & 4C)	Yes	Provided in preliminary application		
D	A Performance Guarantee Cost Estimate utilizing Planning's template	Yes	Included as Attachment 5		
E	25-year hydraulic calculations for all storm conveyance piping (rational method), including starting tailwater conditions/documentation	Yes	See Stormwater Report		
F	If any SWM water quality BMP or detention facility is proposed, hydrologic model exports/hydrographs must be submitted for the for the 2, 10, 25, & 100-year storm frequencies	Yes	See Stormwater Report		
G	Sizing calculations for any SWM water quality BMP or detention facility	Yes	See Stormwater Report		
H	A stormwater maintenance manual for any proposed SWM water quality BMP or detention facility, including: i. Annual maintenance requirements ii. Annual inspection requirements by a licensed PE; noting that all inspection reports/logs need to be submitted to the Engineering Department by March 1st each following year, identifying what on-going maintenance has occurred and what remedial repairs are needed iii. Signed Property Owner Agreement: including the current property owner's contact information and signature; it must be noted that all stormwater BMP maintenance requirements are linked to the property for perpetuity and transfer to any new ownership	Yes	See Stormwater Report		
I	Salt Management Plan	Yes			
J	Sewer pump station sizing calculations	Yes			
K	Sewer pump station maintenance plan	Yes			
L	Grease trap sizing calculations	No	Not Applicable		
M	Homeowner Association (HOA) agreement for any private road serving two (2) lots or more	Yes	Provided in preliminary application		
N	Summary list & copy of any required DOT/DEP/USACE permits & approvals	Yes	Project has applied for Maine DEP Stormwater Law Permit, copies provided to City		

ATTACHMENT 2
RESPONSE TO PRELIMINARY COMMENTS

July 17, 2024

David Galbraith
City Planner of Biddeford, Maine
205 Main Street
P.O. Box 586
Biddeford, ME 04005

Re: Barra Road Subdivision
Preliminary Site Plan Review Response to Comments

Dear David,

We have reviewed the comments from the 3rd party review letter from Site Design Associates dated May 29, 2024 for the preliminary site plan review of Barra Road Subdivision. Below we are providing responses to each of those comments:

Stormwater Management

1. The stormwater management report was developed to address local and state regulations. The report and drainage plans indicate that subsequent to development, the post development stormwater runoff rates for the 2, 10 and 25 year storms will be equal to or less than the existing rates of runoff at three analysis points around the site perimeter. This meets the requirements for stormwater runoff control under the city code. Additionally, two underdrained soil filters have been designed to enhance the stormwater runoff quality, in fulfillment of the DEP general standards. Lastly, because the project is located in the direct watershed of Thatcher Brook, an urban impaired stream, under the DEP Stormwater Law the applicant must mitigate impacts by reducing or eliminating an onsite or off site existing impervious area, or by paying a compensation fee. It is our understanding that the fee in Biddeford would be paid to a Compensation Fee Utilization Fund administered by the city for Thatcher Brook. The applicant intends to pay the fee for this project.

Response: This understanding statement is correct.

2. Soil filter 2 appears to be located in an easement shown on the subdivision plan along with the note "Stormwater maintenance easement to city/HOA." We assume the city will require that the maintenance be the responsibility of the HOA. If that is the case, the note should be revised, and the easement for soil filter 3 clarified as well. We recommend that the requirements of Chapter 34- 481(c) be applied to both soil filters 2 and 3, assuming the HOA will be responsible for maintenance.

Response: The code chapter referenced here is no longer included in the City code. However, in discussions with City Staff, we understand that the requirements have been moved to section 34-482. The Stormwater I&M plan has been updated section

1.6 paragraph 5 to detail the City’s inspection and reporting requirements, as well as have included the required form as Appendix F of the I&M plan. City staff have also clarified that acceptance of the stormwater facilities will not be taken with acceptance of the ROW’s; maintenance of the soil filters will be the responsibility of the HOA at this time.

3. The plans appear to reflect a private force main in the future public right of way, with individual pump stations on each lot. Is this acceptable to the city? It seems an option would be to install gravity sewers to a central pump station located to accommodate the planned and future development.

Response: As discussed with City staff, the City does intend on accepting the main line low pressure force main when accepting the rest of the street as public. The City will not maintain service connections. A gravity / conventional pump station approach was also reviewed for this site, but given the topography of the site and the need for multiple pump stations, a low pressure force main was deemed to be the least impactful option.

Drainage Plans and Calculations

1. The stormwater model for soil filter 3 indicates that SC-1J will be 0% impervious, even though it is part of lot B. This should be clarified.

Response: Lot B’s watershed is split between SC-1I and SC-1J. Given the extents of ledge towards the “rear” of the proposed lot, it is assumed that development of Lot B would be focused on the “front” of the lot closest to Barra Road. For the stormwater models, we have assumed that future development of Lot B would be in watershed SC-1I, as that area includes the frontage along Barra Road.

2. The treatment calculations indicate that there will be no treatment for the developed area in SC-1J. However, this area is tributary to SF 3. This should be clarified.

Response: The watersheds have been revised to better demonstrate what is captured by the soil filter, with a new subcatchment SC-1K now shown for the areas around the periphery of the soil filter that will not run directly into it.

3. Although the entire area of SC-1J (19,433 s.f.) is included in the model for the peak rates of runoff, and will be routed to SF-3, only 4,961 s.f. is include in the soil filter sizing calculations.

Response: Calculations for the soil filter have been updated to now include undeveloped wooded areas. These have been included at a 50% rate in conformance with Maine DEP chapter 500.

4. Although the entire area of SC-2D (11,870 s.f.) is included in the model for the peak rates of runoff, and will be routed to SF-2, only 1,919 s.f. is include in the soil filter sizing calculations.

Response: Calculations for the soil filter have been updated to now account for undeveloped wooded areas. These have been included at a 50% rate in conformance with Maine DEP chapter 500.

5. The soil filter storage calculations appear to indicate that the filter material will have a 40% void ratio. Given the specifications for this material, that will not be the case.

Response: This has been revised to 20% void ratios in discussions with the City of Biddeford Engineering Staff.

6. The post-construction I and M plan should include the requirements for inspecting the soil filter.

Response: The I&M plan does refer to requirements of inspecting the soil filter per section 1.6 of the manual, and as detailed in Appendix C of the manual.

Drawings

1. Sheets 4 and 5 – Plan/Profile drawings

- a. Will the existing portion of Barra Road be paved at the same time the proposed portion is paved?

Response: Barra Road is first being proposed to be extended with construction of the 60 Barra Road project. This first extension will be paved this summer to approximately station 204+35, but is not related to the project that is being proposed here. The 60 Barra Road project is following its own permitting track, and development of this section was approved by DEP and the City of Biddeford.

- b. What is the intent/purpose of note 3?

Response: Note 3 is included as required per the City's checklist. We believe the intent is to minimize erosion and sedimentation within existing areas of pavement if trenching is required.

- c. The city checklist requires that a 25 year hydraulic grade line be shown for the storm drains. The plans for the soil filters indicate that stormwater will back up into the stormdrain line from the soil filters. This has the potential to cause issues during winter months, and reducing the storm drain capacity during freeze thaw cycles, particularly with the slow drawdown of the soil filters.

Response: The inlet elevations to the soil filters have been revised to be at the water quality level as a minimum, or at the spillway elevation where feasible to avoid this conflict.

- d. Snow storage areas are shown behind the guardrail at the end of the roads. We suggest that the guardrail be located 20 ft off the edge of pavement to provide adequate space for snow storage.

Response: In discussions with the city, the plans have been revised to show the hammerhead areas providing a minimum of 70' from the edge of pavement across the hammerhead to the end of pavement within the hammerhead. As part of these changes, the plans also now show a 13' wide area between the guardrails and the edge of pavement to allow for snow storage and terminus of utility stubs.

- e. Is wood guardrail acceptable to the city?

Response: This was discussed with City staff and they found these to be acceptable.

- f. Given the slope below the outlet of the 18" stormdrain at sta 205+50 of Barra Road, we recommend that a properly sized level spreader be installed below the outlet.

Response: A 12' long level spreader is now shown below the 18" stormdrain outlet.

- g. Several catch basins are specified as Type F basins. Are these acceptable to the city? Is the city equipped to maintain the Type F basins?

Response: This was discussed with the City, and their preference is to have 4' diameter structures. Details and call outs have been revised.

- h. Slopes steeper than 3H:1V require additional erosion protection. This should be specified on the drawings and the extent shown. A waiver of Article XI .Article II.5.B.1.e.3. is required for slopes steeper than 2H:1V and of Article VI, Section 26. F. for slopes steeper than 3:1.

Response: A waiver has been requested from these sections.

- i. A cross walk, tip downs, and ADA tactile warnings should be provided across Trailside Way at the intersection with Barra Road.

Response: These are now shown.

- j. Utilities should be extended to points beyond the edge of the new pavement.

Response: This is now included in the plans, per response to comment d. above.

- k. Why is the sewer not extended to the end of Barra Road?

Response: Force mains are now being extended to the limits of development along Barra Road and the hammerhead area along Tailside Way where Barra Road is proposed to be looped back into in the future. There are no future plans to extend Trailside Way east.

- l. Intersection radii (30 ft minimum) and centerline curve data should be shown.

Response: This is now shown on the plans.

- m. Sizes of utility services should be shown.

Response: This is now shown on the plans.

- n. Utility service valves should be shown on the right of way line.

Response: Utility service valves have been requested to be 6" within the ROW from the property lines. The plans are showing these service valves consistently in this manner.

- o. It seems utilities should be extended beyond the end of the tee at sta 302+55 of Trailside Way.

Response: Per comment k. above, the plans are now showing utility stubs where future expansion is currently contemplated.

- p. Provisions should be made for erosion protection at the end of the side street referenced above, or the pavement graded back toward Trailside Way.

Response: Catch basins are now proposed at the end of Trailside Way and its related turn around hammerhead area to reduce run off along the back side of the graded areas.

- q. Spot grades should be provided at the end of all roads and turnouts.

Response: Spot grades are now shown.

- r. Is the plan acceptable to the fire department.

Response: These plans have been discussed with the fire department, and revisions to the hammerhead turn around area geometry and the hydrant location have been made at their request.

2. Sheet 6 – Erosion Control Details

- a. The I and M plan for during construction should be included on this drawing.

Response: A note referring to the written I&M Plan is now shown on these plans.

3. Sheet 8 – Details A

- a. Minimum 2 ft deep sumps should be provided in the Type F basins. Two courses of brick or equivalent grade rings should also be noted.

Response: F-type basins have been eliminated from the proposed design, and all other catch basins propose a 2' deep sump.

- b. A force main cleanout manhole detail should be provided.

Response: A detail for the cleanout manhole is now shown.

- c. Road Typical Section

- Show sideslopes and erosion protection of the slopes.

Response: Typical section has been updated.

- We recommend 30" from the face of curb to the face of guardrail to allow for snow storage. Based on the detail provided there would be 4-5" available for snow storage.

Response: The guardrail detail has been updated to include this revision.

- Does this typical section match the typical section approved for Barra Road?
Response: This typical section shows a wider width of pavement than typical for a road of this type to provide future accommodations for bike paths, related to a possible future expansion of the Eastern Trail. This has been reviewed by the City previously and found to be satisfactory. A de minimis change was approved by the planning department for the 60 Barra Road project to revise the typical section of Barra Road extension in a similar manner, and will provide a consistent transition between projects.
 - A waiver of the travel way width required under the land use code for a major urban road may be necessary.
Response: The need for a waiver of this type was discussed with planning staff and it was decided that a wider width of pavement would not require a waiver, as it exceeds minimum requirements.
 - Tack coat should be shown between the base and surface paving.
Response: The detail has been updated to include this information.
 - The typical section should be revised to conform with the grading plans; i.e. ditch on the sidewalk side and ditch on the opposite side.
Response: The typical section has been updated to include this information.
 - The typical section reflects subbase gravel extending to daylight to provide subgrade drainage. The city should be consulted to verify this is acceptable, in lieu of underdrains. If acceptable, an underdrain would still be required from the east side of the end of Barra Road to Sta 301+75 of Trailside Way.
Response: This was discussed with Engineering staff and found to be acceptable. An underdrain is now being proposed along the east side of Trailside way to approximately station 302+00.
 - Specifications for fill material under the subbase gravel should be provided.
Response: This detail is now included, noted more specifically as common borrow.
- d. The pavement joint detail should include a shi lap joint.
Response: The pavement joint detail shows a 12” overlap shi lap joint between lifts of pavement, and is now noted as such.

4. Sheets 9 and 10 – Grassed Underdrained Soil Filter Details

- a. Provide embankment sections.
Response: Embankment sections now shown.

- b. The inspection requirements for the soil filter construction should include inspections when the liner is in place and prior to the back fill of the underdrains.
Response: Inspection notes have been updated.

- c. What will prevent water from flowing through 20" of riprap in the emergency spillway? A better option for preventing erosion may be a Turf Reinforcement Mat.
Response: Turf Reinforcement Mat is now proposed at the spillways.

- d. The elevations for the various storms should be shown in the typical sections, along with the water quality volume.
Response: Elevations are now shown on the plans.

- e. Riprap aprons should be shown at the ends of the outlet control structure outlet pipes.
Response: Aprons are now shown on the plans.

- f. The rim elevation for OCS 2 conflicts with the model.
Response: These have been revised to be consistent.

- g. The OCS 3 water quality inlet dimensions conflict with the plan/profile drawing but are consistent with the model.
Response: These have been revised to be consistent.

5. Turnaround

- There is no turnaround proposed at the end of Trailside Way. If this will become a public street, the nearest place to turn would be the future street to the north at a distance of approximately 130 ft. Has public works been consulted about how this would impact snow removal operations? Do they want plows backing 130 ft?
Response: We have discussed the turn around configuration with Fire, DPW and Engineering, and have made changes to be in conformance with the City's needs.

Sincerely,



Christopher MacDonald, PE
Cc Mike Eon – Indian Cliff Development Corp.

ATTACHMENT 3
MAINE WATER ABILITY TO SERVICE LETTER



June 7, 2024

ATTN: Christopher MacDonald, PE
BH2M
380B Main Street
Gorham, ME 04038

Re: Ability to Serve Determination – Barra Road Subdivision, Biddeford

Greetings,

The Maine Water Company (MWC) has received your request on the behalf of your client, Indian Cliff Development Corp., for an Ability to Serve Determination for the above-referenced subdivision. The request specifies a plan to construct a residential subdivision to include a 46-unit senior housing facility on Lot A, 7 duplexes (one per lot) on Lots B-G & J, and associated utility infrastructure improvements. Your client intends to extend water services from the existing main located in Barra Road. The expected domestic service demand is 9,000 gallons per day. The expected fire service demand is currently unknown.

Domestic water is available for your project from the existing 12-inch ductile iron main in the Barra Road Right-of-Way (ROW) to serve a main extension for the proposed development. Based on the criteria provided by the developer's agent, the expected increase in water usage is within the Biddeford Saco Division of MWC's available system capacity. The static pressure in the area is approximately **60 psi**. Additional infrastructure improvements may be required at the expense of the developer to meet the overall needs of this project.

Conditions of Service

- The development will require a public main extension to serve the proposed development. A utility sheet will be required to show utility placement and separation, including hydrants, services, valves, blow off assemblies, and other waterline appurtenances.
- MWC will require inspection during installation of the new public main and private service line connections at the expense of the developer.
- Additional plan approval, paperwork, and fees associated with services and main extensions in this area will require proper coordination with MWC. MWC requires upfront payment for inspection and paperwork to be fully completed before any construction on waterworks materials.
- Allow 30 days for the MWC utility review process to be completed before construction on waterworks materials will be approved.
- Proposed hydrants located in the public ROW must be accepted by the City of Biddeford and approved by the local fire authority.
- An easement for access and operation of all water service valves on this property must be signed, notarized, and registered with the county registry before activation. MWC will draft and supply this document to be executed by the owner.
- MWC has the understanding that fire service demand is unknown at this time, are not be included in this request, or accounted for in this Ability to Serve Determination.
- If fire services are required, a hydrant flow test at the nearest available hydrant will need to be conducted and analyzed by the sprinkler designer to ensure that adequate flows can be met during a peak fire demand event.
- The developer is required to pay for the cost of any modification, renewal of impacted service lines, and retirement of unused or discontinued services to MWC standards of best practice.
- Additional plan approval, paperwork, and fees associated with this project will require proper coordination with MWC. MWC requires upfront payment for inspection and paperwork to be fully completed before any construction on waterworks materials.
- Service lines must comply with MWC Cross Connection Control Program.

Should a request for service or completion of the project not be executed within one year of the date of this letter, MWC reserves the right to reevaluate its ability to serve this project.

All work must be completed in accordance with MWC Terms and Conditions as well as material specifications. All appropriate paperwork must be completed, and deposit paid prior to the start of construction. Please forward all design plan revisions as the project develops to prevent construction delays. Water service will be provided in accordance with Maine Public Utility Commission rules. If you have any additional questions, please do not hesitate to contact our office at 1-800-287-1643 or by email at Patrick.Gere@mainewater.com. We look forward to working with you throughout design and construction.

Sincerely,
The Maine Water Company


Patrick Gere, PE
Project Engineer

ATTACHMENT 4
UPDATED SEWER DESIGN REPORT

Pressure System Design Report For

Barra Rd Single and Duplex Lots

Biddeford, ME

June 27, 2024



Christopher MacDonald, P.E.
Civil Engineer
BH2M
380B Main Street
Gorham, Maine 04038
207 839-2771 x 203

June 27, 2024

RE: Barra Rd, Biddeford ME Single and Duplex Lots

Dear Christopher;

This preliminary design analysis examines the use of the E/One Pressure Sewer System for your project. E/One has over 50 years of installation and O&M experience along with considerable research and development leading to continuous product and system improvements. E/One remains the worldwide industry standard and industry leader in the pressure sewer technology. The unique characteristics of the E/One Pressure Sewer approach provides not only a technical solution, but also an economic advantage to be realized with low up front and O&M costs.

System Analysis

Based on the proposed plan, we are showing forty six (46) unit elderly affordable housing apartment, and seven (7) duplex residential lots. All proposed lots will than connect to a manhole located on Barra Rd. We broke this into two (2) reports, one showing if the seven (7) lots remained single lots, and the other showing if the became duplex. We labeled said reports as "Barra Rd- Biddeford ME Single lots" and "Barra Rd- Biddeford ME Duplex lots"

Using the information you provided, we ran the enclosed preliminary pressure sewer pipe sizing analysis. This was run through our Low Pressure Sewer Design Software that employs our Flow Velocity and Friction Head Loss vs. Pumps in Simultaneous Operation Spreadsheet. We have used the surface topography provided to make our analyses.

Zone Layout

Using your site plan we laid out a system of two (2) flow Zones leading to the final discharge point. Zone one (1) is showing the affordable housing unit and Zone two (2) shows the seven (7) duplex residential lots. Zone one (1) will be a 2 inch HDPE FM and Zone two (2) will be a 3 inch HDPE FM. FM is sized for future connections. In both reports the zones remain the same, the only change is we go from seven (7) pumps in zone 2 to fourteen (14) pumps, pipe size remains the same.

Computations are based on the Hazen-Williams formula for friction loss, using

calculations of cross-sectional area and flow rate to determine pipe sizes that create "self-cleaning" velocities of 2.0 fps or higher. A "C" factor of 150, SDR HDPE pipe and the average expected daily volumes for single family homes are also used in this analysis.

The highest Total Dynamic Head generated is approximately 26 feet with single lots and 32 feet with duplex lots which is predominately head conditions when the pressure sewer pumps operate with the lift station operating. This is well below our pump's continuous-run rating of 185 ft, and well within its intermittent, i.e., normal, operating range. Flow velocity throughout the system meets or exceeds 2 fps these characteristics and low retention time indicate that this will be a reliable, low-maintenance system.

Design Flows & System Velocity

We have used the design flows you provided.

The ADF of 6,000 gpd and commercial use would suggest that we use the DH502 duplex pump station rated to 6,000 gpd. For the residential could be met with our DH071 simplex station rated to 700 gpd. Again, due to the commercial nature of the application we have selected the DH502 station as is shown in the budget portion of the report.

Appurtenances

Our normal recommendations for valve placement are as follows: flushing connections at 1,000' to 1,500' intervals and at branch ends and junctions; isolation valves at branch junctions; and air release valves at peaks of 25 ft or more and/or at intervals of 2,000 to 2,500 ft.

Common practice in pressure sewers requires the ability to isolate each lot with a corporation stop off the main and service lateral kit to the lot line. E/One has

developed a true wastewater rated check valve which is built in to our stainless steel lateral kit shown in this report. These components are rated to 235 psi and with standard connection fittings rated to 150 psi. These items are included in the budget analyses and shown in this report.

We strongly advise against the use of waterworks check valves as they are not rated for sewage environments. We do not like to recommend brass due to concerns for corrosion. **WEF Manual of Practice FD-12, Second Edition**, page 45 speaks to the limited success of brass or bronze alloys.

“Besides corrosion considerations, brass is subject to de-alloying, while some bronze, such as 85-5-5, will give better performance. The terms *brass* and *bronze* are used loosely, despite having different meanings; the engineer is advised to evaluate these materials with caution.”

We have also seen PVC body check valves with pressure rating to 150 psi that do not have the same rating for back pressure on the check valve. This can result in damage to the check valve and pumping issues as the check valve disc can become dislodged under pressure and then become a line obstruction. Connections to the main pressure line do not require WYE type fittings. We commonly use a TEE or saddle connection. We isolate each connection to the main line with a stainless steel corporation valve in the same manner used for other utilities such as gas and water services.

System Monitoring

We also include in this package information regarding the Sentry monitoring system for Environment One stations. This system allows the owners to monitor run times, pump starts and stops and running conditions such as amp draw, etc. This system can be monitored from a secure web access and will provide the ability to pre-empt service issues before they become emergencies.

Budget Notes

We can formally quote this when the project comes closer.



water supply and pollution control equipment



273 Weymouth Street, Rockland, MA 02370
tel. 781-982-9300 • fax. 781-982-1056
www.frmahony.com • www.amphidrome.com
info@frmahony.com

Costs of pipeline excavation and pump installation are best obtained from sources in your region. You may be better able to determine these costs. I am looking forward to working with you on this and future projects. Please contact me if you have any questions or require additional information.

Best regards,

Daryl Coppola

Outside Sales Engineer

781-820-5808

dcoppola@frmahony.com

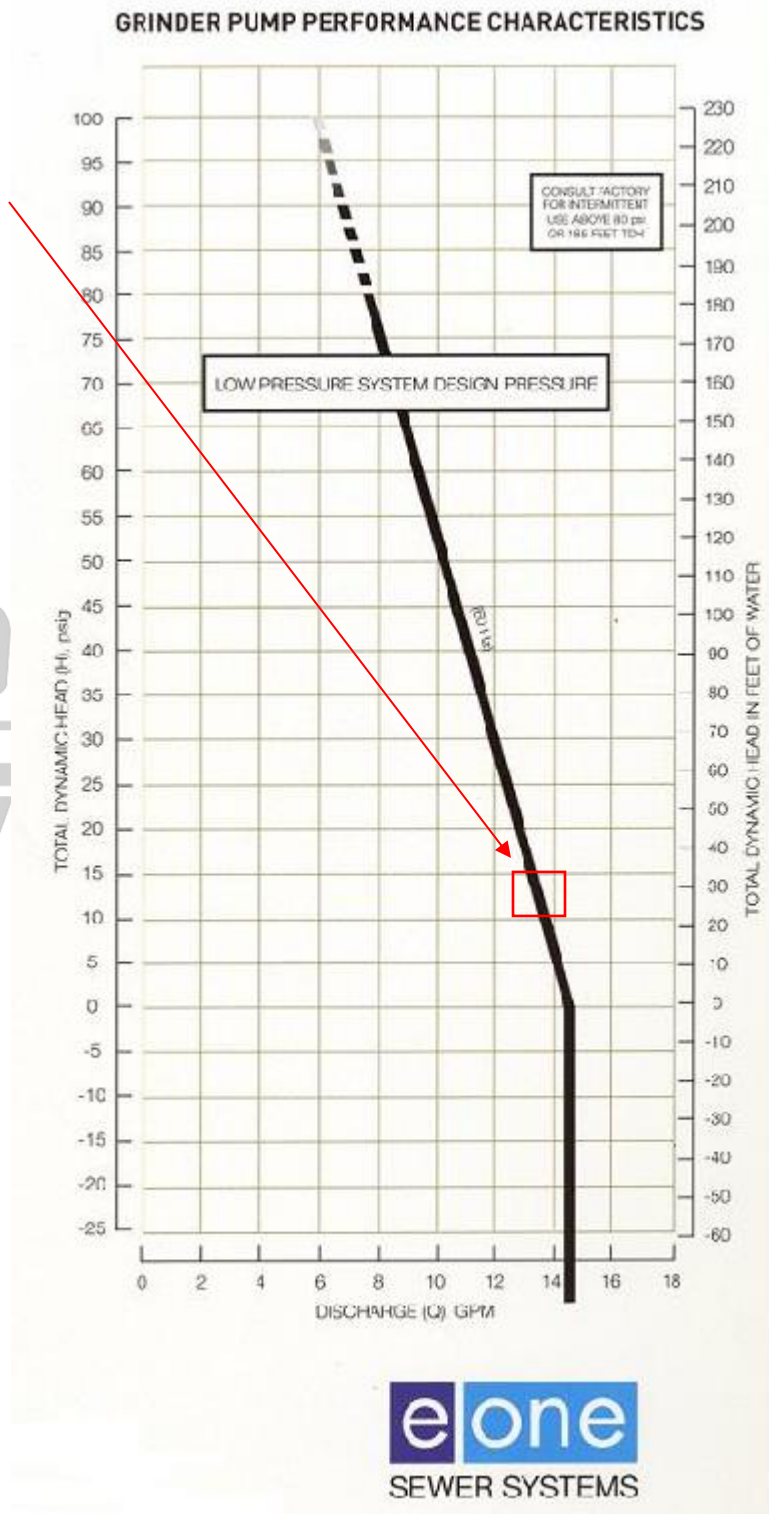


Operation Conditions

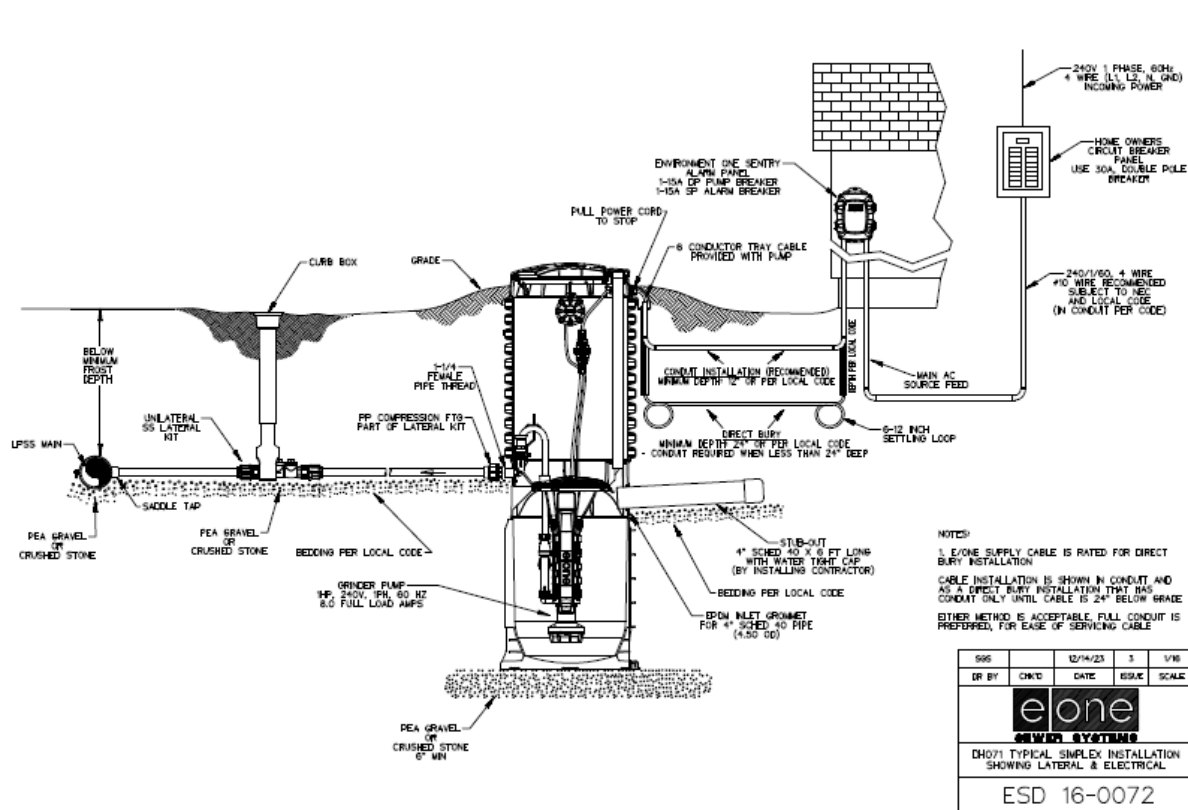
26.94 and 32.15 TDH at simultaneous operating conditions with the expected number of pumps operating in each zone, or the head of an individual pump operating in a single zone condition.

Operating range of E/One pumps from 0-185 feet TDH and from 0 to -60 feet TDH.

Anti-siphon valves in E/One cores provide for negative head pumping. In common systems with negative heads of 25-30 feet or more we recommend the use of combination air/vacuum release valves as described below.



This image shows the typical layout of an outdoor pump unit for single-family home use. This layout will be very similar to the duplex layout. All piping for inlets and discharge will have the same orientation as shown above. The pump unit is furnished complete, ready for installation. The installer needs to confirm the power cord length and discharge and inlet configuration. Standard products are supplied with 32 foot power supply cable. Standard inlets are 4-inch Schedule 40 Grommets (@ zero degrees) with 1-1/4 inch discharge (@ 180 degrees). Other configurations are available.



Lateral Connections

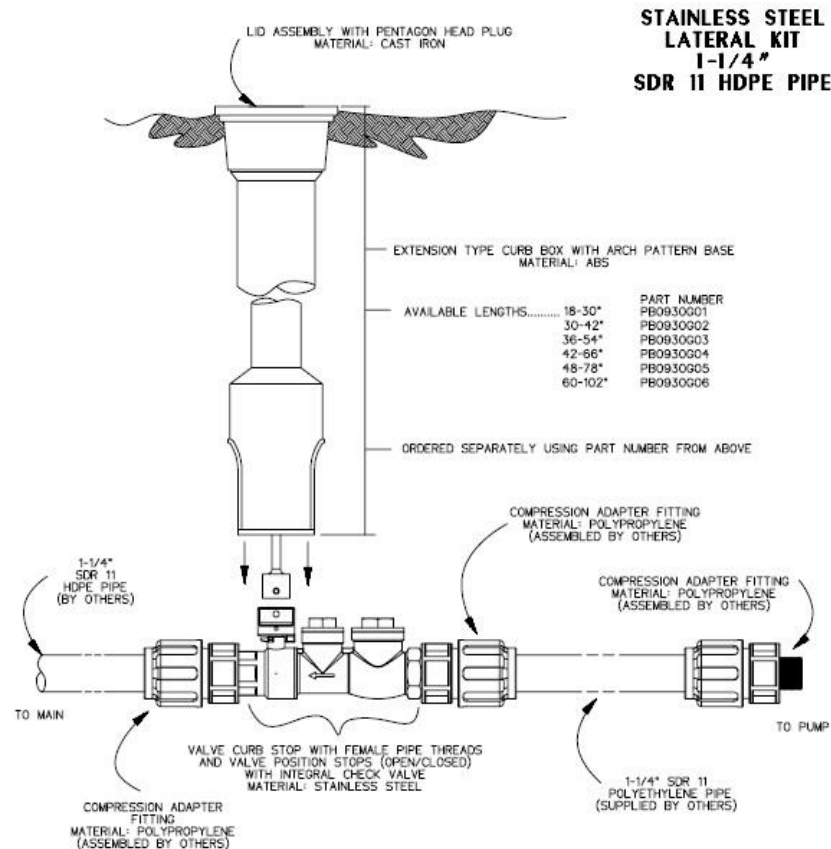


Pressure Sewer System pumps must be isolated from the common mainline with a corporation stop and curb stop lateral kit.

The lateral kit will have a full port ball valve and full port redundant check valve. Check valves shall be rated for 150 psi minimum system operating pressure including system back pressure.

Components are to be corrosion resistant Stainless Steel with Corrosion resistant PVC, Polypropylene or HDPE materials.

REME
S E R I E S



NOTES:

1. SS CURB STOP/CHECK VALVE AND FITTINGS ARE PROVIDED SEPARATELY, TO BE ASSEMBLED BY OTHERS
2. TO ASSEMBLE, APPLY A DOUBLE LAYER OF TEFLON TAPE, AND A LAYER OF PIPE DOPE (SUPPLIED BY OTHERS) TO THE THREADS ON THE PLASTIC FITTINGS AND INSTALL PER THE MANUFACTURER'S INSTRUCTIONS
3. ASSEMBLY IS TO BE PRESSURE TESTED (BY OTHERS)
4. ASSEMBLY IS TO BE USED WITH SDR11 HDPE PIPE
5. TO ORDER SS LATERAL KIT, USE PART NUMBER NC0193001
6. CURB BOX IS TO BE ORDERED SEPARATELY, SEE ABOVE

KIT PARTS ARE NOT ASSEMBLED

SGS	DN	11/02/11	A	3/16
DR BY	CHK'D	DATE	ISSUE	SCALE
eone SEWER SYSTEMS STAINLESS STEEL LATERAL KIT 1-1/4" SDR 11 HDPE PIPE NA0330P02				

SERVICE OPERATIONS

**9 Town Forest Rd
Oxford, MA 01540**

D: (508) 765-0051

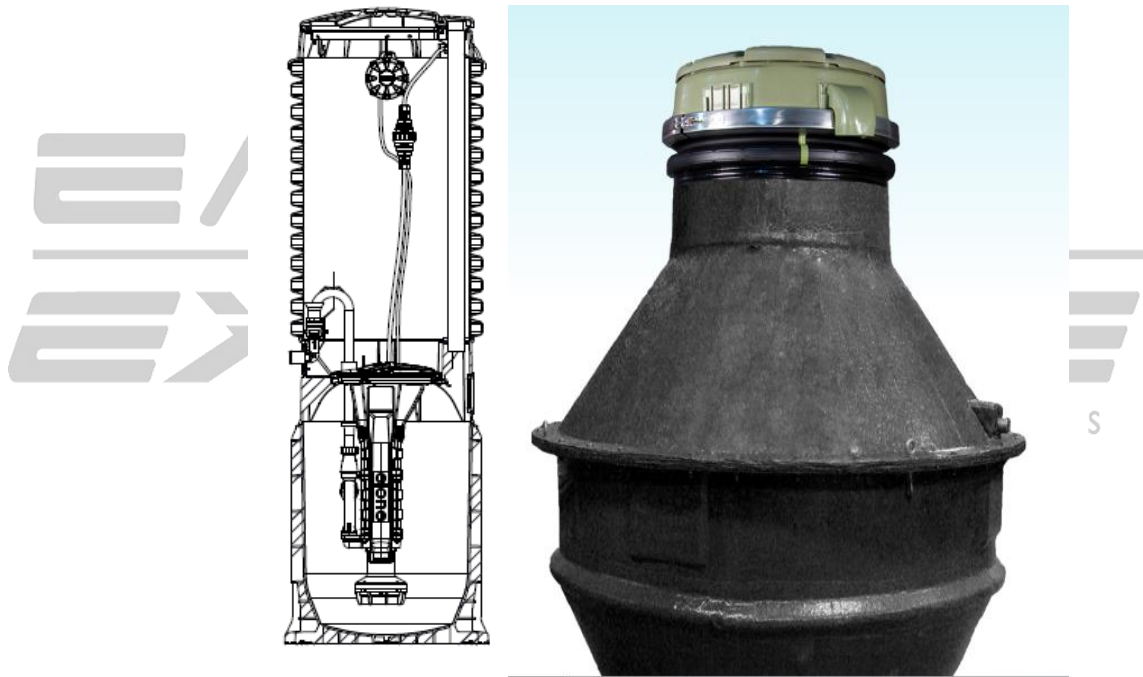
We recommend Pump Model DH502-104 for the 45 unit building. The station height can be adjusted to meet variable inlet elevations with 6 inch and 2 foot extensions. Stations and riser sections can be adjusted in heights in 4-inch increments. These stations are UL listed NSF and CSA certified.

Model DH071-93 Outdoor Pump

Station is rated to flows up to 700 gpd

Model DH502-104 Outdoor Pump

Station is rated to flows up to 6,000 gpd



Other station configurations are available for higher flow requirements. Please contact us for more information. Additional information may be found at www.eone.com



Standard alarm panels are the Sentry® panel mounted outside of the home as shown in the drawing (above).

Options include emergency (see photo) and Redundant panel shown. Other panel available. See the partial listing



generator connection alarm Remote Sentry® configurations are of panel options below.

- Basic Panels include circuit breaker for the pump and separate breaker for the alarm. These panels include alarm light, alarm buzzer and alarm silence button. **All F. R. Mahony panels are equipped with dry contacts to enable the connection of the Remote Sentry® (battery powered redundant alarm panel option)**
- Standard options include auto transfer generator connection shown above. This panel provides automatic power transfer without having to open the alarm panel or having to operate any manual transfer switching. This feature can be added to the basic panel or the panels offered below.
- Popular options include the **“Protection Package”** which monitors and protects the system from:
 - Pump Run Dry Condition (Pump running out of water)
 - Pump Overpressure Condition (Closed valve)
 - Brownout Condition (Main voltage under 12% of nameplate)
 - High Liquid Level
- The **“Protect Plus”** panel features offer the same items in the “Protection Package” plus the following:
 - High & Low Amperage draw by the pump
 - High & Low voltage to the pump
 - Extended Runtime by the pump (indicating wear or excessive flow) (field adjustable settings)
 - Monitoring of:
 - Real-time Pump Voltage and Current
 - Cycles & Hours (can be reset)
 - Minimum & Maximum Amperage (can be reset)
 - Minimum, Maximum, Average, and Last Run Cycle (in minutes, can be reset)

The Sentry Duplex Protect Plus panel is an Environment One full-featured Alarm/Monitor panel. The Sentry Duplex Protect Plus panel monitors for the following operating conditions:

- Pump Run Dry Condition – Pump running out of water
- Pump Overpressure Condition – Pump operating at abnormally high wattage level
- Brownout Condition – Mains voltage under 12% of nameplate rating
- Overvoltage Condition – Mains voltage above 12% of nameplate rating
- High Liquid Level Real-time,
- High, and Low Voltage to the Pump Real-time,
- High, and Low Wattage drawn by the Pump
- Extended Pump Runtime (field programmable limit)

The Sentry Duplex Protect-Plus Panel displays pump status, operating parameters, and user options by means of the following indicators: LCD Display to show Pump & Panel operating conditions Four Status Indicators:

- Ready (Green LED)
- Pump Running (Green LED)
- Trouble (Amber LED)
- High Level Alarm (Red LED)

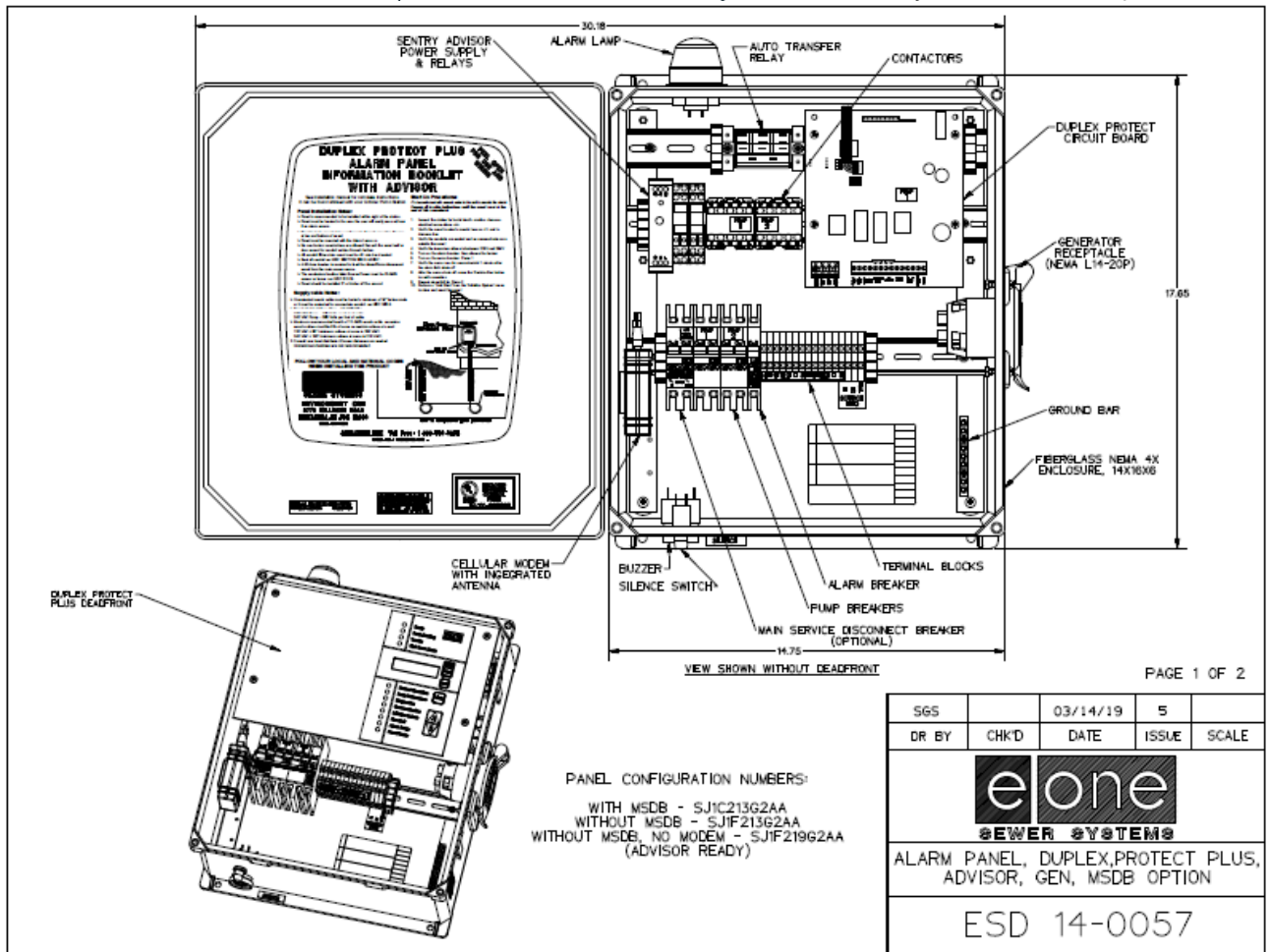
Eight Selectable Modes to view or change panel operation Menu Navigation Buttons – Enter, Scroll, Mode, ↑ ‘A’ and ↓ ‘B’



Standard Features

- Corrosion-proof fiberglass enclosure
 - NEMA 4X rated enclosure
- Lockable latch with padlock
 - Circuit breakers
- Terminal blocks & ground lugs
 - Dry Contacts
- Lead/Lag indicator lights
 - Alarm indicator lights
 - Run indicator lights
 - Manual Push-to-Run

Panel options, Emergency Generator transfer switch and remote power inlet.





water supply and pollution control equipment

Environment One Sentry Advisor System Monitoring

A Division Of



273 Weymouth Street, Rockland, MA 02370
tel. 781-982-9300 • fax. 781-982-1056
www.frmahony.com • www.amphidrome.com
info@frmahony.com

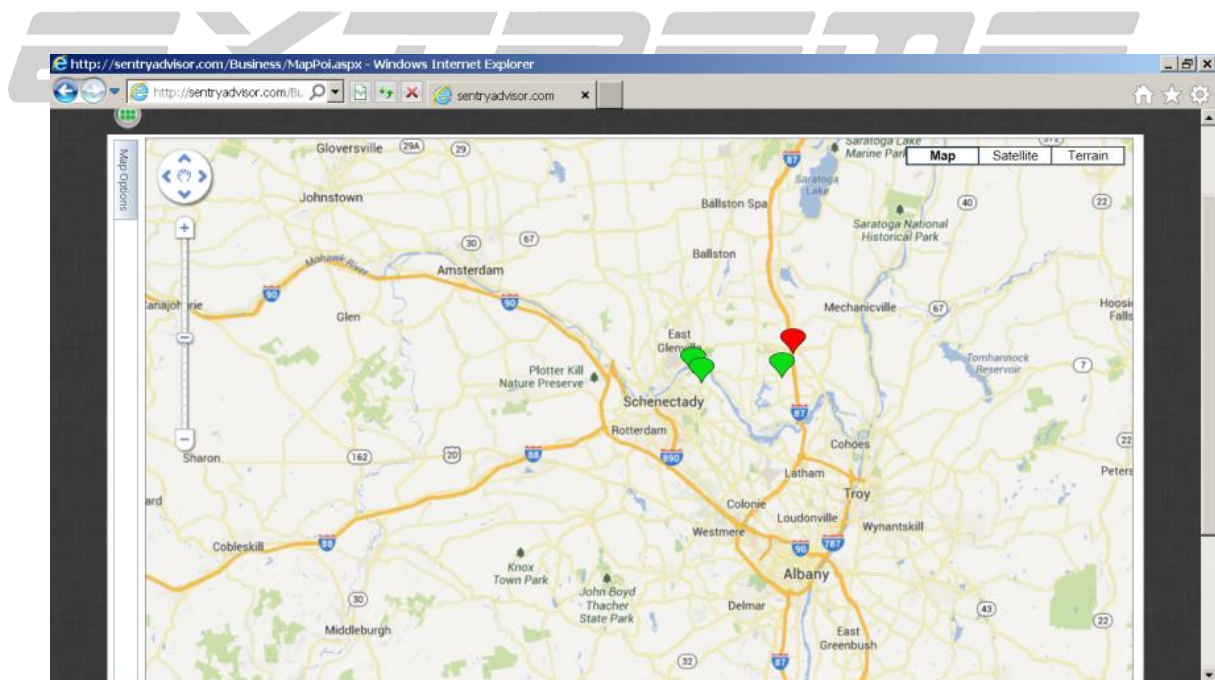
E/One Sentry Advisor offers a new level of sewer system monitoring and protection — and can even predict service needs. Let E/One Sentry Advisor monitor your system and help reduce the number of emergency service call-outs and eliminate unnecessary overtime.

E/One Sentry Advisor monitors pump performance and records every start, run time duration and stop of each grinder pump on the system. Alarm conditions can be sent automatically to service personnel. Use reports to review system performance and spot data trends such as frequent alarms or unusually long run times.

The online mapping feature shows the location of each grinder pump in the system, whether there are a few stations or hundreds.

The modem in the alarm panel transmits pump run and alarm data. The web interface can be configured to send alarm notices via SMS text, phone or e-mail to multiple contacts. Data is stored online and can be used to generate system performance reports and help identify pending service needs.

System mapping can be used for quick overview of operating conditions.



SERVICE OPERATIONS

**9 Town Forest Rd
Oxford, MA 01540**

D: (508) 765-0051

Standard Package

- Includes all necessary components and wiring — cellular modem, antenna, auxiliary power supply, and dry contacts for both high level alarm and pump running
- High level alarm
- Run time meters (daily, cumulative, last run, minimum/maximum/average)
- Cycle counters (daily and cumulative)
- Extended run time alerts (cycle, daily, etc.)
- Generate pump run and/or alarm event reports
- Map the location of each grinder pump in the system
- Battery back-up for power loss notification

EXTREME

Optional Features (Protect Plus Panels only)

- Brownout and over-voltage alerts
- Run dry and over-pressure alerts
- Volts, amps, watts historical information
- Volts, amps, watts related alerts
- Detailed system status
- Visibility or system settings and user defined options
- Board-level fault indications (DIP switch, watt meter, alarm circuit protection)

All Components fit neatly inside the Sentry Panel. Reporting is through web based access with voice, text, and email alerts of critical events.



SENTRY ADVISOR BASIC SENTRY SIMPLEX

REMOTE MONITORING OF:

- HIGH LEVEL ALARM
- PUMP RUNNING

WEB INTERFACE PROVIDES:

- RUN TIME HISTORY
 - DAILY, CUMULATIVE, LAST, MIN., MAX., AVG.
- CYCLE HISTORY
 - DAILY, CUMULATIVE
- EXTENDED RUN TIME ALERTS
 - CYCLE, DAILY
- GENERATE PUMP RUN AND/OR ALARM EVENT REPORTS
- MAP LOCATION OF EACH GRINDER PUMP IN THE SYSTEM WITH STATUS INDICATION

BACKUP BATTERY FOR POWER LOSS NOTIFICATION

USES EXISTING BOARD ALARM DRY CONTACTS

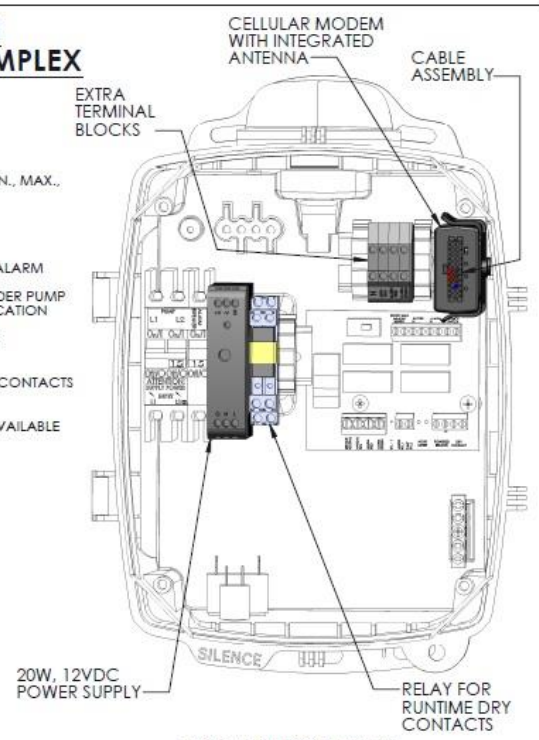
FACTORY INSTALLED, RETROFIT, OR STANDALONE CONFIGURATIONS AVAILABLE

OPERATING TEMPERATURE RANGE:
-20C TO +70C

INPUT VOLTAGE:
85 - 264VAC

MODEM CONTAINS:

- 2 AUXILIARY A-D INPUTS
- 3 AUXILIARY DIGITAL OUTPUTS



CELLULAR MODEM WITH INTEGRATED ANTENNA

CABLE ASSEMBLY

EXTRA TERMINAL BLOCKS

20W, 12VDC POWER SUPPLY

RELAY FOR RUNTIME DRY CONTACTS

SILENCE

TYPICAL SENTRY PANEL IN SENTRY ENCLOSURE, SHOWN FOR REF. ENCLOSURE DOOR NOT SHOWN

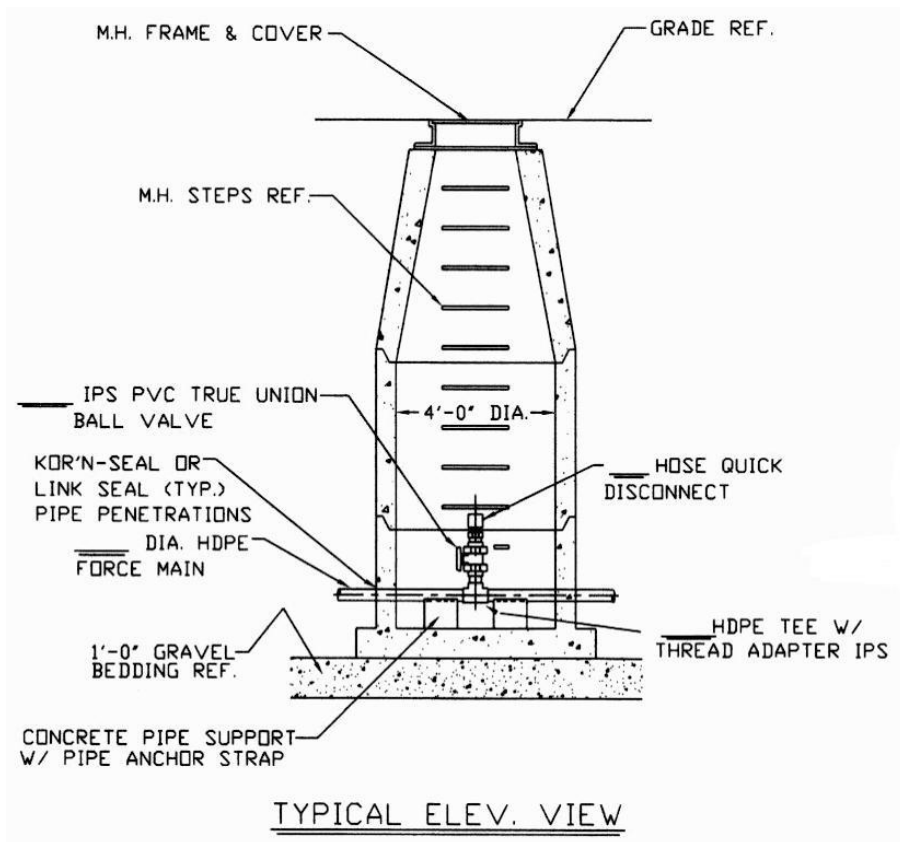
BF	11/08/2013	CTT	-	11/11/2013
DR BY	DATE	CHK'D	ISSUE	DATE


 ENVIRONMENT ONE CORPORATION
 CUT SHEET, ADVISOR, BASIC SENTRY
 240V, 2P
NA0440P02



Typical Cleanout Detail (Optional Air/Vacuum Valve shown –right)

Cleanout detail can be modified to match typical installation needs. Inline shut offs may be added to isolate flow direction. Image shown is flow through cleanout. These structures can be terminal end of line cleanouts, or junction cleanouts as may be required. Optional air and vacuum relief valves may be added when required.





Environment One Corporation

Pressure Sewer Preliminary

Cost and Design Analysis

For

Barra Rd- Biddeford ME Duplex Lots

Prepared For:

Christopher MacDonald, P.E. BH2M Engineers

380B Main Street

Gorham

Maine 04038

Tel: 207 839-2771 x 203

Fax:

Prepared By: D.Coppola

June 27, 2024

Barra Rd- Biddeford ME Duplex Lots

Prepared by : D.Coppola

On: June 27, 2024

Notes :

This report is showing the proposed Avesta properties and if we made the 7 lots duplex lots

<<<<< END OF NOTES >>>>>

PRELIMINARY PRESSURE SEWER - PIPE SIZING AND BRANCH ANALYSIS

Barra Rd- Biddeford ME Duplex Lots

Prepared By:

D.Coppola

June 27, 2024

Zone Number	Connects to Zone	Number of Pumps in Zone	Accum Pumps in Zone	Gals/day per Pump	Max Flow Per Pump (gpm)	Max Sim Ops	Max Flow (GPM)	Pipe Size (inches)	Max Velocity (FPS)	Length of Main this Zone	Friction Loss Factor (ft/100 ft)	Friction Loss This Zone	Accum Fric Loss (feet)	Max Main Elevation	Minimum Pump Elevation	Static Head (feet)	Total Dynamic Head (ft)
This spreadsheet was calculated using pipe diameters for:						SDR11HDPE	Friction loss calculations were based on a Constant for inside roughness "C" of:										150
1.00	2.00	2	2	6000	14.76	2	29.52	2.00	3.19	115.00	2.05	2.36	15.87	125.00	125.00	0.00	15.87
2.00	2.00	14	16	200	14.65	4	58.64	3.00	2.92	1,221.00	1.11	13.51	13.51	115.00	96.00	19.00	32.51

PRELIMINARY PRESSURE SEWER - ACCUMULATED RETENTION TIME (HR)

Barra Rd- Biddeford ME Duplex Lots

Prepared By:

D.Coppola

June 27, 2024

Zone Number	Connects to Zone	Accumulated Total of Pumps this Zone	Pipe Size (inches)	Gallons per 100 lineal feet	Length of Zone	Capacity of Zone	Average Daily Flow	Average Fluid Changes per Day	Average Retention Time (Hr)	Accumulated Retention Time (Hr)
This spreadsheet was calculated using pipe diameters for: SDR11HDPE								Gals per Day per Dwelling		200
1.00	2.00	2	2.00	15.40	115.00	17.71	12,000	677.46	0.04	0.70
2.00	2.00	16	3.00	33.47	1,221.00	408.63	14,800	36.22	0.65	0.66



Environment One Corporation

Pressure Sewer Preliminary

Cost and Design Analysis

For

Barra Rd- Biddeford ME Simplex Lots

Prepared For:

Christopher MacDonald, P.E. BH2M Engineers

380B Main Street

Gorham

Maine 04038

Tel: 207 839-2771 x 203

Fax:

Prepared By: D.Coppola

June 27, 2024

Barra Rd- Biddeford ME Simplex Lots

Prepared by : D.Coppola

On: June 27, 2024

Notes :

This report is showing the proposed Avesta properties and for 7 single family lots

<<<<< END OF NOTES >>>>>

PRELIMINARY PRESSURE SEWER - PIPE SIZING AND BRANCH ANALYSIS

Prepared By:

D.Coppola

Barra Rd- Biddeford ME Simplex Lots

June 27, 2024

Zone Number	Connects to Zone	Number of Pumps in Zone	Accum Pumps in Zone	Gals/day per Pump	Max Flow Per Pump (gpm)	Max Sim Ops	Max Flow (GPM)	Pipe Size (inches)	Max Velocity (FPS)	Length of Main this Zone	Friction Loss Factor (ft/100 ft)	Friction Loss This Zone	Accum Fric Loss (feet)	Max Main Elevation	Minimum Pump Elevation	Static Head (feet)	Total Dynamic Head (ft)
This spreadsheet was calculated using pipe diameters for SDR11HDPE								Friction loss calculations were based on a Constant for inside roughness "C" of: 50									
1.00	2.00	2	2	6000	14.76	2	29.52	2.00	3.19	115.00	2.05	2.36	10.30	125.00	125.00	0.00	10.30
2.00	2.00	7	9	200	14.65	3	44.01	3.00	2.19	1,221.00	0.65	7.94	7.94	115.00	96.00	19.00	26.94

PRELIMINARY PRESSURE SEWER - ACCUMULATED RETENTION TIME (HR)

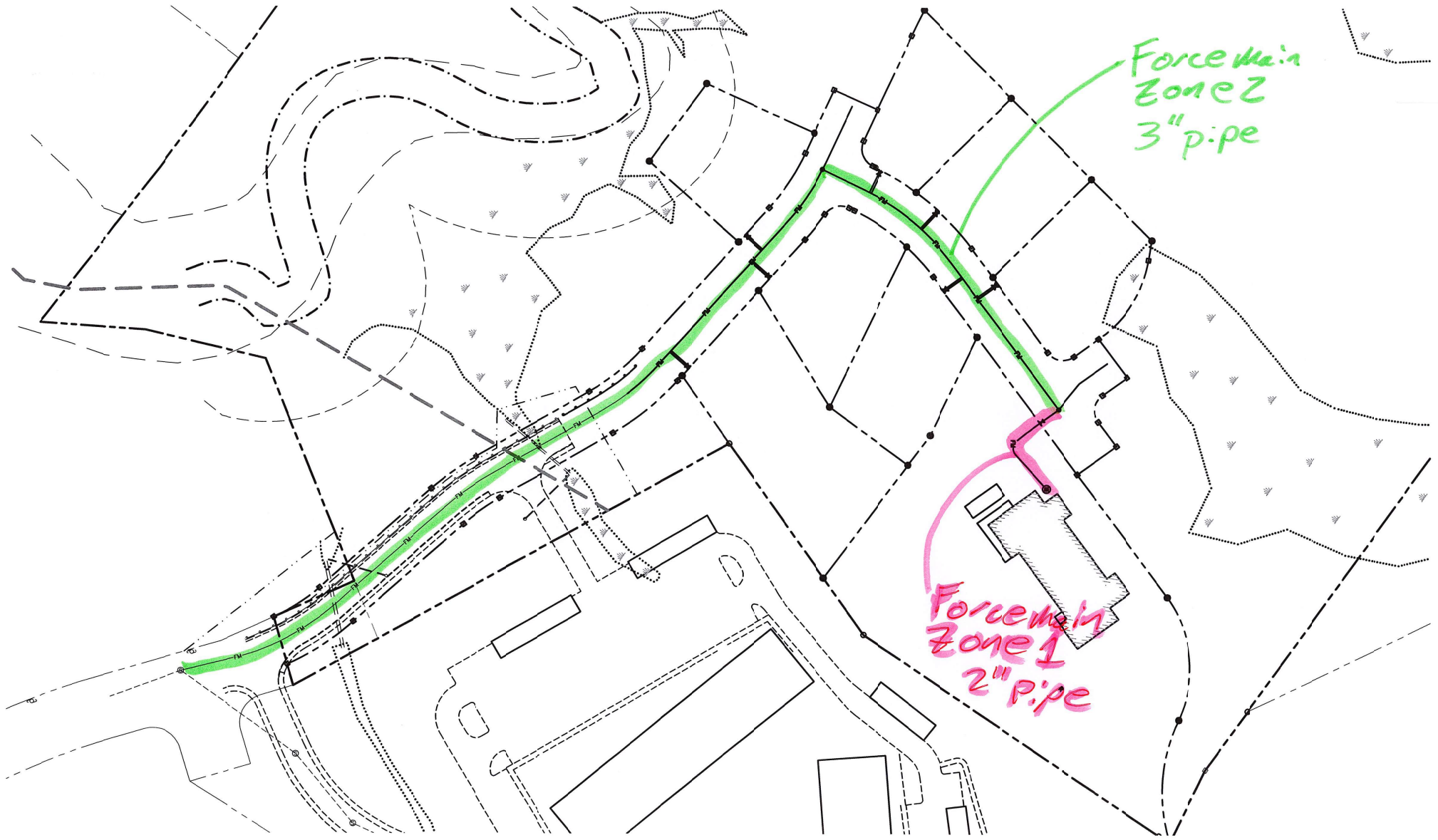
Barra Rd- Biddeford ME Simplex Lots

Prepared By:

D.Coppola

June 27, 2024

Zone Number	Connects to Zone	Accumulated Total of Pumps this Zone	Pipe Size (inches)	Gallons per 100 lineal feet	Length of Zone	Capacity of Zone	Average Daily Flow	Average Fluid Changes per Day	Average Retention Time (Hr)	Accumulated Retention Time (Hr)
This spreadsheet was calculated using pipe diameters for: SDR11HDPE				Gals per Day per Dwelling					200	
1.00	2.00	2	2.00	15.40	115.00	17.71	12,000	677.46	0.04	0.77
2.00	2.00	9	3.00	33.47	1,221.00	408.63	13,400	32.79	0.73	0.73



ATTACHMENT 5
CITY COST ESTIMATE WORKSHEET

City of Biddeford, Maine

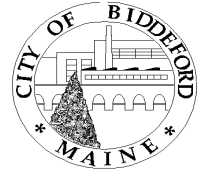
COST ESTIMATE WORKSHEET

OWNER/APPLICANT: Indian Cliff Development Corp.

PB #: 2024.21

PROJECT NAME: Barra Road Subdivision

DATE: 7/17/2024



	ITEM	UNIT	QUANTITY	UNIT COST	TOTAL
1	Clearing and Grubbing	Acre	1.62	\$6,000.00	\$9,720.00
2	Erosion/Sediment Control	Lump Sum	1	\$10,000.00	\$10,000.00
3	Site Stabilization	Lump Sum	1	\$5,000.00	\$5,000.00
4	Ledge Removal	Cubic Yard	500	\$60.00	\$30,000.00
5	Sanitary Sewer				
	Manholes	Each	2	\$7,500.00	\$15,000.00
	Main	Linear Foot	667	\$37.00	\$24,679.00
	House Services	Linear Foot	350	\$30.00	\$10,500.00
6	Water Main				
	Main	Linear Foot	861	\$60.00	\$51,660.00
	House Services	Linear Foot	350	\$37.00	\$12,950.00
	Hydrants	Each	1	\$5,000.00	\$5,000.00
7	Electric				
	Underground Utility Trench	Linear Foot	340	\$30.00	\$10,200.00
	Conduit/Wiring	Linear Foot	340	\$30.00	\$10,200.00
	Transformer Bases	Each	2	\$2,500.00	\$5,000.00
8	Storm Drainage				
	Pipe/Culvert	Linear Foot	530	\$60.00	\$31,800.00
	Catch Basin	Each	12	\$7,500.00	\$90,000.00
	Other Treatment Devices	Each	2	\$18,000.00	\$36,000.00
9	Stormwater Management				
	Outlet Control Structure	Each			\$0.00
	Stromwater Management Facilities	Each			\$0.00
10	Excavate and Grade Subgrade	Cubic Yard	2057	\$20.00	\$41,135.56
11	Roadways				
	Subbase Gravel	Cubic Yard	1442	\$30.00	\$43,250.00
	Base/Finish Gravel	Cubic Yard	320	\$38.00	\$12,161.90
	Base Paving	Ton	312	\$120.00	\$37,476.99
	Finish Paving	Ton	196	\$120.00	\$23,479.56
	Geotextile Fabric	Ton			\$0.00
12	Sidewalks				
	Subbase Gravel	Cubic Yard			\$0.00
	Base/Finish Gravel	Cubic Yard	122	\$38.00	\$4,648.67
	Base Paving	Ton	156	\$120.00	\$18,738.50
	Finish Paving	Ton	156	\$120.00	\$18,738.50
13	Parking Lots/Other Areas				
	Subbase Gravel	Cubic Yard			\$0.00
	Base/Finish Gravel	Cubic Yard			\$0.00
	Base Paving	Ton			\$0.00
	Finish Paving	Ton			\$0.00

City of Biddeford, Maine

COST ESTIMATE WORKSHEET

14	Curbing – Bituminous	Linear Foot	1820	\$15.00	\$27,300.00
15	Curbing - Concrete				
15	Curbing – Granite	Linear Foot			\$0.00
16	Pavement Striping	Linear Foot	150	\$5.00	\$750.00
17	Guardrail	Linear Foot	125	\$120.00	\$15,000.00
18	Fencing	Linear Foot			\$0.00
19	Loam and Seed	1,000 Square Feet	42	\$400.00	\$16,789.60
20	Riprap	Cubic Yard			\$0.00
21	Landscaping	Lump Sum			\$0.00
22	Street Lights	Each	2	\$1,000.00	\$2,000.00
23	Site Lighting	Each			\$0.00
24	Monuments/Iron Pipes	Lump Sum	1	\$12,000.00	\$12,000.00
25	Clean Up	Lump Sum	1	\$5,000.00	\$5,000.00
26	As Builts	Lump Sum	1	\$10,000.00	\$10,000.00
27	Other				\$0.00
28	Other				\$0.00
29	Other				\$0.00
30	Other				\$0.00
31	Other				\$0.00

COST ESTIMATE TOTAL:

\$646,178.26

150% of TOTAL:

\$969,267.39

FOR OFFICE USE ONLY

EROSION CONTROL/SITE STABILIZATION BOND (IF APPLICABLE):

PERFORMANCE GUARANTEE REQUIRED:

Name:

Signature:

Date:

ATTACHMENT 6
UPDATED STORMWATER MANAGEMENT REPORT

STORMWATER MANAGEMENT REPORT

BARRA ROAD SUBDIVISION

**Barra Road
Biddeford, Maine**

Submitted by:

**Indian Cliff Development Corp.
260 Main Street
P.O. Box 444
Biddeford, ME**

And

**Avesta Housing
307 Cumberland Avenue
Portland, ME**

Prepared by:



Date:
July 2024

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APPENDIX G	MAINE DEP STORMWATER APPLICATION CHECKLIST

1.0 INTRODUCTION

Indian Cliff Development Corporation is proposing to permit a 9 lot subdivision known as Barra Road Subdivision (the Subdivision project). The project is proposed to subdivide an approximate 7 acre portion of a larger parcel, approximately 56 acres, off of the current end of Barra Road in Biddeford, ME, known as Map 7 lot 15. The subdivision proposes to construct 2 new roads to service the subdivision, one being an extension of Barra Road, and the second being Trailside Way. The subdivision will include 7 residential lots, Lots B-G and J, meeting bulk and space standards for 2-unit duplex homes that will be offered for sale and development by others at a future time. The larger approximate 2.2-acre lot, Lot A, is proposed to be developed Avesta Housing to develop a 46-unit elderly affordable housing project (the Site project), consisting of a 4-story building, and associated parking and amenities. An additional lot, Lot H, is proposed as a non-buildable lot proposed for stormwater and site access to an abutting property. These projects are required to obtain a City of Biddeford Subdivision permit for Indian Cliff Development's 9-lot subdivision, and a City of Biddeford Site and Subdivision permit for Avesta Housing's 46-unit affordable housing project. These projects will also jointly file for a required Stormwater Law Permit from the Maine DEP.

The scope of work for these projects includes but is not limited to:

- Tree clearing and grubbing
- Stump and boulder removal
- Construction of 27' wide paved roadways with a 5' sidewalk
- Extension of municipal services and associated service connection stubs
- Installation of underground electric and communications conduit and transformer pads
- Installation of storm drain system including catch basins, storm drain culverts, and vegetated swales.
- Construction of Grassed Underdrained Soil Filters
- Construction of proposed 46-unit affordable elderly housing building and associated utilities, parking, and stormwater management facilities.

The Stormwater Management Plan has been prepared to satisfy the requirements of the Maine Department of Environmental Protections "Stormwater Management Rules" Chapters 500, 501 and 502, the most recent version of the "Maine Stormwater Best Management Practices Manual", and the City of Biddeford's Stormwater Ordinance.

1.1 **OVERVIEW OF MODELING METHODOGY AND SOURCE INFORMATION**

Hydrologic Analysis: The pre and post development conditions have been modeled using modeling software (Hydrocad Version 10) which is based upon the methodology contained within the USDA Soil Conservation Service Technical Release 55. Type III 24-hour storm distributions for York County were used for the analysis. The following return periods and 24-hour rainfall depths were used for the analysis:

Return Period	24-Hour Rainfall Depth
2-Year Storm	3.30 inches
10-Year Storm	4.90 inches
25-Year Storm	6.20 inches

Soils: The soils used for the stormwater analysis were digitized from the Natural Resource Conservation Service (NRCS), web soil survey website. The source of the data is the Cumberland County Soil Survey (Class D). Refer to the following for additional documentation regarding the soils used for modelling:

- Appendix A of this Report
- Pre and Post Development Watershed Plans (Sheets A and B)

The onsite soils include:

Soil Map Unit	Unit Description	Hydrologic Soil Group
BuC	Buxton silt loam, 8-15% slopes	C
LyB	Lyman-Rock outcrop complex, 3-8% slopes	D
LyC	Lyman-Rock outcrop complex, 8-15% slopes	D
Sc	Scantic silt loam, 0-3% slopes	D

Topography: Ground Survey by BH2M and LIDAR data from the NOAA LiDAR Digital Coast Dataset

Natural Resources: Wetland delineations performed by Mark Hampton Associates

1.2 **DESCRIPTION OF POINTS OF ANALYSIS**

The watershed model analyzes the discharge of runoff at five Analysis Points as described below:

Analysis Point #1

Description: Culmination of flow along Thatcher Brook.

Pre Development Tributary Drainage Areas: 7.84 Acres

Post Development Tributary Drainage Areas: 7.96 Acres

Analysis Point #2

Description: Point flow to wetland along south eastern property line.

Pre Development Tributary Drainage Areas: 6.66 Acres

Post Development Tributary Drainage Areas: 6.95 Acres

Analysis Point #3

Description: Culmination of flow to low point at south western property line.

Pre Development Tributary Drainage Areas: 1.16 Acres

Post Development Tributary Drainage Areas: 0.75 Acres

1.3 PRE DEVELOPMENT CONDITIONS

The Existing Conditions are shown on Sheet 2 and Sheet A of the accompanying plans. The portion parcel to be developed encompasses an area of approximately 7 acres and is located on Barra Road in Biddeford. The parcel is mostly wooded and lies within the Thatcher Brook Watershed.

The watershed that was analyzed for this project is approximately 15.7 acres. The analysis points are described in Section 1.2 of this report. The watershed generally flows from a ridgeline central to the project and runs primary south, east and west. The project is bounded by woodland areas to the east and north, a residential apartment complex currently under construction to the south, and Thatcher Brook to the west.

The Pre-Development Watershed Map is included as Sheet A of the accompanying plans and the Calculations are attached as Appendix B.

The Pre-Development Watershed Model predicts the following peak flow rates:

Pre-Development Peak Flows (cu. ft./sec)			
Analysis Point	2-Year	10-Year	25-Year
AP-1	7.20	15.25	22.36
AP-2	6.10	12.15	17.39
AP-3	1.00	2.23	3.32

1.4 POST DEVELOPMENT CONDITIONS

The overall projects propose construction of the Subdivision by Indian Cliff Development and the proposed Site project by Avesta Housing. The Subdivision will

include construction of 27' wide paved roadways and 5' sidewalk intended to meet City of Biddeford standards, along above ground and underground municipal services for water, sewer, drainage specific to the Subdivision project, gas, and electric and data to support the development of the 9 new lots. The 7 duplex lots proposed by Indian Cliff Development for this subdivision are proposed to be developed by others at a later date, and service connections will be stubbed in at the time of the construction of the extension of Barra Road and Trailside Way.

Avesta Housing proposes to develop a 2.2 acre parcel as a 46-unit affordable elderly housing development as soon as development of the Subdivision and funding sources will allow. This will include the building, parking lot, connections to municipal utilities installed for the Subdivision project, and stormwater systems specific to the Site project.

For the Subdivision project, it should be noted that the 7 duplex lots proposed for future development by others have been included in the stormwater models assuming 1,000 sf per unit for driveways, or 2,000 sf per lot, and 3000 sf per lot for the duplex homes. While these assumptions are being provided in the stormwater run off models, these are not carried forward in the treatment calculations presented in the General Standards, section 1.6 of this report, as these lots are not proposed to be developed with the initial development of the Subdivision. The below is a summary of the proposed developed areas associated with construction of the public infrastructure associated with development of the Subdivision roads, and assumed duplex home lot development.

Proposed Impervious Area (Subdivision Roadways)	=	28,802 sf
Proposed Landscaped Area	=	41,974 sf
<u>Assumed Duplex Lot Development (treatment not required)</u>	=	<u>35,000 sf</u>
Proposed and Assumed Developed Area Subdivision	=	105,776 sf

Avesta Housing is proposing to develop the 46-unit affordable elderly housing project in conjunction of the initial development of the subdivision. The details of the developed areas for the Site project are summarized below.

Proposed Impervious Area (Site project Development)	=	37,192 sf
<u>Proposed Landscaped Area</u>	=	<u>40,839 sf</u>
Proposed Developed Area Avesta Site	=	78,031 sf

The projects will include Grassed Underdrained Soil Filters to provide treatment and attenuation of peak flows.

While the Subdivision and Site projects are proposed to be developed and permitted by separate entities, given the timing of development and interrelated impacts to the overall watersheds, it is best to review peak flows of their combined effects.

The Post Development Watershed Map is included as Sheet B of the accompanying plan set and the Calculations are attached as Appendix C.

The Post-Development Watershed Model predicts the following peak flow rates:

Post Development Peak Flows (cu. ft./sec)			
Analysis Point	2-Year	10-Year	25-Year
AP-1	7.34	15.28	22.08
AP-2	5.65	11.45	16.57
AP-3	0.61	1.35	2.02

1.5 **BASIC STANDARDS**

The proposed projects are required to meet the Basic Standards for the Maine DEP. To meet the Basic Standards the project designs must demonstrate that the erosion and sedimentation control, inspection and maintenance, and housekeeping standards specified in Appendices A, B, and C of 06-096 Chapter 500 (Maine DEP) are met, and that the grading or other construction activity will not impede or otherwise alter drainageways so as to have an unreasonable adverse impact on a wetland or waterbody, or an adjacent downslope parcel.

The proposed projects will provide temporary (during construction) BMP's and post-construction BMP's. Refer to Erosion Control Plans for each project's plan set plans for erosion and sedimentation control narratives and details. The project requirements for inspection and maintenance during construction and post-construction are described in the Erosion and Sedimentation Control - Inspection and Maintenance Plans found in Appendix E for the Subdivision and Appendix F for the Site project of this Report. The housekeeping standards can also be found in the respective Inspection and Maintenance Plans.

1.6 **GENERAL STANDARDS**

The proposed project is required to meet the General Standards. To meet the general standards, the project design must demonstrate that the stormwater management system includes treatment measures that will provide pollutant removal or treatment and mitigate for the increased frequency and duration of channel erosive flows due to runoff from smaller storms and potential temperature impacts. This must be achieved by providing treatment of no less than 95% of the impervious area and no less than 80% of the developed area. For linear portions of projects, the treatment requirements can be reduced to no less than 75% of the impervious area and no less than 50% of the developed area (See 06-096 Chapter 500 4.C(5)(c)). For development of these projects, we have assumed that the Subdivision portions of the project will meet the 75% linear exemption criteria, and the Site portion of the project will meet the 95% criteria.

The stormwater management system includes individual Grassed Underdrained Soil Filters for both roads of the Subdivision and an additional Grassed Underdrained Soil Filter for the Site project. The proposed soil filters have been designed in accordance with the design requirements outlined in the Maine Stormwater Best Management Practices Manual, Volume III, Chapter 7.1.

Below is a summary of the treatment areas associated with the proposed infrastructure. Refer to Appendix D for detailed calculations.

Stormwater Treatment Summary Indian Cliff Subdivision (Linear Project)	
Total Proposed (Linear) Impervious Area	28,802 sf
Total Proposed (Linear) Developed Area	70,776 sf
Total Treated (Linear) Impervious Area	27,325 sf
Total Treated (Linear) Developed Area	40,375 sf
Linear Subdivision Impervious Area Treatment %	94.9% (75% required)
Linear Subdivision Developed Area Treatment %	57.0% (50% required)

Stormwater Treatment Summary Avesta Site	
Total Proposed Impervious Area	37,192 sf
Total Proposed Developed Area	78,031 sf
Total Treated Impervious Area	37,192 sf
Total Treated Developed Area	64,152 sf
Impervious Area Treatment %	100.0% (95% required)
Developed Area Treatment %	82.2% (80% required)

As shown in the Table above, the stormwater management systems have been designed to meet the applicable General Standard requirements for both the Subdivision and Site projects. Detailed treatment calculations can be found in Appendix D.

1.7 **PHOSPHORUS STANDARD**

The proposed project is located in the watershed of Thatcher Brook. The proposed project is not located within the direct watershed of a lake or lake most-at-risk listed in 06-096 Chapter 502. The Phosphorus Standard does not apply to this project.

1.8 **URBAN IMPAIRED STREAM STANDARD**

The proposed project is located in the watershed of Thatcher Brook. The Thatcher Brook is listed in 06-096 Chapter 502 as an Urban Impaired Stream, however, as the projects have been assessed by Maine DEP as a Stormwater Law project and not subject to Site Location of Development permitting, the full Maine DEP Urban Impaired Stream Standard does not apply to the project.

However, as the project is being proposed in the City of Biddeford, the City does require that the projects within an Urban Impaired Stream Watershed pay into the Compensation Fee Utilization Plan (CFUP) managed by the City at Maine DEP's prescribed rates, based on Table 1 found in 06-096 CMR 501 3.A.(1). Where there are two distinct projects being proposed and permitted, there are two sets of impact fees that will need to be assessed:

CFUP Fee Schedule – Indian Cliff Development Subdivision Project			
Type of Surface	Compensation Fee (per acre)	Proposed Area (acres)	Compensation Fee
Non-roof Impervious Area	\$12,500	0.66	\$8,250
Roof	\$5,000	N/A	\$N/A
Landscape Area	\$2,500	0.96	\$2,400
Total			\$10,650

CFUP Fee Schedule – Avesta Site Project			
Type of Surface	Compensation Fee (per acre)	Proposed Area (acres)	Compensation Fee
Non-roof Impervious Area	\$12,500	0.60	\$7,500
Roof	\$5,000	0.25	\$1,250
Landscape Area	\$2,500	0.94	\$2,350
Total			\$11,100

1.9 **FLOODING STANDARD**

The proposed project is required to meet the Flooding Standards for the City of Biddeford. To meet the Flooding Standard, the project design must demonstrate that the stormwater management systems will accomplish the following:

- a) The system must detain, retain, or result in the infiltration of stormwater from 24-hour storms of the 2-year, 10-year, and 25-year frequencies such that the peak flows of stormwater from the project site do not exceed the peak flows of stormwater prior to undertaking the project.
- b) The design of piped or open channel systems must be based on a 25-year, 24-hour storm without overloading or flooding beyond channel limits.
- c) The areas expected to be flooded by runoff from a 10-year or 25-year, 24-hour storm must be defined, and no buildings or other similar facilities may be planned within such areas.
- d) Runoff from the project may not flood the primary access road to the project and any public roads bordering the project as a result of a 25-year, 24-hour storm.

Given the combined development of these projects, both the Subdivision and Site projects flooding criteria have been developed in a single model, but as a note, this model was broken between AP-1 and AP-2&3 due to node size limitations. The following table compares the Pre and Post Development peak flow rates for the 2-year, 10-year, and 25-year return periods. Refer to Appendix B for the Pre-Development model and Appendix C for Post Development model.

Peak Flow Comparison (cu. ft./sec)						
Analysis Point	2-Year		10-Year		25-Year	
	Pre	Post	Pre	Post	Pre	Post
AP-1	7.20	7.34	15.25	15.28	22.36	22.08
AP-2	6.10	5.65	12.15	11.45	17.39	16.57
AP-3	1.00	0.61	2.23	1.35	3.32	2.02

As illustrated in the table above, development of the proposed project will create a condition where most of the post development peak rates of runoff are decreased from the pre development peak rates of runoff for events for both the Subdivision and Site projects.

The models do suggest, however, that a slight increase in run off is predicted for AP-1 during only the 2 year and 10 year events in post-construction conditions. These very minor increases, 0.14 cfs for the 2-year and 0.03 cfs increase for the 10-year events are both less than a 2% increase in their respective modeled storm events over existing conditions. Reviewing the results, these increases are mostly driven due to assumed development of duplex house lots in post-development watershed SA-1 where the project cannot provide practical storage. Also considering AP 1 and 2 both flow directly to the Thatcher Brook watershed, reviewing the combined effects of these show a net reduction of run off to the river. Given the minor nature of these increase specifically at AP 1, that this is based on assumed future development, and the fact that this run off will go directly to Thatcher Brook with a net reduction, we do not expect downstream effects or flooding concerns. The projects request that waivers be granted by the City of Biddeford and Maine DEP as deemed necessary for these minor increases in run off.

Given these results, no adverse impacts will be created to the downstream conditions as a result of this development.

1.10 CLOSURE

The proposed stormwater management facilities have been designed to mitigate stormwater impacts associated with development of the proposed to meet the City of Biddeford Subdivision and Site permit requirements, as well as applicable sections of Chapter 500, 501 and 502 for Stormwater Law permit requirements.

Appendix A
Soils Reports

Appendix B
Pre Development Calculations

Appendix C
Post Development Calculations

Appendix D
Water Quality Calculations and BMP Sizing

Appendix G
Maine DEP Stormwater Application Checklist

Appendix A
Soils Reports



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for York County, Maine

Barra Road Development



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

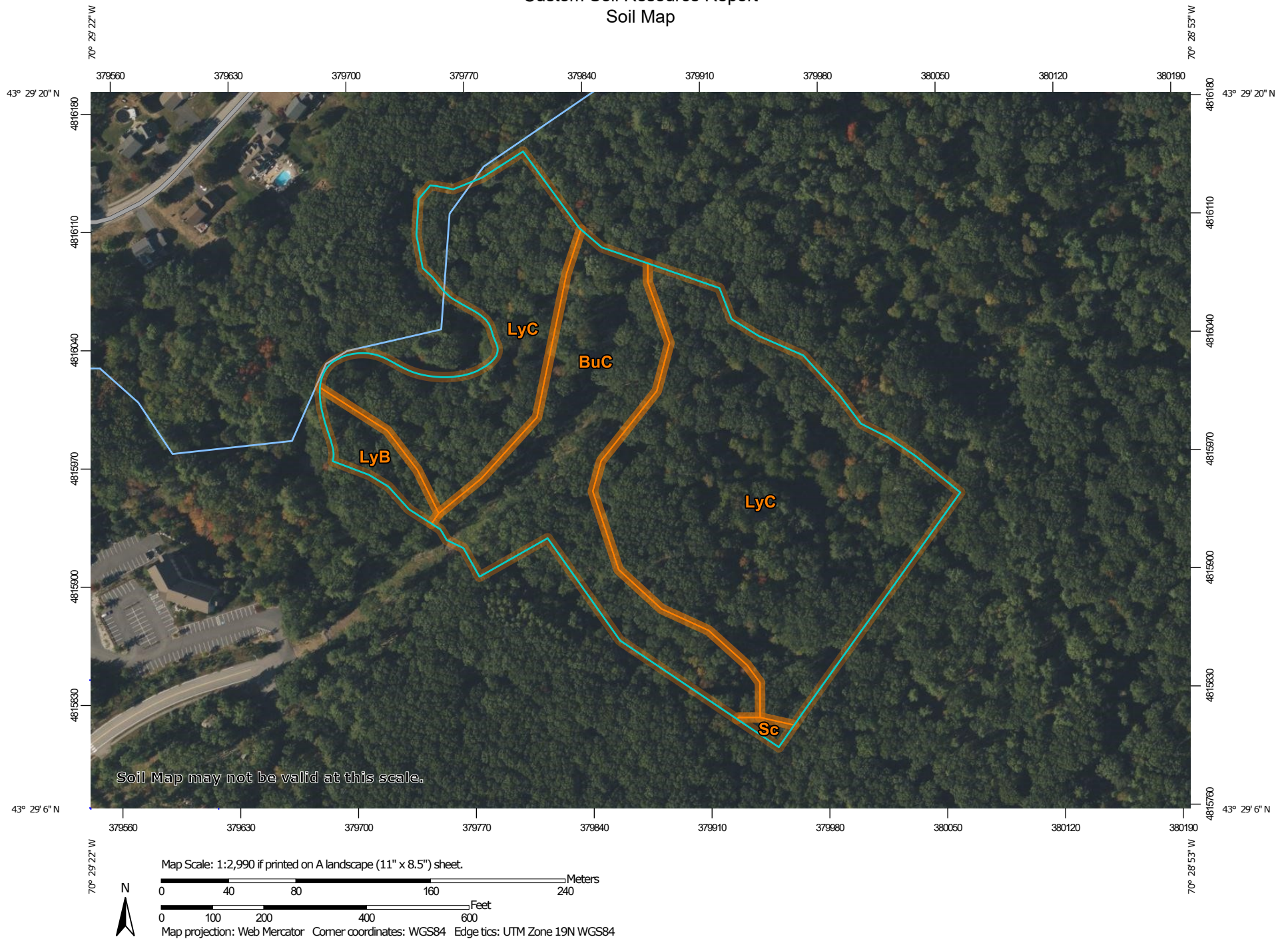
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: York County, Maine
Survey Area Data: Version 22, Sep 5, 2023

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

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BuC	Buxton silt loam, 8 to 15 percent slopes	4.0	25.7%
LyB	Lyman-Rock outcrop complex, 3 to 8 percent slopes	0.5	3.2%
LyC	Lyman-Rock outcrop complex, 8 to 15 percent slopes	11.1	70.6%
Sc	Scantic silt loam, 0 to 3 percent slopes	0.1	0.4%
Totals for Area of Interest		15.7	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

York County, Maine

BuC—Buxton silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9k55

Elevation: 10 to 900 feet

Mean annual precipitation: 34 to 48 inches

Mean annual air temperature: 43 to 46 degrees F

Frost-free period: 90 to 160 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Buxton and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Buxton

Setting

Landform: Coastal plains

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Glaciolacustrine deposits derived from siltstone and/or fine-silty marine deposits

Typical profile

H1 - 0 to 7 inches: silt loam

H2 - 7 to 19 inches: silt loam

H3 - 19 to 37 inches: silty clay

H4 - 37 to 65 inches: silty clay

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Depth to water table: About 18 to 30 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Hydric soil rating: No

LyB—Lyman-Rock outcrop complex, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2trqh

Elevation: 0 to 560 feet

Mean annual precipitation: 36 to 65 inches

Mean annual air temperature: 36 to 52 degrees F

Frost-free period: 60 to 160 days

Farmland classification: Not prime farmland

Map Unit Composition

Lyman, very stony, and similar soils: 65 percent

Rock outcrop: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lyman, Very Stony

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountaintop, mountainbase, side slope, crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 3 inches: loam

E - 3 to 5 inches: fine sandy loam

Bhs - 5 to 7 inches: loam

Bs1 - 7 to 11 inches: loam

Bs2 - 11 to 18 inches: channery loam

R - 18 to 28 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent

Surface area covered with cobbles, stones or boulders: 1.5 percent

Depth to restrictive feature: 11 to 24 inches to lithic bedrock

Drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.03 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

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Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountaintop, mountainbase, side slope, crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Igneous and metamorphic rock

Typical profile

R - 0 to 10 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: 0 inches to lithic bedrock

Capacity of the most limiting layer to transmit water (Ksat): Very low to very high (0.00 to 14.17 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydric soil rating: Unranked

LyC—Lyman-Rock outcrop complex, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2trqj

Elevation: 0 to 790 feet

Mean annual precipitation: 36 to 65 inches

Mean annual air temperature: 36 to 52 degrees F

Frost-free period: 60 to 160 days

Farmland classification: Not prime farmland

Map Unit Composition

Lyman, very stony, and similar soils: 62 percent

Rock outcrop: 25 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lyman, Very Stony

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountaintop, mountainbase, side slope, crest

Custom Soil Resource Report

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 3 inches: loam

E - 3 to 5 inches: fine sandy loam

Bhs - 5 to 7 inches: loam

Bs1 - 7 to 11 inches: loam

Bs2 - 11 to 18 inches: channery loam

R - 18 to 28 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent

Surface area covered with cobbles, stones or boulders: 1.5 percent

Depth to restrictive feature: 11 to 24 inches to lithic bedrock

Drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.03 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Ecological site: F144BY701ME - Shallow Till

Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountaintop, mountainbase, side slope, crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Igneous and metamorphic rock

Typical profile

R - 0 to 10 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: 0 inches to lithic bedrock

Capacity of the most limiting layer to transmit water (Ksat): Very low to very high (0.00 to 14.17 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Ecological site: F144BY801ME - Rockland (reserved)

Hydric soil rating: Unranked

Sc—Scantic silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2slv3

Elevation: 10 to 900 feet

Mean annual precipitation: 33 to 60 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 160 days

Farmland classification: Not prime farmland

Map Unit Composition

Scantic and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scantic

Setting

Landform: River valleys, marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Glaciomarine deposits

Typical profile

Ap - 0 to 9 inches: silt loam

Bg1 - 9 to 16 inches: silty clay loam

Bg2 - 16 to 29 inches: silty clay

Cg - 29 to 65 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: About 0 to 12 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: D

Ecological site: F144BY304ME - Wet Clay Flat

Hydric soil rating: Yes

References

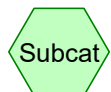
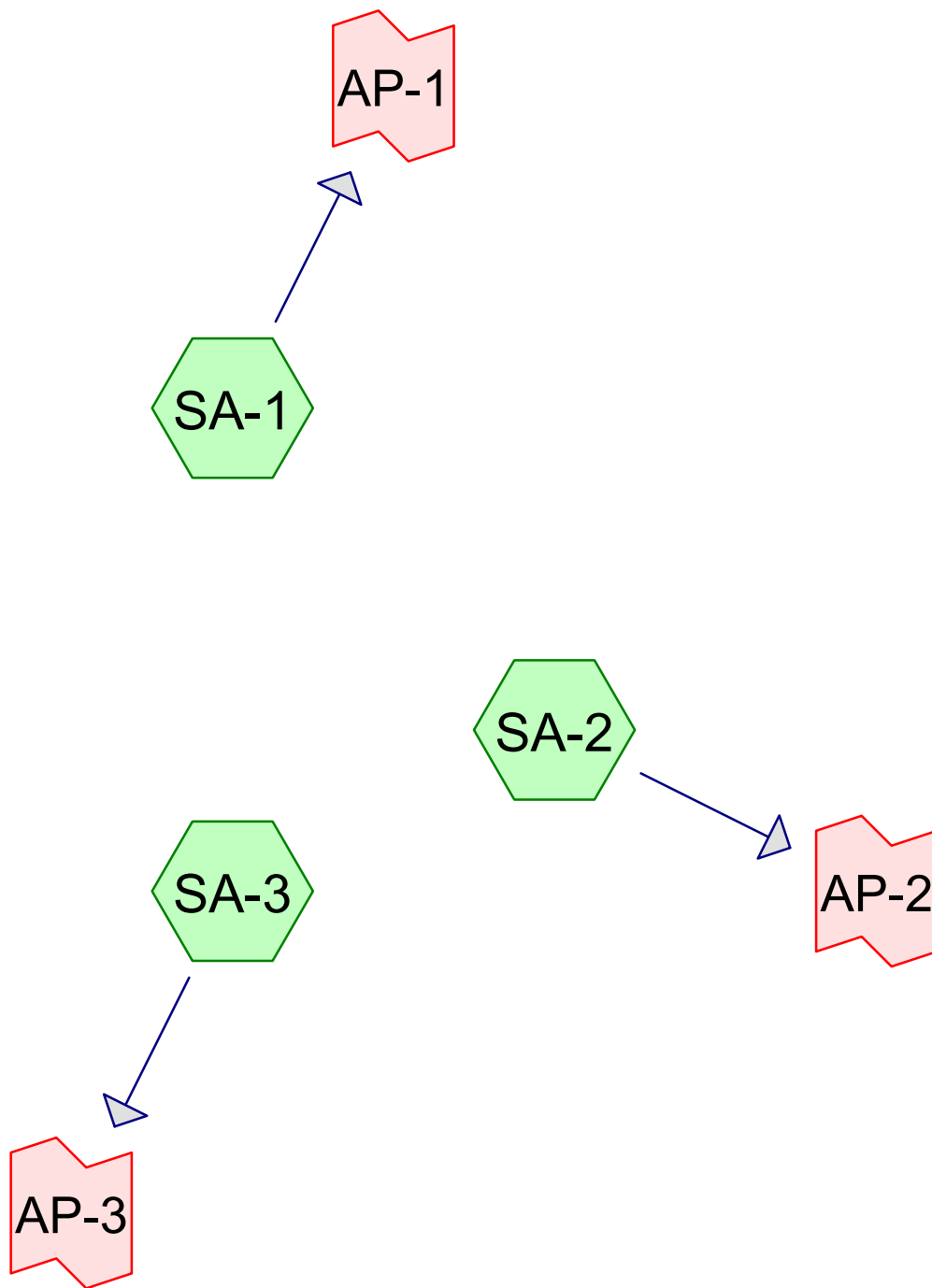
- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. September 18, 2002. Hydric soils of the United States.
- Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
- National Research Council. 1995. Wetlands: Characteristics and boundaries.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580
- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

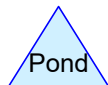
Appendix B
Pre Development Calculations



Subcat



Reach



Pond



Link

Routing Diagram for Pre-Development
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Pre-Development

Prepared by BH2M

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Type III 24-hr 25-YR Rainfall=6.20"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-1: Runoff Area=341,483 sf 0.00% Impervious Runoff Depth>3.21"
Flow Length=446' Tc=17.8 min CN=75 Runoff=22.36 cfs 2.096 af

Subcatchment SA-2: Runoff Area=290,295 sf 0.00% Impervious Runoff Depth>3.49"
Flow Length=660' Tc=26.9 min CN=78 Runoff=17.39 cfs 1.939 af

Subcatchment SA-3: Runoff Area=50,383 sf 0.00% Impervious Runoff Depth>3.02"
Flow Length=150' Slope=0.1067 '/' Tc=15.0 min CN=73 Runoff=3.32 cfs 0.291 af

Link AP-1: Inflow=22.36 cfs 2.096 af
Primary=22.36 cfs 2.096 af

Link AP-2: Inflow=17.39 cfs 1.939 af
Primary=17.39 cfs 1.939 af

Link AP-3: Inflow=3.32 cfs 0.291 af
Primary=3.32 cfs 0.291 af

Total Runoff Area = 15.660 ac Runoff Volume = 4.326 af Average Runoff Depth = 3.31"
100.00% Pervious = 15.660 ac 0.00% Impervious = 0.000 ac

Pre-Development

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Type III 24-hr 25-YR Rainfall=6.20"

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Summary for Subcatchment SA-1:

Runoff = 22.36 cfs @ 12.25 hrs, Volume= 2.096 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
115,270	70	Woods, Good, HSG C
17,262	77	Woods, Poor, HSG C
200,676	77	Woods, Good, HSG D
8,275	83	Woods, Poor, HSG D
341,483	75	Weighted Average
341,483		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	150	0.1067	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
2.8	296	0.1216	1.74		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
17.8	446	Total			

Summary for Subcatchment SA-2:

Runoff = 17.39 cfs @ 12.37 hrs, Volume= 1.939 af, Depth> 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
2,883	70	Woods, Good, HSG C
259,270	77	Woods, Good, HSG D
28,142	83	Woods, Poor, HSG D
290,295	78	Weighted Average
290,295		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.1	150	0.0667	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
8.8	510	0.0373	0.97		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
26.9	660	Total			

Pre-Development

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Type III 24-hr 25-YR Rainfall=6.20"

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Summary for Subcatchment SA-3:

Runoff = 3.32 cfs @ 12.21 hrs, Volume= 0.291 af, Depth> 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
34,989	70	Woods, Good, HSG C
3,545	77	Woods, Poor, HSG C
7,882	77	Woods, Good, HSG D
3,967	83	Woods, Poor, HSG D
50,383	73	Weighted Average
50,383		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	150	0.1067	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"

Summary for Link AP-1:

Inflow Area = 7.839 ac, 0.00% Impervious, Inflow Depth > 3.21" for 25-YR event
 Inflow = 22.36 cfs @ 12.25 hrs, Volume= 2.096 af
 Primary = 22.36 cfs @ 12.25 hrs, Volume= 2.096 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link AP-2:

Inflow Area = 6.664 ac, 0.00% Impervious, Inflow Depth > 3.49" for 25-YR event
 Inflow = 17.39 cfs @ 12.37 hrs, Volume= 1.939 af
 Primary = 17.39 cfs @ 12.37 hrs, Volume= 1.939 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link AP-3:

Inflow Area = 1.157 ac, 0.00% Impervious, Inflow Depth > 3.02" for 25-YR event
 Inflow = 3.32 cfs @ 12.21 hrs, Volume= 0.291 af
 Primary = 3.32 cfs @ 12.21 hrs, Volume= 0.291 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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Type III 24-hr 2-YR Rainfall=3.30"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-1: Runoff Area=341,483 sf 0.00% Impervious Runoff Depth>1.06"
Flow Length=446' Tc=17.8 min CN=75 Runoff=7.20 cfs 0.691 af

Subcatchment SA-2: Runoff Area=290,295 sf 0.00% Impervious Runoff Depth>1.23"
Flow Length=660' Tc=26.9 min CN=78 Runoff=6.10 cfs 0.683 af

Subcatchment SA-3: Runoff Area=50,383 sf 0.00% Impervious Runoff Depth>0.95"
Flow Length=150' Slope=0.1067 '/' Tc=15.0 min CN=73 Runoff=1.00 cfs 0.092 af

Link AP-1: Inflow=7.20 cfs 0.691 af
Primary=7.20 cfs 0.691 af

Link AP-2: Inflow=6.10 cfs 0.683 af
Primary=6.10 cfs 0.683 af

Link AP-3: Inflow=1.00 cfs 0.092 af
Primary=1.00 cfs 0.092 af

Total Runoff Area = 15.660 ac Runoff Volume = 1.466 af Average Runoff Depth = 1.12"
100.00% Pervious = 15.660 ac 0.00% Impervious = 0.000 ac

Pre-Development

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Type III 24-hr 10-YR Rainfall=4.90"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-1: Runoff Area=341,483 sf 0.00% Impervious Runoff Depth>2.19"
Flow Length=446' Tc=17.8 min CN=75 Runoff=15.25 cfs 1.429 af

Subcatchment SA-2: Runoff Area=290,295 sf 0.00% Impervious Runoff Depth>2.43"
Flow Length=660' Tc=26.9 min CN=78 Runoff=12.15 cfs 1.349 af

Subcatchment SA-3: Runoff Area=50,383 sf 0.00% Impervious Runoff Depth>2.03"
Flow Length=150' Slope=0.1067 '/' Tc=15.0 min CN=73 Runoff=2.23 cfs 0.196 af

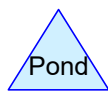
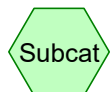
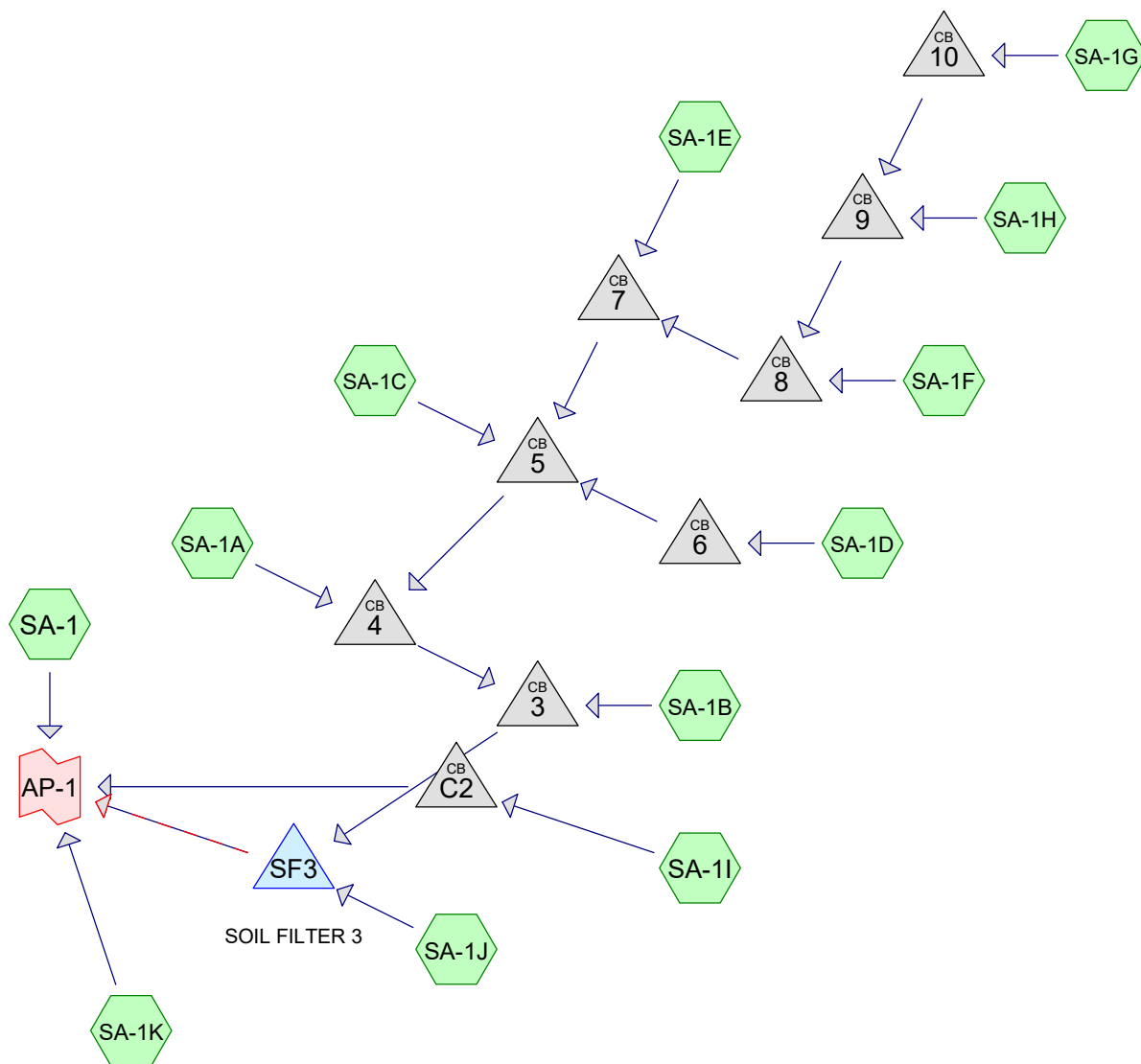
Link AP-1: Inflow=15.25 cfs 1.429 af
Primary=15.25 cfs 1.429 af

Link AP-2: Inflow=12.15 cfs 1.349 af
Primary=12.15 cfs 1.349 af

Link AP-3: Inflow=2.23 cfs 0.196 af
Primary=2.23 cfs 0.196 af

Total Runoff Area = 15.660 ac Runoff Volume = 2.973 af Average Runoff Depth = 2.28"
100.00% Pervious = 15.660 ac 0.00% Impervious = 0.000 ac

Appendix C
Post Development Calculations



Routing Diagram for Post-Development-AP-1
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Post-Development-AP-1

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Type III 24-hr 25-YR Rainfall=6.20"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-1: Runoff Area=268,518 sf 4.27% Impervious Runoff Depth>3.31"
 Flow Length=446' Tc=17.8 min CN=76 Runoff=18.09 cfs 1.698 af

Subcatchment SA-1A: Runoff Area=816 sf 100.00% Impervious Runoff Depth>5.51"
 Flow Length=98' Slope=0.0393 '/' Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af

Subcatchment SA-1B: Runoff Area=1,149 sf 100.00% Impervious Runoff Depth>5.51"
 Flow Length=104' Slope=0.0365 '/' Tc=6.0 min CN=98 Runoff=0.16 cfs 0.012 af

Subcatchment SA-1C: Runoff Area=3,309 sf 100.00% Impervious Runoff Depth>5.51"
 Flow Length=228' Tc=6.0 min CN=98 Runoff=0.45 cfs 0.035 af

Subcatchment SA-1D: Runoff Area=4,592 sf 100.00% Impervious Runoff Depth>5.51"
 Flow Length=248' Tc=6.0 min CN=98 Runoff=0.63 cfs 0.048 af

Subcatchment SA-1E: Runoff Area=1,630 sf 88.83% Impervious Runoff Depth>5.27"
 Flow Length=100' Slope=0.0130 '/' Tc=6.0 min CN=95 Runoff=0.22 cfs 0.016 af

Subcatchment SA-1F: Runoff Area=2,978 sf 91.91% Impervious Runoff Depth>5.36"
 Flow Length=90' Slope=0.0122 '/' Tc=6.0 min CN=96 Runoff=0.40 cfs 0.031 af

Subcatchment SA-1G: Runoff Area=2,298 sf 100.00% Impervious Runoff Depth>5.51"
 Flow Length=160' Tc=6.0 min CN=98 Runoff=0.31 cfs 0.024 af

Subcatchment SA-1H: Runoff Area=2,916 sf 100.00% Impervious Runoff Depth>5.51"
 Flow Length=150' Slope=0.0371 '/' Tc=6.0 min CN=98 Runoff=0.40 cfs 0.031 af

Subcatchment SA-1I: Runoff Area=39,119 sf 25.56% Impervious Runoff Depth>4.02"
 Flow Length=307' Tc=13.3 min CN=83 Runoff=3.49 cfs 0.301 af

Subcatchment SA-1J: Runoff Area=15,900 sf 0.00% Impervious Runoff Depth>3.21"
 Flow Length=223' Tc=12.0 min CN=75 Runoff=1.21 cfs 0.098 af

Subcatchment SA-1K: Runoff Area=3,460 sf 0.00% Impervious Runoff Depth>2.93"
 Tc=6.0 min CN=72 Runoff=0.29 cfs 0.019 af

Pond 3: Peak Elev=105.10' Inflow=2.67 cfs 0.206 af
 15.0" Round Culvert n=0.013 L=19.0' S=0.0053 '/' Outflow=2.67 cfs 0.206 af

Pond 4: Peak Elev=105.18' Inflow=2.52 cfs 0.194 af
 15.0" Round Culvert n=0.013 L=23.0' S=0.0052 '/' Outflow=2.52 cfs 0.194 af

Pond 5: Peak Elev=106.38' Inflow=2.41 cfs 0.185 af
 15.0" Round Culvert n=0.013 L=54.0' S=0.0256 '/' Outflow=2.41 cfs 0.185 af

Pond 6: Peak Elev=106.32' Inflow=0.63 cfs 0.048 af
 15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.63 cfs 0.048 af

Post-Development-AP-1

Type III 24-hr 25-YR Rainfall=6.20"

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Pond 7: Peak Elev=110.86' Inflow=1.33 cfs 0.102 af
15.0" Round Culvert n=0.013 L=228.0' S=0.0202 '/' Outflow=1.33 cfs 0.102 af

Pond 8: Peak Elev=111.20' Inflow=1.11 cfs 0.085 af
15.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=1.11 cfs 0.085 af

Pond 9: Peak Elev=111.49' Inflow=0.71 cfs 0.055 af
15.0" Round Culvert n=0.013 L=25.0' S=0.0136 '/' Outflow=0.71 cfs 0.055 af

Pond 10: Peak Elev=111.70' Inflow=0.31 cfs 0.024 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.31 cfs 0.024 af

Pond C2: Peak Elev=107.64' Inflow=3.49 cfs 0.301 af
18.0" Round Culvert n=0.013 L=71.0' S=0.1007 '/' Outflow=3.49 cfs 0.301 af

Pond SF3: SOIL FILTER 3 Peak Elev=105.40' Storage=7,095 cf Inflow=3.66 cfs 0.304 af
Primary=0.75 cfs 0.220 af Secondary=0.00 cfs 0.000 af Outflow=0.75 cfs 0.220 af

Link AP-1: Inflow=22.08 cfs 2.238 af
Primary=22.08 cfs 2.238 af

Total Runoff Area = 7.959 ac Runoff Volume = 2.321 af Average Runoff Depth = 3.50"
88.25% Pervious = 7.023 ac 11.75% Impervious = 0.935 ac

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Type III 24-hr 25-YR Rainfall=6.20"

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Summary for Subcatchment SA-1:

Runoff = 18.09 cfs @ 12.25 hrs, Volume= 1.698 af, Depth> 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
54,450	70	Woods, Good, HSG C
195,029	77	Woods, Good, HSG D
7,365	74	>75% Grass cover, Good, HSG C
197	80	>75% Grass cover, Good, HSG D
* 10,000	98	Assumed Future Duplexes
* 1,477	98	Paved parking, HSG C PR Barra Road
268,518	76	Weighted Average
257,041		95.73% Pervious Area
11,477		4.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	150	0.1067	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
2.8	296	0.1216	1.74		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
17.8	446	Total			

Summary for Subcatchment SA-1A:

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
816	98	Paved parking, HSG A
816		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	98	0.0393	1.82		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.9	98	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-1B:

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 0.012 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

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Type III 24-hr 25-YR Rainfall=6.20"

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Area (sf)	CN	Description
1,149	98	Paved parking, HSG A
1,149		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	104	0.0365	1.79		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.0	104	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-1C:

Runoff = 0.45 cfs @ 12.09 hrs, Volume= 0.035 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
3,309	98	Paved parking, HSG A
3,309		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	150	0.0180	1.45		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.3	78	0.0365	3.88		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.0	228	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-1D:

Runoff = 0.63 cfs @ 12.09 hrs, Volume= 0.048 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
4,592	98	Paved parking, HSG A
4,592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	150	0.0153	1.36		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.4	98	0.0347	3.78		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.2	248	Total, Increased to minimum Tc = 6.0 min			

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Type III 24-hr 25-YR Rainfall=6.20"

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Summary for Subcatchment SA-1E:

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.016 af, Depth> 5.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
1,448	98	Paved parking, HSG A
182	74	>75% Grass cover, Good, HSG C
1,630	95	Weighted Average
182		11.17% Pervious Area
1,448		88.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0130	1.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.4	100	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-1F:

Runoff = 0.40 cfs @ 12.09 hrs, Volume= 0.031 af, Depth> 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
2,737	98	Paved parking, HSG A
241	74	>75% Grass cover, Good, HSG C
2,978	96	Weighted Average
241		8.09% Pervious Area
2,737		91.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	90	0.0122	1.12		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.3	90	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-1G:

Runoff = 0.31 cfs @ 12.09 hrs, Volume= 0.024 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

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Type III 24-hr 25-YR Rainfall=6.20"

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Area (sf)	CN	Description
2,298	98	Paved parking, HSG A
2,298		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	150	0.0338	1.87		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.0	10	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.3	160	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-1H:

Runoff = 0.40 cfs @ 12.09 hrs, Volume= 0.031 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
2,916	98	Paved parking, HSG A
2,916		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	150	0.0371	1.94		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.3	150	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-1I:

Runoff = 3.49 cfs @ 12.18 hrs, Volume= 0.301 af, Depth> 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
6,738	77	Woods, Poor, HSG C
2,944	77	Woods, Good, HSG D
9,623	83	Woods, Poor, HSG D
7,804	74	>75% Grass cover, Good, HSG C
2,010	80	>75% Grass cover, Good, HSG D
* 10,000	98	Assumed Duplexes
39,119	83	Weighted Average
29,119		74.44% Pervious Area
10,000		25.56% Impervious Area

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Type III 24-hr 25-YR Rainfall=6.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	150	0.1533	0.19		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.2	45	0.0444	3.16		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	112	0.0357	23.00	199.30	Parabolic Channel, W=6.50' D=2.00' Area=8.7 sf Perim=7.9' n= 0.013
13.3	307	Total			

Summary for Subcatchment SA-1J:

Runoff = 1.21 cfs @ 12.17 hrs, Volume= 0.098 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
998	70	Woods, Good, HSG C
8,127	77	Woods, Poor, HSG C
21	77	Woods, Good, HSG D
6,754	74	>75% Grass cover, Good, HSG C
15,900	75	Weighted Average
15,900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	150	0.1933	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.2	73	0.1986	6.68		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
12.0	223	Total			

Summary for Subcatchment SA-1K:

Runoff = 0.29 cfs @ 12.09 hrs, Volume= 0.019 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
1,632	74	>75% Grass cover, Good, HSG C
1,828	70	Woods, Good, HSG C
3,460	72	Weighted Average
3,460		100.00% Pervious Area

Post-Development-AP-1

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Type III 24-hr 25-YR Rainfall=6.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Assumed Min.

Summary for Pond 3:

Inflow Area = 0.452 ac, 97.85% Impervious, Inflow Depth > 5.47" for 25-YR event
 Inflow = 2.67 cfs @ 12.09 hrs, Volume= 0.206 af
 Outflow = 2.67 cfs @ 12.09 hrs, Volume= 0.206 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.67 cfs @ 12.09 hrs, Volume= 0.206 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 105.10' @ 12.09 hrs

Flood Elev= 106.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	104.10'	15.0" Round Culvert L= 19.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 104.10' / 104.00' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.60 cfs @ 12.09 hrs HW=105.09' (Free Discharge)↑**1=Culvert** (Barrel Controls 2.60 cfs @ 3.44 fps)**Summary for Pond 4:**

Inflow Area = 0.426 ac, 97.72% Impervious, Inflow Depth > 5.46" for 25-YR event
 Inflow = 2.52 cfs @ 12.09 hrs, Volume= 0.194 af
 Outflow = 2.52 cfs @ 12.09 hrs, Volume= 0.194 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.52 cfs @ 12.09 hrs, Volume= 0.194 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 105.18' @ 12.09 hrs

Flood Elev= 107.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	104.22'	15.0" Round Culvert L= 23.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 104.22' / 104.10' S= 0.0052 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.45 cfs @ 12.09 hrs HW=105.17' (Free Discharge)↑**1=Culvert** (Barrel Controls 2.45 cfs @ 3.40 fps)**Summary for Pond 5:**

Inflow Area = 0.407 ac, 97.61% Impervious, Inflow Depth > 5.46" for 25-YR event
 Inflow = 2.41 cfs @ 12.09 hrs, Volume= 0.185 af
 Outflow = 2.41 cfs @ 12.09 hrs, Volume= 0.185 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.41 cfs @ 12.09 hrs, Volume= 0.185 af

Post-Development-AP-1

Type III 24-hr 25-YR Rainfall=6.20"

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Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 106.38' @ 12.09 hrs

Flood Elev= 109.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	105.60'	15.0" Round Culvert L= 54.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.60' / 104.22' S= 0.0256 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.34 cfs @ 12.09 hrs HW=106.36' (Free Discharge)↑**1=Culvert** (Inlet Controls 2.34 cfs @ 2.98 fps)**Summary for Pond 6:**

Inflow Area = 0.105 ac, 100.00% Impervious, Inflow Depth > 5.51" for 25-YR event
Inflow = 0.63 cfs @ 12.09 hrs, Volume= 0.048 af
Outflow = 0.63 cfs @ 12.09 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.09 hrs, Volume= 0.048 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 106.32' @ 12.09 hrs

Flood Elev= 109.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	105.93'	15.0" Round Culvert L= 23.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.93' / 105.70' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.61 cfs @ 12.09 hrs HW=106.32' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.61 cfs @ 2.80 fps)**Summary for Pond 7:**

Inflow Area = 0.225 ac, 95.69% Impervious, Inflow Depth > 5.42" for 25-YR event
Inflow = 1.33 cfs @ 12.09 hrs, Volume= 0.102 af
Outflow = 1.33 cfs @ 12.09 hrs, Volume= 0.102 af, Atten= 0%, Lag= 0.0 min
Primary = 1.33 cfs @ 12.09 hrs, Volume= 0.102 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 110.86' @ 12.09 hrs

Flood Elev= 115.14'

Device	Routing	Invert	Outlet Devices
#1	Primary	110.31'	15.0" Round Culvert L= 228.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 110.31' / 105.70' S= 0.0202 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Post-Development-AP-1

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Type III 24-hr 25-YR Rainfall=6.20"

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Primary OutFlow Max=1.29 cfs @ 12.09 hrs HW=110.86' (Free Discharge)↑**1=Culvert** (Inlet Controls 1.29 cfs @ 2.51 fps)**Summary for Pond 8:**

Inflow Area = 0.188 ac, 97.06% Impervious, Inflow Depth > 5.45" for 25-YR event
 Inflow = 1.11 cfs @ 12.09 hrs, Volume= 0.085 af
 Outflow = 1.11 cfs @ 12.09 hrs, Volume= 0.085 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.11 cfs @ 12.09 hrs, Volume= 0.085 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 111.20' @ 12.09 hrs

Flood Elev= 115.28'

Device	Routing	Invert	Outlet Devices
#1	Primary	110.66'	15.0" Round Culvert L= 25.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 110.66' / 110.41' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=1.08 cfs @ 12.09 hrs HW=111.19' (Free Discharge)↑**1=Culvert** (Barrel Controls 1.08 cfs @ 3.20 fps)**Summary for Pond 9:**

Inflow Area = 0.120 ac, 100.00% Impervious, Inflow Depth > 5.51" for 25-YR event
 Inflow = 0.71 cfs @ 12.09 hrs, Volume= 0.055 af
 Outflow = 0.71 cfs @ 12.09 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.71 cfs @ 12.09 hrs, Volume= 0.055 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 111.49' @ 12.09 hrs

Flood Elev= 115.87'

Device	Routing	Invert	Outlet Devices
#1	Primary	111.10'	15.0" Round Culvert L= 25.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 111.10' / 110.76' S= 0.0136 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.69 cfs @ 12.09 hrs HW=111.49' (Free Discharge)↑**1=Culvert** (Inlet Controls 0.69 cfs @ 2.12 fps)**Summary for Pond 10:**

Inflow Area = 0.053 ac, 100.00% Impervious, Inflow Depth > 5.51" for 25-YR event
 Inflow = 0.31 cfs @ 12.09 hrs, Volume= 0.024 af
 Outflow = 0.31 cfs @ 12.09 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.31 cfs @ 12.09 hrs, Volume= 0.024 af

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Type III 24-hr 25-YR Rainfall=6.20"

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Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 111.70' @ 12.09 hrs

Flood Elev= 115.67'

Device	Routing	Invert	Outlet Devices
#1	Primary	111.43'	15.0" Round Culvert L= 23.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 111.43' / 111.20' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.30 cfs @ 12.09 hrs HW=111.70' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.30 cfs @ 2.39 fps)**Summary for Pond C2:**

Inflow Area = 0.898 ac, 25.56% Impervious, Inflow Depth > 4.02" for 25-YR event
Inflow = 3.49 cfs @ 12.18 hrs, Volume= 0.301 af
Outflow = 3.49 cfs @ 12.18 hrs, Volume= 0.301 af, Atten= 0%, Lag= 0.0 min
Primary = 3.49 cfs @ 12.18 hrs, Volume= 0.301 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 107.64' @ 12.18 hrs

Flood Elev= 109.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	106.75'	18.0" Round Culvert L= 71.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 106.75' / 99.60' S= 0.1007 ' S= 0.1007 ' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=3.45 cfs @ 12.18 hrs HW=107.63' (Free Discharge)↑**1=Culvert** (Inlet Controls 3.45 cfs @ 3.20 fps)**Summary for Pond SF3: SOIL FILTER 3**

Inflow Area = 0.817 ac, 54.13% Impervious, Inflow Depth > 4.46" for 25-YR event
Inflow = 3.66 cfs @ 12.10 hrs, Volume= 0.304 af
Outflow = 0.75 cfs @ 12.59 hrs, Volume= 0.220 af, Atten= 80%, Lag= 29.5 min
Primary = 0.75 cfs @ 12.59 hrs, Volume= 0.220 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 105.40' @ 12.59 hrs Surf.Area= 4,476 sf Storage= 7,095 cf

Plug-Flow detention time= 161.9 min calculated for 0.219 af (72% of inflow)

Center-of-Mass det. time= 96.8 min (851.2 - 754.4)

Post-Development-AP-1

Type III 24-hr 25-YR Rainfall=6.20"

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Volume	Invert	Avail.Storage	Storage Description
#1	102.50'	8,466 cf	Custom Stage Data (Irregular) Listed below (Recalc)
#2	100.17'	628 cf	Custom Stage Data (Irregular) Listed below (Recalc)
			3,139 cf Overall x 20.0% Voids
			9,094 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.50	1,347	162.8	0	0	1,347
103.00	1,685	178.1	756	756	1,771
104.00	2,248	196.9	1,960	2,716	2,362
105.00	2,867	215.8	2,551	5,267	3,016
106.00	3,542	234.6	3,199	8,466	3,727

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
100.17	1,347	162.8	0	0	1,347
102.50	1,347	162.8	3,139	3,139	1,726

Device	Routing	Invert	Outlet Devices
#1	Device 4	104.00'	5.0" Vert. Orifice/Grate C= 0.600
#2	Device 3	100.17'	2.410 in/hr Exfiltration over Surface area
#3	Device 4	100.17'	0.7" Vert. Orifice/Grate C= 0.600
#4	Primary	100.17'	15.0" Round Culvert L= 20.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.17' / 100.07' S= 0.0050 ' S Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#5	Secondary	105.50'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.75 cfs @ 12.59 hrs HW=105.40' (Free Discharge)

4=Culvert (Passes 0.75 cfs of 12.68 cfs potential flow)
 1=Orifice/Grate (Orifice Controls 0.72 cfs @ 5.26 fps)
 3=Orifice/Grate (Orifice Controls 0.03 cfs @ 10.98 fps)
 2=Exfiltration (Passes 0.03 cfs of 0.25 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=100.18' (Free Discharge)

5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link AP-1:

Inflow Area = 7.959 ac, 11.75% Impervious, Inflow Depth > 3.37" for 25-YR event
 Inflow = 22.08 cfs @ 12.24 hrs, Volume= 2.238 af
 Primary = 22.08 cfs @ 12.24 hrs, Volume= 2.238 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Post-Development-AP-1

Type III 24-hr 2-YR Rainfall=3.30"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-1: Runoff Area=268,518 sf 4.27% Impervious Runoff Depth>1.12"
 Flow Length=446' Tc=17.8 min CN=76 Runoff=6.01 cfs 0.573 af

Subcatchment SA-1A: Runoff Area=816 sf 100.00% Impervious Runoff Depth>2.87"
 Flow Length=98' Slope=0.0393 '/' Tc=6.0 min CN=98 Runoff=0.06 cfs 0.004 af

Subcatchment SA-1B: Runoff Area=1,149 sf 100.00% Impervious Runoff Depth>2.87"
 Flow Length=104' Slope=0.0365 '/' Tc=6.0 min CN=98 Runoff=0.08 cfs 0.006 af

Subcatchment SA-1C: Runoff Area=3,309 sf 100.00% Impervious Runoff Depth>2.87"
 Flow Length=228' Tc=6.0 min CN=98 Runoff=0.24 cfs 0.018 af

Subcatchment SA-1D: Runoff Area=4,592 sf 100.00% Impervious Runoff Depth>2.87"
 Flow Length=248' Tc=6.0 min CN=98 Runoff=0.33 cfs 0.025 af

Subcatchment SA-1E: Runoff Area=1,630 sf 88.83% Impervious Runoff Depth>2.59"
 Flow Length=100' Slope=0.0130 '/' Tc=6.0 min CN=95 Runoff=0.11 cfs 0.008 af

Subcatchment SA-1F: Runoff Area=2,978 sf 91.91% Impervious Runoff Depth>2.69"
 Flow Length=90' Slope=0.0122 '/' Tc=6.0 min CN=96 Runoff=0.21 cfs 0.015 af

Subcatchment SA-1G: Runoff Area=2,298 sf 100.00% Impervious Runoff Depth>2.87"
 Flow Length=160' Tc=6.0 min CN=98 Runoff=0.17 cfs 0.013 af

Subcatchment SA-1H: Runoff Area=2,916 sf 100.00% Impervious Runoff Depth>2.87"
 Flow Length=150' Slope=0.0371 '/' Tc=6.0 min CN=98 Runoff=0.21 cfs 0.016 af

Subcatchment SA-1I: Runoff Area=39,119 sf 25.56% Impervious Runoff Depth>1.57"
 Flow Length=307' Tc=13.3 min CN=83 Runoff=1.39 cfs 0.117 af

Subcatchment SA-1J: Runoff Area=15,900 sf 0.00% Impervious Runoff Depth>1.06"
 Flow Length=223' Tc=12.0 min CN=75 Runoff=0.39 cfs 0.032 af

Subcatchment SA-1K: Runoff Area=3,460 sf 0.00% Impervious Runoff Depth>0.90"
 Tc=6.0 min CN=72 Runoff=0.08 cfs 0.006 af

Pond 3: Peak Elev=104.79' Inflow=1.40 cfs 0.106 af
 15.0" Round Culvert n=0.013 L=19.0' S=0.0053 '/' Outflow=1.40 cfs 0.106 af

Pond 4: Peak Elev=104.88' Inflow=1.32 cfs 0.100 af
 15.0" Round Culvert n=0.013 L=23.0' S=0.0052 '/' Outflow=1.32 cfs 0.100 af

Pond 5: Peak Elev=106.14' Inflow=1.26 cfs 0.095 af
 15.0" Round Culvert n=0.013 L=54.0' S=0.0256 '/' Outflow=1.26 cfs 0.095 af

Pond 6: Peak Elev=106.21' Inflow=0.33 cfs 0.025 af
 15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.33 cfs 0.025 af

Post-Development-AP-1

Type III 24-hr 2-YR Rainfall=3.30"

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Pond 7:

Peak Elev=110.70' Inflow=0.69 cfs 0.052 af
15.0" Round Culvert n=0.013 L=228.0' S=0.0202 '/' Outflow=0.69 cfs 0.052 af

Pond 8:

Peak Elev=111.04' Inflow=0.58 cfs 0.044 af
15.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=0.58 cfs 0.044 af

Pond 9:

Peak Elev=111.38' Inflow=0.37 cfs 0.029 af
15.0" Round Culvert n=0.013 L=25.0' S=0.0136 '/' Outflow=0.37 cfs 0.029 af

Pond 10:

Peak Elev=111.62' Inflow=0.17 cfs 0.013 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.17 cfs 0.013 af

Pond C2:

Peak Elev=107.28' Inflow=1.39 cfs 0.117 af
18.0" Round Culvert n=0.013 L=71.0' S=0.1007 '/' Outflow=1.39 cfs 0.117 af

Pond SF3: SOIL FILTER 3

Peak Elev=104.21' Storage=3,838 cf Inflow=1.70 cfs 0.138 af
Primary=0.14 cfs 0.058 af Secondary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.058 af

Link AP-1:

Inflow=7.34 cfs 0.754 af
Primary=7.34 cfs 0.754 af

Total Runoff Area = 7.959 ac Runoff Volume = 0.835 af Average Runoff Depth = 1.26"
88.25% Pervious = 7.023 ac 11.75% Impervious = 0.935 ac

Post-Development-AP-1

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Type III 24-hr 10-YR Rainfall=4.90"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-1: Runoff Area=268,518 sf 4.27% Impervious Runoff Depth>2.27"
Flow Length=446' Tc=17.8 min CN=76 Runoff=12.45 cfs 1.165 af

Subcatchment SA-1A: Runoff Area=816 sf 100.00% Impervious Runoff Depth>4.33"
Flow Length=98' Slope=0.0393 '/' Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment SA-1B: Runoff Area=1,149 sf 100.00% Impervious Runoff Depth>4.33"
Flow Length=104' Slope=0.0365 '/' Tc=6.0 min CN=98 Runoff=0.12 cfs 0.010 af

Subcatchment SA-1C: Runoff Area=3,309 sf 100.00% Impervious Runoff Depth>4.33"
Flow Length=228' Tc=6.0 min CN=98 Runoff=0.36 cfs 0.027 af

Subcatchment SA-1D: Runoff Area=4,592 sf 100.00% Impervious Runoff Depth>4.33"
Flow Length=248' Tc=6.0 min CN=98 Runoff=0.49 cfs 0.038 af

Subcatchment SA-1E: Runoff Area=1,630 sf 88.83% Impervious Runoff Depth>4.07"
Flow Length=100' Slope=0.0130 '/' Tc=6.0 min CN=95 Runoff=0.17 cfs 0.013 af

Subcatchment SA-1F: Runoff Area=2,978 sf 91.91% Impervious Runoff Depth>4.16"
Flow Length=90' Slope=0.0122 '/' Tc=6.0 min CN=96 Runoff=0.31 cfs 0.024 af

Subcatchment SA-1G: Runoff Area=2,298 sf 100.00% Impervious Runoff Depth>4.33"
Flow Length=160' Tc=6.0 min CN=98 Runoff=0.25 cfs 0.019 af

Subcatchment SA-1H: Runoff Area=2,916 sf 100.00% Impervious Runoff Depth>4.33"
Flow Length=150' Slope=0.0371 '/' Tc=6.0 min CN=98 Runoff=0.31 cfs 0.024 af

Subcatchment SA-1I: Runoff Area=39,119 sf 25.56% Impervious Runoff Depth>2.88"
Flow Length=307' Tc=13.3 min CN=83 Runoff=2.54 cfs 0.216 af

Subcatchment SA-1J: Runoff Area=15,900 sf 0.00% Impervious Runoff Depth>2.19"
Flow Length=223' Tc=12.0 min CN=75 Runoff=0.82 cfs 0.067 af

Subcatchment SA-1K: Runoff Area=3,460 sf 0.00% Impervious Runoff Depth>1.96"
Tc=6.0 min CN=72 Runoff=0.19 cfs 0.013 af

Pond 3: Peak Elev=104.97' Inflow=2.10 cfs 0.161 af
15.0" Round Culvert n=0.013 L=19.0' S=0.0053 '/' Outflow=2.10 cfs 0.161 af

Pond 4: Peak Elev=105.05' Inflow=1.98 cfs 0.152 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0052 '/' Outflow=1.98 cfs 0.152 af

Pond 5: Peak Elev=106.28' Inflow=1.89 cfs 0.145 af
15.0" Round Culvert n=0.013 L=54.0' S=0.0256 '/' Outflow=1.89 cfs 0.145 af

Pond 6: Peak Elev=106.28' Inflow=0.49 cfs 0.038 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.49 cfs 0.038 af

Post-Development-AP-1

Type III 24-hr 10-YR Rainfall=4.90"

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Pond 7: Peak Elev=110.80' Inflow=1.05 cfs 0.080 af
15.0" Round Culvert n=0.013 L=228.0' S=0.0202 '/' Outflow=1.05 cfs 0.080 af

Pond 8: Peak Elev=111.13' Inflow=0.87 cfs 0.067 af
15.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=0.87 cfs 0.067 af

Pond 9: Peak Elev=111.45' Inflow=0.56 cfs 0.043 af
15.0" Round Culvert n=0.013 L=25.0' S=0.0136 '/' Outflow=0.56 cfs 0.043 af

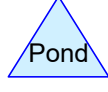
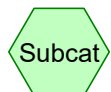
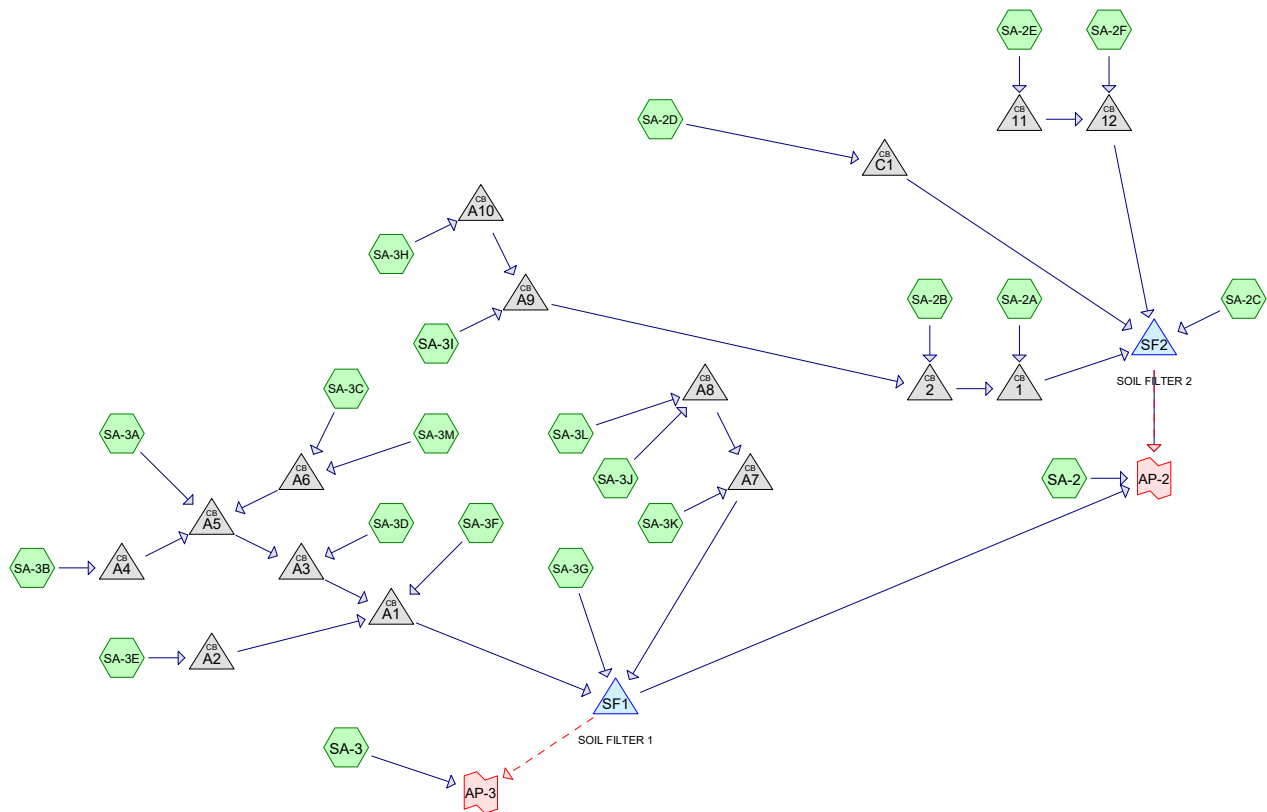
Pond 10: Peak Elev=111.67' Inflow=0.25 cfs 0.019 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.25 cfs 0.019 af

Pond C2: Peak Elev=107.49' Inflow=2.54 cfs 0.216 af
18.0" Round Culvert n=0.013 L=71.0' S=0.1007 '/' Outflow=2.54 cfs 0.216 af

Pond SF3: SOIL FILTER 3 Peak Elev=104.83' Storage=5,412 cf Inflow=2.77 cfs 0.228 af
Primary=0.54 cfs 0.146 af Secondary=0.00 cfs 0.000 af Outflow=0.54 cfs 0.146 af

Link AP-1: Inflow=15.28 cfs 1.540 af
Primary=15.28 cfs 1.540 af

Total Runoff Area = 7.959 ac Runoff Volume = 1.622 af Average Runoff Depth = 2.45"
88.25% Pervious = 7.023 ac 11.75% Impervious = 0.935 ac



Routing Diagram for Post-Development-AP-2 & 3
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Post-Development-AP-2 & 3

Type III 24-hr 25-YR Rainfall=6.20"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-2:	Runoff Area=209,759 sf 4.77% Impervious Runoff Depth>3.49" Flow Length=660' Tc=26.9 min CN=78 Runoff=12.57 cfs 1.401 af
Subcatchment SA-2A:	Runoff Area=2,804 sf 100.00% Impervious Runoff Depth>5.51" Flow Length=190' Tc=6.0 min CN=98 Runoff=0.38 cfs 0.030 af
Subcatchment SA-2B:	Runoff Area=3,586 sf 100.00% Impervious Runoff Depth>5.51" Flow Length=190' Tc=6.0 min CN=98 Runoff=0.49 cfs 0.038 af
Subcatchment SA-2C:	Runoff Area=3,954 sf 0.00% Impervious Runoff Depth>3.72" Flow Length=40' Slope=0.1750 '/' Tc=6.0 min CN=80 Runoff=0.41 cfs 0.028 af
Subcatchment SA-2D:	Runoff Area=23,916 sf 20.91% Impervious Runoff Depth>4.12" Flow Length=223' Tc=13.7 min CN=84 Runoff=2.16 cfs 0.188 af
Subcatchment SA-2E:	Runoff Area=888 sf 100.00% Impervious Runoff Depth>5.51" Tc=6.0 min CN=98 Runoff=0.12 cfs 0.009 af
Subcatchment SA-2F:	Runoff Area=782 sf 100.00% Impervious Runoff Depth>5.51" Tc=6.0 min CN=98 Runoff=0.11 cfs 0.008 af
Subcatchment SA-3:	Runoff Area=32,582 sf 0.00% Impervious Runoff Depth>3.02" Flow Length=108' Slope=0.0370 '/' Tc=17.6 min CN=73 Runoff=2.02 cfs 0.188 af
Subcatchment SA-3A:	Runoff Area=7,214 sf 90.84% Impervious Runoff Depth>5.36" Flow Length=102' Slope=0.0069 '/' Tc=6.0 min CN=96 Runoff=0.97 cfs 0.074 af
Subcatchment SA-3B:	Runoff Area=2,033 sf 100.00% Impervious Runoff Depth>5.51" Flow Length=82' Slope=0.0201 '/' Tc=6.0 min CN=98 Runoff=0.28 cfs 0.021 af
Subcatchment SA-3C:	Runoff Area=1,985 sf 4.33% Impervious Runoff Depth>3.82" Flow Length=40' Slope=0.0150 '/' Tc=6.0 min CN=81 Runoff=0.21 cfs 0.014 af
Subcatchment SA-3D:	Runoff Area=5,267 sf 100.00% Impervious Runoff Depth>5.51" Flow Length=81' Slope=0.0172 '/' Tc=6.0 min CN=98 Runoff=0.72 cfs 0.056 af
Subcatchment SA-3E:	Runoff Area=2,898 sf 100.00% Impervious Runoff Depth>5.51" Flow Length=80' Slope=0.0225 '/' Tc=6.0 min CN=98 Runoff=0.39 cfs 0.031 af
Subcatchment SA-3F:	Runoff Area=2,559 sf 93.86% Impervious Runoff Depth>5.44" Flow Length=60' Slope=0.0200 '/' Tc=6.0 min CN=97 Runoff=0.35 cfs 0.027 af
Subcatchment SA-3G:	Runoff Area=9,411 sf 0.00% Impervious Runoff Depth>3.42" Flow Length=60' Slope=0.0875 '/' Tc=6.0 min CN=77 Runoff=0.91 cfs 0.062 af
Subcatchment SA-3H:	Runoff Area=2,721 sf 100.00% Impervious Runoff Depth>5.51" Flow Length=211' Tc=6.0 min CN=98 Runoff=0.37 cfs 0.029 af

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Type III 24-hr 25-YR Rainfall=6.20"

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Subcatchment SA-3I: Runoff Area=8,561 sf 30.28% Impervious Runoff Depth>4.55"
Flow Length=150' Slope=0.0140 '/' Tc=6.0 min CN=88 Runoff=1.05 cfs 0.075 af

Subcatchment SA-3J: Runoff Area=2,569 sf 0.00% Impervious Runoff Depth>3.82"
Flow Length=48' Slope=0.0625 '/' Tc=6.0 min CN=81 Runoff=0.27 cfs 0.019 af

Subcatchment SA-3K: Runoff Area=1,602 sf 0.00% Impervious Runoff Depth>3.72"
Flow Length=33' Slope=0.0758 '/' Tc=6.0 min CN=80 Runoff=0.17 cfs 0.011 af

Subcatchment SA-3L: Runoff Area=4,848 sf 100.00% Impervious Runoff Depth>5.51"
Tc=6.0 min CN=98 Runoff=0.66 cfs 0.051 af

Subcatchment SA-3M: Runoff Area=5,537 sf 100.00% Impervious Runoff Depth>5.51"
Tc=6.0 min CN=98 Runoff=0.75 cfs 0.058 af

Pond 1: Peak Elev=113.01' Inflow=2.29 cfs 0.171 af
15.0" Round Culvert n=0.013 L=19.0' S=0.0053 '/' Outflow=2.29 cfs 0.171 af

Pond 2: Peak Elev=113.04' Inflow=1.91 cfs 0.141 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0052 '/' Outflow=1.91 cfs 0.141 af

Pond 11: Peak Elev=112.66' Inflow=0.12 cfs 0.009 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.12 cfs 0.009 af

Pond 12: Peak Elev=112.39' Inflow=0.23 cfs 0.018 af
15.0" Round Culvert n=0.013 L=16.0' S=0.0100 '/' Outflow=0.23 cfs 0.018 af

Pond A1: Peak Elev=115.36' Inflow=3.67 cfs 0.281 af
15.0" Round Culvert n=0.013 L=26.0' S=0.0050 '/' Outflow=3.67 cfs 0.281 af

Pond A10: Peak Elev=113.19' Inflow=0.37 cfs 0.029 af
15.0" Round Culvert n=0.013 L=16.0' S=0.0100 '/' Outflow=0.37 cfs 0.029 af

Pond A2: Peak Elev=114.78' Inflow=0.39 cfs 0.031 af
15.0" Round Culvert n=0.013 L=62.0' S=0.0050 '/' Outflow=0.39 cfs 0.031 af

Pond A3: Peak Elev=116.09' Inflow=2.93 cfs 0.224 af
15.0" Round Culvert n=0.013 L=41.0' S=0.0100 '/' Outflow=2.93 cfs 0.224 af

Pond A4: Peak Elev=116.56' Inflow=0.28 cfs 0.021 af
15.0" Round Culvert n=0.013 L=49.0' S=0.0051 '/' Outflow=0.28 cfs 0.021 af

Pond A5: Peak Elev=116.77' Inflow=2.21 cfs 0.168 af
15.0" Round Culvert n=0.013 L=77.0' S=0.0100 '/' Outflow=2.21 cfs 0.168 af

Pond A6: Peak Elev=116.94' Inflow=0.97 cfs 0.073 af
15.0" Round Culvert n=0.013 L=52.0' S=0.0050 '/' Outflow=0.97 cfs 0.073 af

Pond A7: Peak Elev=115.60' Inflow=1.10 cfs 0.081 af
15.0" Round Culvert n=0.013 L=52.0' S=0.0050 '/' Outflow=1.10 cfs 0.081 af

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Type III 24-hr 25-YR Rainfall=6.20"

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Pond A8: Peak Elev=115.84' Inflow=0.93 cfs 0.070 af
15.0" Round Culvert n=0.013 L=59.0' S=0.0051 '/' Outflow=0.93 cfs 0.070 af

Pond A9: Peak Elev=113.23' Inflow=1.42 cfs 0.103 af
15.0" Round Culvert n=0.013 L=41.0' S=0.0100 '/' Outflow=1.42 cfs 0.103 af

Pond C1: Peak Elev=116.59' Inflow=2.16 cfs 0.188 af
15.0" Round Culvert n=0.013 L=81.0' S=0.0463 '/' Outflow=2.16 cfs 0.188 af

Pond SF1: SOIL FILTER 1 Peak Elev=114.78' Storage=9,845 cf Inflow=5.68 cfs 0.424 af
Primary=1.31 cfs 0.269 af Secondary=0.15 cfs 0.002 af Outflow=1.45 cfs 0.271 af

Pond SF2: SOIL FILTER 2 Peak Elev=111.81' Storage=3,563 cf Inflow=4.66 cfs 0.405 af
Primary=4.50 cfs 0.337 af Secondary=0.00 cfs 0.000 af Outflow=4.50 cfs 0.337 af

Link AP-2: Inflow=16.57 cfs 2.008 af
Primary=16.57 cfs 2.008 af

Link AP-3: Inflow=2.02 cfs 0.190 af
Primary=2.02 cfs 0.190 af

Total Runoff Area = 7.701 ac Runoff Volume = 2.418 af Average Runoff Depth = 3.77"
82.71% Pervious = 6.370 ac 17.29% Impervious = 1.331 ac

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Type III 24-hr 25-YR Rainfall=6.20"

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Summary for Subcatchment SA-2:

Runoff = 12.57 cfs @ 12.37 hrs, Volume= 1.401 af, Depth> 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
183,385	77	Woods, Good, HSG D
16,374	80	>75% Grass cover, Good, HSG D
* 10,000	98	Assumed Duplexes
209,759	78	Weighted Average
199,759		95.23% Pervious Area
10,000		4.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.1	150	0.0667	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
8.8	510	0.0373	0.97		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
26.9	660	Total			

Summary for Subcatchment SA-2A:

Runoff = 0.38 cfs @ 12.09 hrs, Volume= 0.030 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
2,804	98	Paved parking, HSG A
2,804		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	150	0.0338	1.87		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.2	40	0.0375	3.93		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.5	190	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-2B:

Runoff = 0.49 cfs @ 12.09 hrs, Volume= 0.038 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

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Type III 24-hr 25-YR Rainfall=6.20"

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Area (sf)	CN	Description
3,586	98	Paved parking, HSG A
3,586		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	150	0.0338	1.87		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.2	40	0.0375	3.93		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.5	190	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-2C:

Runoff = 0.41 cfs @ 12.09 hrs, Volume= 0.028 af, Depth> 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
3,954	80	>75% Grass cover, Good, HSG D
3,954		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	40	0.1750	0.34		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
1.9	40	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-2D:

Runoff = 2.16 cfs @ 12.19 hrs, Volume= 0.188 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
* 4,951	83	Woods, Poor, HSG D (Subdivision)
* 1,919	80	>75% Grass cover, Good, HSG D (Subdivision)
* 5,000	98	Assumed Duplex (Subdivision)
* 5,099	77	Woods, Good, HSG D (Avesta)
* 6,947	80	>75% Grass cover, Good, HSG D (Avesta)
23,916	84	Weighted Average
18,916		79.09% Pervious Area
5,000		20.91% Impervious Area

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Type III 24-hr 25-YR Rainfall=6.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	150	0.1433	0.19		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.1	12	0.1433	1.89		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	61	0.0300	3.68	5.52	Trap/Vee/Rect Channel Flow, Bot.W=2.00' D=0.50' Z= 2.0 '/' Top.W=4.00' n= 0.035
13.7	223	Total			

Summary for Subcatchment SA-2E:

Runoff = 0.12 cfs @ 12.09 hrs, Volume= 0.009 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
888	98	Paved roads w/curbs & sewers, HSG D
888		100.00% Impervious Area

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

Summary for Subcatchment SA-2F:

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.008 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
782	98	Paved parking, HSG D
782		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Assumed Min.

Summary for Subcatchment SA-3:

Runoff = 2.02 cfs @ 12.25 hrs, Volume= 0.188 af, Depth> 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

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Type III 24-hr 25-YR Rainfall=6.20"

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Area (sf)	CN	Description
15,066	70	Woods, Good, HSG C
2,921	77	Woods, Poor, HSG C
6,644	77	Woods, Good, HSG D
530	83	Woods, Poor, HSG D
5,718	74	>75% Grass cover, Good, HSG C
1,703	80	>75% Grass cover, Good, HSG D
32,582	73	Weighted Average
32,582		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.6	108	0.0370	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"

Summary for Subcatchment SA-3A:

Runoff = 0.97 cfs @ 12.09 hrs, Volume= 0.074 af, Depth> 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description			
661	80	>75% Grass cover, Good, HSG D			
6,553	98	Paved parking, HSG A			
7,214	96	Weighted Average			
661		9.16% Pervious Area			
6,553		90.84% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	102	0.0069	0.92		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.9	102	Total. Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3B:

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.021 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
2,033	98	Paved parking, HSG A
2,033		100.00% Impervious Area

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Type III 24-hr 25-YR Rainfall=6.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	82	0.0201	1.35		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.0	82	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3C:

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.014 af, Depth> 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
1,899	80	>75% Grass cover, Good, HSG D
86	98	Paved parking, HSG A
1,985	81	Weighted Average
1,899		95.67% Pervious Area
86		4.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	40	0.0150	1.04		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.6	40	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3D:

Runoff = 0.72 cfs @ 12.09 hrs, Volume= 0.056 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
5,267	98	Paved parking, HSG A
5,267		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	81	0.0172	1.26		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.1	81	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3E:

Runoff = 0.39 cfs @ 12.09 hrs, Volume= 0.031 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

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Type III 24-hr 25-YR Rainfall=6.20"

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Area (sf)	CN	Description
2,898	98	Paved parking, HSG A
2,898		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	80	0.0225	1.40		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.0	80	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3F:

Runoff = 0.35 cfs @ 12.09 hrs, Volume= 0.027 af, Depth> 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
157	74	>75% Grass cover, Good, HSG C
2,402	98	Paved parking, HSG A
2,559	97	Weighted Average
157		6.14% Pervious Area
2,402		93.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	60	0.0200	1.26		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.8	60	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3G:

Runoff = 0.91 cfs @ 12.09 hrs, Volume= 0.062 af, Depth> 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
4,181	74	>75% Grass cover, Good, HSG C
5,230	80	>75% Grass cover, Good, HSG D
9,411	77	Weighted Average
9,411		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	60	0.0875	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
3.6	60	Total, Increased to minimum Tc = 6.0 min			

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Summary for Subcatchment SA-3H:

Runoff = 0.37 cfs @ 12.09 hrs, Volume= 0.029 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
2,721	98	Paved parking, HSG A
2,721		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	150	0.0128	1.27		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.4	61	0.0156	2.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.4	211	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3I:

Runoff = 1.05 cfs @ 12.09 hrs, Volume= 0.075 af, Depth> 4.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
3,949	80	>75% Grass cover, Good, HSG D
2,020	91	Gravel roads, HSG D
2,592	98	Paved parking, HSG A
8,561	88	Weighted Average
5,969		69.72% Pervious Area
2,592		30.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0140	1.31		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.9	150	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3J:

Runoff = 0.27 cfs @ 12.09 hrs, Volume= 0.019 af, Depth> 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

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Area (sf)	CN	Description
2,334	80	>75% Grass cover, Good, HSG D
235	91	Gravel roads, HSG D
2,569	81	Weighted Average
2,569		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	48	0.0625	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
3.4	48	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3K:

Runoff = 0.17 cfs @ 12.09 hrs, Volume= 0.011 af, Depth> 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
1,602	80	>75% Grass cover, Good, HSG D
1,602		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	33	0.0758	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
2.3	33	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3L:

Runoff = 0.66 cfs @ 12.09 hrs, Volume= 0.051 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
4,848	98	Roofs, HSG A
4,848		100.00% Impervious Area

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

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Type III 24-hr 25-YR Rainfall=6.20"

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Summary for Subcatchment SA-3M:

Runoff = 0.75 cfs @ 12.09 hrs, Volume= 0.058 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
5,537	98	Roofs, HSG A
5,537		100.00% Impervious Area

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

Summary for Pond 1:

Inflow Area = 0.406 ac, 66.22% Impervious, Inflow Depth > 5.05" for 25-YR event
 Inflow = 2.29 cfs @ 12.09 hrs, Volume= 0.171 af
 Outflow = 2.29 cfs @ 12.09 hrs, Volume= 0.171 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.29 cfs @ 12.09 hrs, Volume= 0.171 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 113.01' @ 12.09 hrs
 Flood Elev= 115.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.10'	15.0" Round Culvert L= 19.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 112.10' / 112.00' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.23 cfs @ 12.09 hrs HW=113.00' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 2.23 cfs @ 3.30 fps)

Summary for Pond 2:

Inflow Area = 0.341 ac, 59.85% Impervious, Inflow Depth > 4.96" for 25-YR event
 Inflow = 1.91 cfs @ 12.09 hrs, Volume= 0.141 af
 Outflow = 1.91 cfs @ 12.09 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.91 cfs @ 12.09 hrs, Volume= 0.141 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 113.04' @ 12.09 hrs
 Flood Elev= 115.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.22'	15.0" Round Culvert L= 23.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 112.22' / 112.10' S= 0.0052 '/' Cc= 0.900

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n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=1.86 cfs @ 12.09 hrs HW=113.02' (Free Discharge)↑**1=Culvert** (Barrel Controls 1.86 cfs @ 3.17 fps)**Summary for Pond 11:**

Inflow Area = 0.020 ac, 100.00% Impervious, Inflow Depth > 5.51" for 25-YR event
Inflow = 0.12 cfs @ 12.09 hrs, Volume= 0.009 af
Outflow = 0.12 cfs @ 12.09 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min
Primary = 0.12 cfs @ 12.09 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 112.66' @ 12.09 hrs

Flood Elev= 115.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.49'	15.0" Round Culvert L= 23.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 112.49' / 112.26' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.12 cfs @ 12.09 hrs HW=112.65' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.12 cfs @ 1.89 fps)**Summary for Pond 12:**

Inflow Area = 0.038 ac, 100.00% Impervious, Inflow Depth > 5.51" for 25-YR event
Inflow = 0.23 cfs @ 12.09 hrs, Volume= 0.018 af
Outflow = 0.23 cfs @ 12.09 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min
Primary = 0.23 cfs @ 12.09 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 112.39' @ 12.09 hrs

Flood Elev= 115.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.16'	15.0" Round Culvert L= 16.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 112.16' / 112.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.22 cfs @ 12.09 hrs HW=112.39' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.22 cfs @ 2.15 fps)

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Summary for Pond A1:

Inflow Area = 0.631 ac, 90.12% Impervious, Inflow Depth > 5.34" for 25-YR event
 Inflow = 3.67 cfs @ 12.09 hrs, Volume= 0.281 af
 Outflow = 3.67 cfs @ 12.09 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.67 cfs @ 12.09 hrs, Volume= 0.281 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 115.36' @ 12.09 hrs

Flood Elev= 118.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	114.13'	15.0" Round Culvert L= 26.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 114.13' / 114.00' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.58 cfs @ 12.09 hrs HW=115.34' (Free Discharge)↑**1=Culvert** (Barrel Controls 3.58 cfs @ 3.75 fps)**Summary for Pond A10:**

Inflow Area = 0.062 ac, 100.00% Impervious, Inflow Depth > 5.51" for 25-YR event
 Inflow = 0.37 cfs @ 12.09 hrs, Volume= 0.029 af
 Outflow = 0.37 cfs @ 12.09 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.37 cfs @ 12.09 hrs, Volume= 0.029 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 113.19' @ 12.09 hrs

Flood Elev= 117.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.89'	15.0" Round Culvert L= 16.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 112.89' / 112.73' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.36 cfs @ 12.09 hrs HW=113.19' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.36 cfs @ 2.40 fps)**Summary for Pond A2:**

Inflow Area = 0.067 ac, 100.00% Impervious, Inflow Depth > 5.51" for 25-YR event
 Inflow = 0.39 cfs @ 12.09 hrs, Volume= 0.031 af
 Outflow = 0.39 cfs @ 12.09 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.39 cfs @ 12.09 hrs, Volume= 0.031 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 114.78' @ 12.09 hrs

Flood Elev= 118.22'

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Device	Routing	Invert	Outlet Devices
#1	Primary	114.44'	15.0" Round Culvert L= 62.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 114.44' / 114.13' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.38 cfs @ 12.09 hrs HW=114.77' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.38 cfs @ 2.19 fps)**Summary for Pond A3:**

Inflow Area = 0.506 ac, 88.38% Impervious, Inflow Depth > 5.31" for 25-YR event
Inflow = 2.93 cfs @ 12.09 hrs, Volume= 0.224 af
Outflow = 2.93 cfs @ 12.09 hrs, Volume= 0.224 af, Atten= 0%, Lag= 0.0 min
Primary = 2.93 cfs @ 12.09 hrs, Volume= 0.224 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 116.09' @ 12.09 hrs

Flood Elev= 119.21'

Device	Routing	Invert	Outlet Devices
#1	Primary	115.16'	15.0" Round Culvert L= 41.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 115.16' / 114.75' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.85 cfs @ 12.09 hrs HW=116.07' (Free Discharge)↑**1=Culvert** (Barrel Controls 2.85 cfs @ 4.15 fps)**Summary for Pond A4:**

Inflow Area = 0.047 ac, 100.00% Impervious, Inflow Depth > 5.51" for 25-YR event
Inflow = 0.28 cfs @ 12.09 hrs, Volume= 0.021 af
Outflow = 0.28 cfs @ 12.09 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 12.09 hrs, Volume= 0.021 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 116.56' @ 12.09 hrs

Flood Elev= 119.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	116.28'	15.0" Round Culvert L= 49.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 116.28' / 116.03' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.27 cfs @ 12.09 hrs HW=116.56' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.27 cfs @ 1.98 fps)

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Summary for Pond A5:

Inflow Area = 0.385 ac, 84.73% Impervious, Inflow Depth > 5.24" for 25-YR event
 Inflow = 2.21 cfs @ 12.09 hrs, Volume= 0.168 af
 Outflow = 2.21 cfs @ 12.09 hrs, Volume= 0.168 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.21 cfs @ 12.09 hrs, Volume= 0.168 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 116.77' @ 12.09 hrs

Flood Elev= 119.86'

Device	Routing	Invert	Outlet Devices
#1	Primary	116.03'	15.0" Round Culvert L= 77.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 116.03' / 115.26' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.15 cfs @ 12.09 hrs HW=116.76' (Free Discharge)

↑1=Culvert (Barrel Controls 2.15 cfs @ 4.17 fps)

Summary for Pond A6:

Inflow Area = 0.173 ac, 74.75% Impervious, Inflow Depth > 5.06" for 25-YR event
 Inflow = 0.97 cfs @ 12.09 hrs, Volume= 0.073 af
 Outflow = 0.97 cfs @ 12.09 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.97 cfs @ 12.09 hrs, Volume= 0.073 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 116.94' @ 12.09 hrs

Flood Elev= 120.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	116.39'	15.0" Round Culvert L= 52.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 116.39' / 116.13' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.94 cfs @ 12.09 hrs HW=116.93' (Free Discharge)

↑1=Culvert (Barrel Controls 0.94 cfs @ 2.75 fps)

Summary for Pond A7:

Inflow Area = 0.207 ac, 53.75% Impervious, Inflow Depth > 4.71" for 25-YR event
 Inflow = 1.10 cfs @ 12.09 hrs, Volume= 0.081 af
 Outflow = 1.10 cfs @ 12.09 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.10 cfs @ 12.09 hrs, Volume= 0.081 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 115.60' @ 12.09 hrs

Flood Elev= 118.50'

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Device	Routing	Invert	Outlet Devices
#1	Primary	115.01'	15.0" Round Culvert L= 52.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 115.01' / 114.75' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=1.07 cfs @ 12.09 hrs HW=115.59' (Free Discharge)↑**1=Culvert** (Barrel Controls 1.07 cfs @ 2.84 fps)**Summary for Pond A8:**

Inflow Area = 0.170 ac, 65.36% Impervious, Inflow Depth > 4.92" for 25-YR event
Inflow = 0.93 cfs @ 12.09 hrs, Volume= 0.070 af
Outflow = 0.93 cfs @ 12.09 hrs, Volume= 0.070 af, Atten= 0%, Lag= 0.0 min
Primary = 0.93 cfs @ 12.09 hrs, Volume= 0.070 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 115.84' @ 12.09 hrs

Flood Elev= 118.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	115.31'	15.0" Round Culvert L= 59.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 115.31' / 115.01' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.91 cfs @ 12.09 hrs HW=115.83' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.91 cfs @ 2.75 fps)**Summary for Pond A9:**

Inflow Area = 0.259 ac, 47.09% Impervious, Inflow Depth > 4.78" for 25-YR event
Inflow = 1.42 cfs @ 12.09 hrs, Volume= 0.103 af
Outflow = 1.42 cfs @ 12.09 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min
Primary = 1.42 cfs @ 12.09 hrs, Volume= 0.103 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 113.23' @ 12.09 hrs

Flood Elev= 117.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.63'	15.0" Round Culvert L= 41.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 112.63' / 112.22' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=1.38 cfs @ 12.09 hrs HW=113.22' (Free Discharge)↑**1=Culvert** (Barrel Controls 1.38 cfs @ 3.56 fps)

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Summary for Pond C1:

Inflow Area = 0.549 ac, 20.91% Impervious, Inflow Depth > 4.12" for 25-YR event
 Inflow = 2.16 cfs @ 12.19 hrs, Volume= 0.188 af
 Outflow = 2.16 cfs @ 12.19 hrs, Volume= 0.188 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.16 cfs @ 12.19 hrs, Volume= 0.188 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 116.59' @ 12.19 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	115.75'	15.0" Round Culvert L= 81.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 115.75' / 112.00' S= 0.0463 ' S= 0.0463 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.14 cfs @ 12.19 hrs HW=116.58' (Free Discharge)
 ↑1=Culvert (Inlet Controls 2.14 cfs @ 2.46 fps)

Summary for Pond SF1: SOIL FILTER 1

Inflow Area = 1.054 ac, 64.51% Impervious, Inflow Depth > 4.82" for 25-YR event
 Inflow = 5.68 cfs @ 12.09 hrs, Volume= 0.424 af
 Outflow = 1.45 cfs @ 12.46 hrs, Volume= 0.271 af, Atten= 74%, Lag= 22.5 min
 Primary = 1.31 cfs @ 12.46 hrs, Volume= 0.269 af
 Secondary = 0.15 cfs @ 12.46 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 114.78' @ 12.46 hrs Surf.Area= 7,456 sf Storage= 9,845 cf

Plug-Flow detention time= 161.3 min calculated for 0.271 af (64% of inflow)
 Center-of-Mass det. time= 85.9 min (833.1 - 747.2)

Volume	Invert	Avail.Storage	Storage Description
#1	112.50'	10,898 cf	Custom Stage Data (Irregular) Listed below (Recalc)
#2	110.17'	1,270 cf	Custom Stage Data (Irregular) Listed below (Recalc)
		6,349 cf Overall	x 20.0% Voids
		12,168 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
112.50	2,725	238.7	0	0	2,725
113.00	3,260	258.8	1,494	1,494	3,530
114.00	4,065	277.7	3,655	5,149	4,381
114.75	4,705	291.8	3,286	8,435	5,054
115.00	4,926	296.5	1,204	9,639	5,286
115.25	5,150	301.2	1,259	10,898	5,522

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
110.17	2,725	238.7	0	0	2,725
112.50	2,725	238.7	6,349	6,349	3,281

Device	Routing	Invert	Outlet Devices
#1	Device 4	114.00'	12.0" W x 4.0" H Vert. Orifice/Grate C= 0.600
#2	Device 3	110.17'	2.410 in/hr Exfiltration over Surface area
#3	Device 4	110.17'	1.0" Vert. Orifice/Grate C= 0.600
#4	Primary	110.17'	15.0" Round Culvert L= 22.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 110.17' / 110.06' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#5	Secondary	114.75'	10.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=1.31 cfs @ 12.46 hrs HW=114.78' (Free Discharge)

↳ **4=Culvert** (Passes 1.31 cfs of 11.79 cfs potential flow)
 ↳ ↳ **1=Orifice/Grate** (Orifice Controls 1.25 cfs @ 3.76 fps)
 ↳ ↳ ↳ **3=Orifice/Grate** (Orifice Controls 0.06 cfs @ 10.29 fps)
 ↳ ↳ ↳ ↳ **2=Exfiltration** (Passes 0.06 cfs of 0.42 cfs potential flow)

Secondary OutFlow Max=0.12 cfs @ 12.46 hrs HW=114.78' (Free Discharge)↳ **5=Broad-Crested Rectangular Weir** (Weir Controls 0.12 cfs @ 0.40 fps)**Summary for Pond SF2: SOIL FILTER 2**

Inflow Area = 1.084 ac, 38.92% Impervious, Inflow Depth > 4.48" for 25-YR event
 Inflow = 4.66 cfs @ 12.11 hrs, Volume= 0.405 af
 Outflow = 4.50 cfs @ 12.15 hrs, Volume= 0.337 af, Atten= 3%, Lag= 2.1 min
 Primary = 4.50 cfs @ 12.15 hrs, Volume= 0.337 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 111.81' @ 12.15 hrs Surf.Area= 3,315 sf Storage= 3,563 cf

Plug-Flow detention time= 82.0 min calculated for 0.336 af (83% of inflow)

Center-of-Mass det. time= 35.0 min (797.0 - 762.0)

Volume	Invert	Avail.Storage	Storage Description
#1	110.00'	4,696 cf	Custom Stage Data (Irregular) Listed below (Recalc)
#2	107.67'	521 cf	Custom Stage Data (Irregular) Listed below (Recalc)
			2,603 cf Overall x 20.0% Voids
			5,217 cf Total Available Storage

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
110.00	1,117	149.0	0	0	1,117
111.00	1,784	163.6	1,438	1,438	1,512
112.00	2,303	182.5	2,038	3,476	2,061
112.50	2,583	191.9	1,221	4,696	2,356

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
107.67	1,117	149.0	0	0	1,117
110.00	1,117	149.0	2,603	2,603	1,464

Device	Routing	Invert	Outlet Devices
#1	Device 4	111.50'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Device 3	107.67'	2.410 in/hr Exfiltration over Surface area
#3	Device 4	107.67'	0.7" Vert. Orifice/Grate C= 0.600
#4	Primary	107.67'	15.0" Round Culvert L= 37.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 107.67' / 106.00' S= 0.0451 ' S= 0.0451 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#5	Secondary	112.00'	10.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=4.47 cfs @ 12.15 hrs HW=111.81' (Free Discharge)

↑ **4=Culvert** (Passes 4.47 cfs of 11.07 cfs potential flow)
 ↑ **1=Orifice/Grate** (Weir Controls 4.44 cfs @ 1.81 fps)
 ↑ **3=Orifice/Grate** (Orifice Controls 0.03 cfs @ 9.76 fps)
 ↑ **2=Exfiltration** (Passes 0.03 cfs of 0.18 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=107.68' (Free Discharge)

↑ **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link AP-2:

Inflow Area = 6.953 ac, 19.15% Impervious, Inflow Depth > 3.47" for 25-YR event
 Inflow = 16.57 cfs @ 12.34 hrs, Volume= 2.008 af
 Primary = 16.57 cfs @ 12.34 hrs, Volume= 2.008 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link AP-3:

Inflow Area = 0.748 ac, 0.00% Impervious, Inflow Depth > 3.05" for 25-YR event
 Inflow = 2.02 cfs @ 12.25 hrs, Volume= 0.190 af
 Primary = 2.02 cfs @ 12.25 hrs, Volume= 0.190 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Post-Development-AP-2 & 3

Type III 24-hr 2-YR Rainfall=3.30"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-2:	Runoff Area=209,759 sf 4.77% Impervious Runoff Depth>1.23" Flow Length=660' Tc=26.9 min CN=78 Runoff=4.41 cfs 0.494 af
Subcatchment SA-2A:	Runoff Area=2,804 sf 100.00% Impervious Runoff Depth>2.87" Flow Length=190' Tc=6.0 min CN=98 Runoff=0.20 cfs 0.015 af
Subcatchment SA-2B:	Runoff Area=3,586 sf 100.00% Impervious Runoff Depth>2.87" Flow Length=190' Tc=6.0 min CN=98 Runoff=0.26 cfs 0.020 af
Subcatchment SA-2C:	Runoff Area=3,954 sf 0.00% Impervious Runoff Depth>1.37" Flow Length=40' Slope=0.1750 '/' Tc=6.0 min CN=80 Runoff=0.15 cfs 0.010 af
Subcatchment SA-2D:	Runoff Area=23,916 sf 20.91% Impervious Runoff Depth>1.64" Flow Length=223' Tc=13.7 min CN=84 Runoff=0.88 cfs 0.075 af
Subcatchment SA-2E:	Runoff Area=888 sf 100.00% Impervious Runoff Depth>2.87" Tc=6.0 min CN=98 Runoff=0.06 cfs 0.005 af
Subcatchment SA-2F:	Runoff Area=782 sf 100.00% Impervious Runoff Depth>2.87" Tc=6.0 min CN=98 Runoff=0.06 cfs 0.004 af
Subcatchment SA-3:	Runoff Area=32,582 sf 0.00% Impervious Runoff Depth>0.95" Flow Length=108' Slope=0.0370 '/' Tc=17.6 min CN=73 Runoff=0.61 cfs 0.059 af
Subcatchment SA-3A:	Runoff Area=7,214 sf 90.84% Impervious Runoff Depth>2.69" Flow Length=102' Slope=0.0069 '/' Tc=6.0 min CN=96 Runoff=0.50 cfs 0.037 af
Subcatchment SA-3B:	Runoff Area=2,033 sf 100.00% Impervious Runoff Depth>2.87" Flow Length=82' Slope=0.0201 '/' Tc=6.0 min CN=98 Runoff=0.15 cfs 0.011 af
Subcatchment SA-3C:	Runoff Area=1,985 sf 4.33% Impervious Runoff Depth>1.43" Flow Length=40' Slope=0.0150 '/' Tc=6.0 min CN=81 Runoff=0.08 cfs 0.005 af
Subcatchment SA-3D:	Runoff Area=5,267 sf 100.00% Impervious Runoff Depth>2.87" Flow Length=81' Slope=0.0172 '/' Tc=6.0 min CN=98 Runoff=0.38 cfs 0.029 af
Subcatchment SA-3E:	Runoff Area=2,898 sf 100.00% Impervious Runoff Depth>2.87" Flow Length=80' Slope=0.0225 '/' Tc=6.0 min CN=98 Runoff=0.21 cfs 0.016 af
Subcatchment SA-3F:	Runoff Area=2,559 sf 93.86% Impervious Runoff Depth>2.78" Flow Length=60' Slope=0.0200 '/' Tc=6.0 min CN=97 Runoff=0.18 cfs 0.014 af
Subcatchment SA-3G:	Runoff Area=9,411 sf 0.00% Impervious Runoff Depth>1.18" Flow Length=60' Slope=0.0875 '/' Tc=6.0 min CN=77 Runoff=0.31 cfs 0.021 af
Subcatchment SA-3H:	Runoff Area=2,721 sf 100.00% Impervious Runoff Depth>2.87" Flow Length=211' Tc=6.0 min CN=98 Runoff=0.20 cfs 0.015 af

Post-Development-AP-2 & 3

Type III 24-hr 2-YR Rainfall=3.30"

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Subcatchment SA-3I:	Runoff Area=8,561 sf 30.28% Impervious Runoff Depth>1.96" Flow Length=150' Slope=0.0140 '/' Tc=6.0 min CN=88 Runoff=0.47 cfs 0.032 af
Subcatchment SA-3J:	Runoff Area=2,569 sf 0.00% Impervious Runoff Depth>1.43" Flow Length=48' Slope=0.0625 '/' Tc=6.0 min CN=81 Runoff=0.10 cfs 0.007 af
Subcatchment SA-3K:	Runoff Area=1,602 sf 0.00% Impervious Runoff Depth>1.37" Flow Length=33' Slope=0.0758 '/' Tc=6.0 min CN=80 Runoff=0.06 cfs 0.004 af
Subcatchment SA-3L:	Runoff Area=4,848 sf 100.00% Impervious Runoff Depth>2.87" Tc=6.0 min CN=98 Runoff=0.35 cfs 0.027 af
Subcatchment SA-3M:	Runoff Area=5,537 sf 100.00% Impervious Runoff Depth>2.87" Tc=6.0 min CN=98 Runoff=0.40 cfs 0.030 af
Pond 1:	Peak Elev=112.71' Inflow=1.12 cfs 0.082 af 15.0" Round Culvert n=0.013 L=19.0' S=0.0053 '/' Outflow=1.12 cfs 0.082 af
Pond 2:	Peak Elev=112.76' Inflow=0.92 cfs 0.067 af 15.0" Round Culvert n=0.013 L=23.0' S=0.0052 '/' Outflow=0.92 cfs 0.067 af
Pond 11:	Peak Elev=112.61' Inflow=0.06 cfs 0.005 af 15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.06 cfs 0.005 af
Pond 12:	Peak Elev=112.33' Inflow=0.12 cfs 0.009 af 15.0" Round Culvert n=0.013 L=16.0' S=0.0100 '/' Outflow=0.12 cfs 0.009 af
Pond A1:	Peak Elev=114.94' Inflow=1.89 cfs 0.142 af 15.0" Round Culvert n=0.013 L=26.0' S=0.0050 '/' Outflow=1.89 cfs 0.142 af
Pond A10:	Peak Elev=113.11' Inflow=0.20 cfs 0.015 af 15.0" Round Culvert n=0.013 L=16.0' S=0.0100 '/' Outflow=0.20 cfs 0.015 af
Pond A2:	Peak Elev=114.69' Inflow=0.21 cfs 0.016 af 15.0" Round Culvert n=0.013 L=62.0' S=0.0050 '/' Outflow=0.21 cfs 0.016 af
Pond A3:	Peak Elev=115.78' Inflow=1.50 cfs 0.113 af 15.0" Round Culvert n=0.013 L=41.0' S=0.0100 '/' Outflow=1.50 cfs 0.113 af
Pond A4:	Peak Elev=116.49' Inflow=0.15 cfs 0.011 af 15.0" Round Culvert n=0.013 L=49.0' S=0.0051 '/' Outflow=0.15 cfs 0.011 af
Pond A5:	Peak Elev=116.54' Inflow=1.13 cfs 0.084 af 15.0" Round Culvert n=0.013 L=77.0' S=0.0100 '/' Outflow=1.13 cfs 0.084 af
Pond A6:	Peak Elev=116.77' Inflow=0.48 cfs 0.036 af 15.0" Round Culvert n=0.013 L=52.0' S=0.0050 '/' Outflow=0.48 cfs 0.036 af
Pond A7:	Peak Elev=115.40' Inflow=0.51 cfs 0.038 af 15.0" Round Culvert n=0.013 L=52.0' S=0.0050 '/' Outflow=0.51 cfs 0.038 af

Post-Development-AP-2 & 3

Type III 24-hr 2-YR Rainfall=3.30"

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Pond A8: Peak Elev=115.67' Inflow=0.45 cfs 0.034 af
15.0" Round Culvert n=0.013 L=59.0' S=0.0051 '/' Outflow=0.45 cfs 0.034 af

Pond A9: Peak Elev=113.02' Inflow=0.66 cfs 0.047 af
15.0" Round Culvert n=0.013 L=41.0' S=0.0100 '/' Outflow=0.66 cfs 0.047 af

Pond C1: Peak Elev=116.25' Inflow=0.88 cfs 0.075 af
15.0" Round Culvert n=0.013 L=81.0' S=0.0463 '/' Outflow=0.88 cfs 0.075 af

Pond SF1: SOIL FILTER 1 Peak Elev=114.05' Storage=6,608 cf Inflow=2.72 cfs 0.201 af
Primary=0.09 cfs 0.054 af Secondary=0.00 cfs 0.000 af Outflow=0.09 cfs 0.054 af

Pond SF2: SOIL FILTER 2 Peak Elev=111.64' Storage=3,193 cf Inflow=2.08 cfs 0.177 af
Primary=1.33 cfs 0.110 af Secondary=0.00 cfs 0.000 af Outflow=1.33 cfs 0.110 af

Link AP-2: Inflow=5.65 cfs 0.657 af
Primary=5.65 cfs 0.657 af

Link AP-3: Inflow=0.61 cfs 0.059 af
Primary=0.61 cfs 0.059 af

Total Runoff Area = 7.701 ac Runoff Volume = 0.931 af Average Runoff Depth = 1.45"
82.71% Pervious = 6.370 ac 17.29% Impervious = 1.331 ac

Post-Development-AP-2 & 3

Type III 24-hr 10-YR Rainfall=4.90"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-2:	Runoff Area=209,759 sf 4.77% Impervious Runoff Depth>2.43" Flow Length=660' Tc=26.9 min CN=78 Runoff=8.78 cfs 0.975 af
Subcatchment SA-2A:	Runoff Area=2,804 sf 100.00% Impervious Runoff Depth>4.33" Flow Length=190' Tc=6.0 min CN=98 Runoff=0.30 cfs 0.023 af
Subcatchment SA-2B:	Runoff Area=3,586 sf 100.00% Impervious Runoff Depth>4.33" Flow Length=190' Tc=6.0 min CN=98 Runoff=0.39 cfs 0.030 af
Subcatchment SA-2C:	Runoff Area=3,954 sf 0.00% Impervious Runoff Depth>2.62" Flow Length=40' Slope=0.1750 '/' Tc=6.0 min CN=80 Runoff=0.29 cfs 0.020 af
Subcatchment SA-2D:	Runoff Area=23,916 sf 20.91% Impervious Runoff Depth>2.98" Flow Length=223' Tc=13.7 min CN=84 Runoff=1.58 cfs 0.136 af
Subcatchment SA-2E:	Runoff Area=888 sf 100.00% Impervious Runoff Depth>4.33" Tc=6.0 min CN=98 Runoff=0.10 cfs 0.007 af
Subcatchment SA-2F:	Runoff Area=782 sf 100.00% Impervious Runoff Depth>4.33" Tc=6.0 min CN=98 Runoff=0.08 cfs 0.006 af
Subcatchment SA-3:	Runoff Area=32,582 sf 0.00% Impervious Runoff Depth>2.03" Flow Length=108' Slope=0.0370 '/' Tc=17.6 min CN=73 Runoff=1.35 cfs 0.126 af
Subcatchment SA-3A:	Runoff Area=7,214 sf 90.84% Impervious Runoff Depth>4.16" Flow Length=102' Slope=0.0069 '/' Tc=6.0 min CN=96 Runoff=0.76 cfs 0.057 af
Subcatchment SA-3B:	Runoff Area=2,033 sf 100.00% Impervious Runoff Depth>4.33" Flow Length=82' Slope=0.0201 '/' Tc=6.0 min CN=98 Runoff=0.22 cfs 0.017 af
Subcatchment SA-3C:	Runoff Area=1,985 sf 4.33% Impervious Runoff Depth>2.71" Flow Length=40' Slope=0.0150 '/' Tc=6.0 min CN=81 Runoff=0.15 cfs 0.010 af
Subcatchment SA-3D:	Runoff Area=5,267 sf 100.00% Impervious Runoff Depth>4.33" Flow Length=81' Slope=0.0172 '/' Tc=6.0 min CN=98 Runoff=0.57 cfs 0.044 af
Subcatchment SA-3E:	Runoff Area=2,898 sf 100.00% Impervious Runoff Depth>4.33" Flow Length=80' Slope=0.0225 '/' Tc=6.0 min CN=98 Runoff=0.31 cfs 0.024 af
Subcatchment SA-3F:	Runoff Area=2,559 sf 93.86% Impervious Runoff Depth>4.25" Flow Length=60' Slope=0.0200 '/' Tc=6.0 min CN=97 Runoff=0.27 cfs 0.021 af
Subcatchment SA-3G:	Runoff Area=9,411 sf 0.00% Impervious Runoff Depth>2.36" Flow Length=60' Slope=0.0875 '/' Tc=6.0 min CN=77 Runoff=0.63 cfs 0.043 af
Subcatchment SA-3H:	Runoff Area=2,721 sf 100.00% Impervious Runoff Depth>4.33" Flow Length=211' Tc=6.0 min CN=98 Runoff=0.29 cfs 0.023 af

Post-Development-AP-2 & 3

Type III 24-hr 10-YR Rainfall=4.90"

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Subcatchment SA-3I:	Runoff Area=8,561 sf 30.28% Impervious Runoff Depth>3.37" Flow Length=150' Slope=0.0140 '/' Tc=6.0 min CN=88 Runoff=0.79 cfs 0.055 af
Subcatchment SA-3J:	Runoff Area=2,569 sf 0.00% Impervious Runoff Depth>2.71" Flow Length=48' Slope=0.0625 '/' Tc=6.0 min CN=81 Runoff=0.20 cfs 0.013 af
Subcatchment SA-3K:	Runoff Area=1,602 sf 0.00% Impervious Runoff Depth>2.62" Flow Length=33' Slope=0.0758 '/' Tc=6.0 min CN=80 Runoff=0.12 cfs 0.008 af
Subcatchment SA-3L:	Runoff Area=4,848 sf 100.00% Impervious Runoff Depth>4.33" Tc=6.0 min CN=98 Runoff=0.52 cfs 0.040 af
Subcatchment SA-3M:	Runoff Area=5,537 sf 100.00% Impervious Runoff Depth>4.33" Tc=6.0 min CN=98 Runoff=0.59 cfs 0.046 af
Pond 1:	Peak Elev=112.88' Inflow=1.77 cfs 0.131 af 15.0" Round Culvert n=0.013 L=19.0' S=0.0053 '/' Outflow=1.77 cfs 0.131 af
Pond 2:	Peak Elev=112.92' Inflow=1.47 cfs 0.107 af 15.0" Round Culvert n=0.013 L=23.0' S=0.0052 '/' Outflow=1.47 cfs 0.107 af
Pond 11:	Peak Elev=112.64' Inflow=0.10 cfs 0.007 af 15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.10 cfs 0.007 af
Pond 12:	Peak Elev=112.37' Inflow=0.18 cfs 0.014 af 15.0" Round Culvert n=0.013 L=16.0' S=0.0100 '/' Outflow=0.18 cfs 0.014 af
Pond A1:	Peak Elev=115.18' Inflow=2.88 cfs 0.219 af 15.0" Round Culvert n=0.013 L=26.0' S=0.0050 '/' Outflow=2.88 cfs 0.219 af
Pond A10:	Peak Elev=113.16' Inflow=0.29 cfs 0.023 af 15.0" Round Culvert n=0.013 L=16.0' S=0.0100 '/' Outflow=0.29 cfs 0.023 af
Pond A2:	Peak Elev=114.74' Inflow=0.31 cfs 0.024 af 15.0" Round Culvert n=0.013 L=62.0' S=0.0050 '/' Outflow=0.31 cfs 0.024 af
Pond A3:	Peak Elev=115.96' Inflow=2.29 cfs 0.174 af 15.0" Round Culvert n=0.013 L=41.0' S=0.0100 '/' Outflow=2.29 cfs 0.174 af
Pond A4:	Peak Elev=116.53' Inflow=0.22 cfs 0.017 af 15.0" Round Culvert n=0.013 L=49.0' S=0.0051 '/' Outflow=0.22 cfs 0.017 af
Pond A5:	Peak Elev=116.67' Inflow=1.73 cfs 0.130 af 15.0" Round Culvert n=0.013 L=77.0' S=0.0100 '/' Outflow=1.73 cfs 0.130 af
Pond A6:	Peak Elev=116.86' Inflow=0.75 cfs 0.056 af 15.0" Round Culvert n=0.013 L=52.0' S=0.0050 '/' Outflow=0.75 cfs 0.056 af
Pond A7:	Peak Elev=115.51' Inflow=0.84 cfs 0.061 af 15.0" Round Culvert n=0.013 L=52.0' S=0.0050 '/' Outflow=0.84 cfs 0.061 af

Post-Development-AP-2 & 3

Type III 24-hr 10-YR Rainfall=4.90"

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Pond A8: Peak Elev=115.77' Inflow=0.72 cfs 0.053 af
15.0" Round Culvert n=0.013 L=59.0' S=0.0051 '/' Outflow=0.72 cfs 0.053 af

Pond A9: Peak Elev=113.14' Inflow=1.08 cfs 0.078 af
15.0" Round Culvert n=0.013 L=41.0' S=0.0100 '/' Outflow=1.08 cfs 0.078 af

Pond C1: Peak Elev=116.45' Inflow=1.58 cfs 0.136 af
15.0" Round Culvert n=0.013 L=81.0' S=0.0463 '/' Outflow=1.58 cfs 0.136 af

Pond SF1: SOIL FILTER 1 Peak Elev=114.39' Storage=8,049 cf Inflow=4.34 cfs 0.323 af
Primary=0.78 cfs 0.172 af Secondary=0.00 cfs 0.000 af Outflow=0.78 cfs 0.172 af

Pond SF2: SOIL FILTER 2 Peak Elev=111.75' Storage=3,443 cf Inflow=3.50 cfs 0.300 af
Primary=3.36 cfs 0.233 af Secondary=0.00 cfs 0.000 af Outflow=3.36 cfs 0.233 af

Link AP-2: Inflow=11.45 cfs 1.380 af
Primary=11.45 cfs 1.380 af

Link AP-3: Inflow=1.35 cfs 0.126 af
Primary=1.35 cfs 0.126 af

Total Runoff Area = 7.701 ac Runoff Volume = 1.724 af Average Runoff Depth = 2.69"
82.71% Pervious = 6.370 ac 17.29% Impervious = 1.331 ac

Appendix D
Water Quality Calculations and BMP Sizing

WATER QUALITY CALCULATIONS
Barra Road Subdivision
Biddeford

Subcatchment ID	Proposed Impervious Area (sq. ft.)	Proposed Lawn Area (sq. ft.)	Proposed Developed Area (sq. ft.)	Treated Impervious Area (sq. ft.)	Treated Developed Area (sq. ft.)	BMP ID
1	1,477	7,562	9,039	0	0	Untreated
1A	816		816	816	816	Soil Filter 3
1B	1,149		1,149	1,149	1,149	Soil Filter 3
1C	3,309		3,309	3,309	3,309	Soil Filter 3
1D	4,592		4,592	4,592	4,592	Soil Filter 3
1E	1,448	182	1,630	1,448	1,630	Soil Filter 3
1F	2,737	241	2,978	2,737	2,978	Soil Filter 3
1G	2,298		2,298	2,298	2,298	Soil Filter 3
1H	2,916		2,916	2,916	2,916	Soil Filter 3
1I		9,814	9,814	0	0	Untreated
1J		6,754	6,754	0	6,754	Soil Filter 3
1K		1,632	1,632	0	0	Untreated
2		9,916	9,916	0	0	Untreated
2A	2,804		2,804	2,804	2,804	Soil Filter 2
2B	3,586		3,586	3,586	3,586	Soil Filter 2
2C		3,954	3,954	0	3,954	Soil Filter 2
2D*	0	1,919	1,919	0	1,919	Soil Filter 2
2E	888		888	888	888	Soil Filter 2
2F	782		782	782	782	Soil Filter 2
Total	28,802	41,974	70,776	27,325	40,375	

* Portion of Subcatchment 2D associated with development of Subdivision

Subdivision Linear Treatment Summary	
Total Proposed Impervious Area (sq. ft.)=	28,802
Total Proposed Developed Area (sq. ft.)=	70,776
Total Treated Impervious Area (sq. ft.)=	27,325
Total Treated Developed Area (sq. ft.)=	40,375
Impervious Area Treatment % =	94.9%
Developed Area Treatment % =	57.0%

Barra Road Subdivision Biddeford - SF2 - Trailside Way Grassed Underdrain Soil Filter Calculations

Subcatchment ID	Proposed Impervious Area (ft ²)	WQ Impervious Area Runoff Depth (inches)	WQ Impervious Volume Required (ft ³)	Proposed Landscaped Area (ft ²)	Undeveloped Area (ft ²)	Undeveloped Area 50% Reduction*** (ft ²)	WQ Landscape Area Runoff Depth (inches)	WQ Landscape Volume Required (ft ³)	Total WQ Volume Required (ft ³)
2A	2,804	1.00	234	0	0	0	0.40	0	234
2B	3,586	1.00	299	0	0	0	0.40	0	299
2C	0	1.00	0	3,954	0	0	0.40	132	132
2D*	0	1.00	0	1,919	9,951	4,976	0.40	230	230
2D**	0	1.00	0	6,947	5,099	2,550	0.40	317	317
2E	888	1.00	74	0	0	0	0.40	0	74
2F	782	1.00	65	0	0	0	0.40	0	65
3H	2,721	1.00	227	0	0	0	0.40	0	227
3I	4,612	1.00	384	3,949	0	0	0.40	132	516
Total	15,393		1,283	16,769	15,050	7,525		810	2,093

* Portion of Subcatchment 2D associated with development of Subdivision

** Portion of Subcatchment 2D associated with just development of Avesta property

***Undeveloped areas routed to soil filter considered at 50% of sizing requirements based on Maine DEP Chapter 500 Section 4-C-(2)-(b)

Summary of Underdrain Filter Sizing	
Total WQ Volume Required (ft ³)	2,093
WQ Volume Provided (ft ³)	2,406
Filter Surface Elevation	110.00
WQ Surface Elevation	111.50
Invert of Underdrain	107.67
5% of Tributary Impervious Area (ft ²)	770
2% of Tributary Landscaped (ft ²)	335
Filter Surface Area Required (ft ²)	1,105
Filter Surface Area Provided (ft ²)	1,117

OK

OK

Orifice Sizing	
Discharge Coefficient	0.62
Orifice Size (inches)	0.75
Orifice Size (feet)	0.06
Orifice Area (ft ²)	0.003
Orifice Centerline Elevation	107.70

(3/4")

Orifice Eqn: $C \cdot A \cdot (2gH)^{1/2}$

Underdrain Filter Volume				
Elevation	Surface Area (ft ²)	Average Stage Area (ft ²)	Stage Volume (ft ³)	Cumulative Volume (ft ³)
110	1,117			0
111	1,784	1,451	1,451	1,451
111.5	2,036	1,910	955	2,406
112	2,303	2,170	1,085	3,490
112.5	2,583	2,443	1,222	4,712
Water Quality Volume Provided (at Elevation 111.5) =				2,406

Q (cfs)	Stage Elevation	Total Drawdown at Stage	Pond Area	Drawdown Time (hrs)
0.0231	110	0.00	1,117	0.00
0.0277	111	1.00	1,784	17.89
0.0297	111.5	0.50	2,036	9.51
Total Drawdown Time =				27.40

Required Sediment Storage			Provided Storage Volume		
Area to be Sanded	0.4	acres	Total # of CB's	6	
Sand Used per Storm	500	lbs/acre-storm	Sump Depth	2	ft
Weight of Sand	90	lbs/cf	CB Diameter	4	ft
# of Storms per Year	10	storms/year	CB Sediment Storage Volume	150.72	cf
Sediment Storage Required	19.63	cf/year	Forebay Volume	100	cf
			Total Volume	250.72	cf

Barra Road Subdivision Biddeford - SF 3 - Barra Road Grassed Underdrain Soil Filter Calculations

Subcatchment ID	Proposed Impervious Area (ft ²)	WQ Impervious Area Runoff Depth (inches)	WQ Impervious Volume Required (ft ³)	Proposed Landscaped Area (ft ²)	Undeveloped Area (ft ²)	Undeveloped Area 50% Reduction* (ft ²)	WQ Landscape Area Runoff Depth (inches)	WQ Landscape Volume Required (ft ³)	Total WQ Volume Required (ft ³)
1A	816	1.00	68	0	0	0	0.40	0	68
1B	1,149	1.00	96	0	0	0	0.40	0	96
1C	3,309	1.00	276	0	0	0	0.40	0	276
1D	4,592	1.00	383	0	0	0	0.40	0	383
1E	1,448	1.00	121	182	0	0	0.40	6	127
1F	2,737	1.00	228	241	0	0	0.40	8	236
1G	2,298	1.00	192	0	0	0	0.40	0	192
1H	2,916	1.00	243	0	0	0	0.40	0	243
1J	0	1.00	0	6,754	9,136	4,568	0.40	377	377
Total	19,265		1,605	7,177	9,136	4,568		392	1,997

*Undeveloped areas routed to soil filter considered at 50% of sizing requirements based on Maine DEP Chapter 500 Section 4-C-(2)-(b)

Summary of Underdrain Filter Sizing	
Total WQ Volume Required (ft ³)	1,997
WQ Volume Provided (ft ³)	2,725
Filter Surface Elevation	102.50
WQ Surface Elevation	104.00
Invert of Underdrain	100.17
5% of Tributary Impervious Area (ft ²)	963
2% of Tributary Landscaped (ft ²)	235
Filter Surface Area Required (ft ²)	1,198
Filter Surface Area Provided (ft ²)	1,347

OK

OK

Orifice Sizing	
Discharge Coefficient	0.62
Orifice Size (inches)	0.75
Orifice Size (feet)	0.06
Orifice Area (ft ²)	0.003
Orifice Centerline Elevation	100.20

(3/4")

Orifice Eqn: $C \cdot A \cdot (2gH)^{1/2}$

Underdrain Filter Volume				
Elevation	Surface Area (ft ²)	Average Stage Area (ft ²)	Stage Volume (ft ³)	Cumulative Volume (ft ³)
102.5	1,347			0
		1,516	758	
103	1,685			758
		1,967	1,967	
104	2,248			2,725
		2,558	2,558	
105	2,867			5,282
		3,205	3,205	
106	3,542			8,487
Water Quality Volume Provided (at Elevation 104) =				2,725

Q (cfs)	Stage Elevation	Total Drawdown at Stage	Pond Area	Drawdown Time (hrs)
0.0231	102.5	0.00	1,347	0.00
0.0255	103	0.50	1,685	9.17
0.0297	104	1.00	2,248	21.00
Total Drawdown Time =				30.18

Required Sediment Storage			Provided Storage Volume		
Area to be Sanded	0.4	acres	Total # of CB's	8	
Sand Used per Storm	500	lbs/acre-storm	Sump Depth	2	ft
Weight of Sand	90	lbs/cf	CB Diameter	4	ft
# of Storms per Year	10	storms/year	CB Sediment Storage Volume	200.96	cf
Sediment Storage Required	24.57	cf/year	Forebay Volume	53	cf
			Total Volume	253.96	cf

WATER QUALITY CALCULATIONS
Avesta Barra Road 46-Unit
Biddeford

Subcatchment ID	Proposed Impervious Area (sq. ft.)	Proposed Lawn Area (sq. ft.)	Proposed Developed Area (sq. ft.)	Treated Impervious Area (sq. ft.)	Treated Developed Area (sq. ft.)	BMP ID
2		6,458	6,458	0	0	Untreated
3		7,421	7,421	0	0	Untreated
3A	6,553	661	7,214	6,553	7,214	Soil Filter 1
3B	2,033		2,033	2,033	2,033	Soil Filter 1
3C	86	1,899	1,985	86	1,985	Soil Filter 1
3D	5,267		5,267	5,267	5,267	Soil Filter 1
3E	2,898		2,898	2,898	2,898	Soil Filter 1
3F	2,402	157	2,559	2,402	2,559	Soil Filter 1
3G		9,411	9,411	0	9,411	Soil Filter 1
3H	2,721		2,721	2,721	2,721	Soil Filter 2
3I	4,612	3,949	8,561	4,612	8,561	Soil Filter 2
3J	235	2,334	2,569	235	2,569	Soil Filter 1
3K		1,602	1,602	0	1,602	Soil Filter 1
3L	4,848		4,848	4,848	4,848	Soil Filter 1
3M	5,537		5,537	5,537	5,537	Soil Filter 1
2D*		6,947	6,947	0	6,947	Soil Filter 2
Total	37,192	40,839	78,031	37,192	64,152	

* Portion of Subcatchment 2D associated with development of Avesta property

Avesta Site Treatment Summary	
Total Proposed Impervious Area (sq. ft.)=	37,192
Total Proposed Developed Area (sq. ft.)=	78,031
Total Treated Impervious Area (sq. ft.)=	37,192
Total Treated Developed Area (sq. ft.)=	64,152
Impervious Area Treatment %* =	100.0%
Developed Area Treatment % =	82.2%

Avesta Barra Road Biddeford - SF1 - Grassed Underdrain Soil Filter Calculations

Subcatchment ID	Proposed Impervious Area (ft ²)	WQ Impervious Area Runoff Depth (inches)	WQ Impervious Volume Required (ft ³)	Proposed Landscaped Area (ft ²)	WQ Landscape Area Runoff Depth (inches)	WQ Landscape Volume Required (ft ³)	Total WQ Volume Required (ft ³)
3A	6,553	1.00	546	661	0.40	22	568
3B	2,033	1.00	169	0	0.40	0	169
3C	86	1.00	7	1,899	0.40	63	70
3D	5,267	1.00	439	0	0.40	0	439
3E	2,898	1.00	242	0	0.40	0	242
3F	2,402	1.00	200	157	0.40	5	205
3G	0	1.00	0	9,411	0.40	314	314
3J	235	1.00	20	2,334	0.40	78	97
3K	0	1.00	0	1,602	0.40	53	53
3L	4,848	1.00	404	0	0.40	0	404
3M	5,537	1.00	461	0	0.40	0	461
Total	29,859		2,488	16,064		535	3,024

Summary of Underdrain Filter Sizing	
Total WQ Volume Required (ft ³)	3,024
WQ Volume Provided (ft ³)	5,159
Filter Surface Elevation	112.50
WQ Surface Elevation	114.00
Invert of Underdrain	110.17
5% of Tributary Impervious Area (ft ²)	1,493
2% of Tributary Landscaped (ft ²)	321
Filter Surface Area Required (ft ²)	1,814
Filter Surface Area Provided (ft ²)	2,725

OK

OK

Orifice Sizing	
Discharge Coefficient	0.62
Orifice Size (inches)	1
Orifice Size (feet)	0.08
Orifice Area (ft ²)	0.005
Orifice Centerline Elevation	110.21

Orifice Eqn: $C \cdot A \cdot (2gH)^{1/2}$

Underdrain Filter Volume				
Elevation	Surface Area (ft ²)	Average Stage Area (ft ²)	Stage Volume (ft ³)	Cumulative Volume (ft ³)
112.5	2,725			0
		2,993	1,496	
113	3,260			1,496
		3,663	3,663	
114	4,065			5,159
		4,385	3,289	
114.75	4,705			8,448
		4,816	1,204	
115	4,926			9,651
Water Quality Volume Provided (at Elevation 144.5) =				5,159

Q (cfs)	Stage Elevation	Total Drawdown at Stage	Pond Area	Drawdown Time (hrs)
0.0410	112.5	0.00	2,725	0.00
0.0453	113	0.50	3,260	10.00
0.0528	114	1.00	4,065	21.39
Total Drawdown Time =				31.39

Required Sediment Storage			Provided Storage Volume	
Area to be Sanded	0.7	acres	Total # of CB's	12
Sand Used per Storm	500	lbs/acre-storm	Sump Depth	2 ft
Weight of Sand	90	lbs/cf	CB Diameter	4 ft
# of Storms per Year	10	storms/year	CB Sediment Storage Volume	301.44 cf
Sediment Storage Required	38.08	cf/year	Forebay Volume	106 cf
			Total Volume	407.44 cf

**EROSION AND SEDIMENTATION CONTROL
INSPECTION AND MAINTENANCE PLAN**

**Barra Road Subdivision
Barra Road
Biddeford, Maine**

Submitted by:

**Indian Cliff Development Corp.
260 Main Street
P.O. Box 444
Biddeford, ME**

Prepared by:



Date:
July 2024

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APPENDIX B	Construction Inspection Forms
APPENDIX C	Post-Construction Inspection Forms
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APPENDIX E	Post Construction – Maintenance of Stormwater Management Systems
APPENDIX F	Post Construction – City of Biddeford Annual Stormwater Management Facilities Certification Forms

1.0 **INTRODUCTION**

The intent of this plan is to establish inspection and maintenance procedures to be implemented for erosion and sediment control best management practices (BMP's) during construction, as well as for post-construction stormwater BMP's, for a 9 lot Subdivision. This plan has been prepared in conformance with the requirements set forth in 06-096 Chapter 500 – Stormwater Management, and the City of Biddeford Post-Construction Stormwater Management requirements.

1.1 **PROJECT DESCRIPTION**

The applicant, Indian Cliff Development Corp., is proposing a 9 lot Subdivision off the end of Barra Road in Biddeford, Maine. The project seeks to permit 7 new residential lots meeting bulk and space requirements for duplex housing to be developed by others, 1 new lot proposed to be developed by Avesta Housing, 1 new non-buildable lot supporting stormwater and access, and 2 roads meeting City requirements, to be offered to the City for acceptance. The project is required to obtain a Stormwater Law Permit from the Maine DEP and a Subdivision Permit from the City of Biddeford. The Avesta Housing property will be permitted independent of this Plan.

The scope of work includes but is not limited to:

- Tree clearing
- Stumping, grubbing and subgrade preparation.
- Construction of 2 new City Streets
- Construction of public utilities
- Construction of stormwater BMP's

The proposed development will create approximately 0.65 acres of new impervious area.

1.2 **REQUIRED PERMITS**

The following is a list of Municipal, State, and Federal permits that are required for the Project:

Municipal

City of Biddeford Subdivision Permit

State of Maine

Maine DEP Stormwater Law Permit

1.3 **REFERENCES**

This plan has been developed in accordance with the following:

- Stormwater Management Law 38 M.R.S. §420-C and §420-D
<http://legislature.maine.gov/statutes/38/title38sec420-C.html>
<http://legislature.maine.gov/statutes/38/title38sec420-D.html>
- 06-096 Chapter 500 – Stormwater Management
<http://www.maine.gov/sos/cec/rules/06/096/096c500.docx>
- General Permit – Construction Activity
Maine Pollutant Discharge Elimination System (MPDES)
<https://www.maine.gov/dep/land/stormwater/construction.html>
- Maine Erosion and Sediment Control Best Management Practices (BMPs)
Manual for Designers and Engineers
https://www.maine.gov/dep/land/erosion/escbmps/esc_bmp_engineers.pdf
- Maine Erosion and Sediment Control Practices Field Guide for Contractors
https://www.maine.gov/dep/land/erosion/escbmps/esc_bmp_field.pdf
- MaineDOT Best Management Practices for Erosion and Sedimentation Control
<https://www.maine.gov/mdot/env/documents/bmp/BMP2008full.pdf>
- City of Biddeford Maine Ordinances
<https://ecode360.com/BI3074>

1.4 **RESPONSIBLE PARTIES**

Preparer/Design Engineer: Christopher MacDonald, PE
BH2M
380B Main Street
Gorham, ME 04038
(207) 839-2771

Developer/Applicant: Indian Cliff Development Corp.
260 Main Street
P.O. Box 444
Biddeford, Maine

Site Contractor: TBD

Owner: Indian Cliff Development Corp.
260 Main Street
P.O. Box 444
Biddeford, Maine

Post Construction Stormwater Inspector: Barra Road Homeowners Association

Stormwater Maintenance Barra Road Homeowners Association

During Construction: Indian Cliff Development Corp.

Post Construction: Barra Road Homeowners Association

During construction, the Developer/Applicant or their representatives will be responsible for implementing the erosion and sediment control BMP's as well routine inspections and maintenance of the BMP's.

Post-construction stormwater BMP inspection, maintenance, reporting, and required recertifications will be the responsibility of the property owner.

1.5 INSPECTION AND MAINTENANCE – DURING CONSTRUCTION

Anyone who conducts or directs an activity that involves exposing, filling or displacing soil or other earthen materials should take appropriate measures to prevent erosion and the loss of sediment beyond the project site or into a sensitive resource. Erosion and sediment control measures should be in place before the activity begins and should remain functional until the site is permanently stabilized. All measures should remain effective until all areas are permanently stabilized. Any disturbed area should be regularly inspected until the site is fully stabilized with either 90% grass cover or a permanent impervious surface such as pavement. A person who has the knowledge of erosion and sediment control measures and of stormwater management practices should inspect the site at a minimum once a week, and before and after a storm event. Any failing measure should be repaired or modified to adequately stabilize the site prior to the next storm event or no later than 7 calendar days. The inspection frequency table found in Appendix D shall be used as a guide for inspecting each specific BMP. The inspection form found in Appendix B shall be used to record the inspection, its outcome, and the required maintenance.

Refer to the Plans found in Appendix A for additional erosion and sediment control details and narratives.

General Inspection, Maintenance, and Documentation Requirements

1. Inspection and corrective action: Inspect disturbed and impervious areas, erosion control measures, and material storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. Inspect these areas at least once a week as well as before and within 24 hours after a storm event, and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections.
2. Maintenance: If BMP's need to be repaired, the repair work should be initiated upon discovery of the problem but no later than the end of the next workday. If additional BMPs or significant repair of BMPs are necessary, implementation must be completed within 7 calendar days and prior to any storm event. All measures must be maintained in effective operating condition until areas are permanently stabilized.
3. Documentation: Maintain a binder with construction inspection forms summarizing the inspections and any corrective action taken. The forms must include the name and qualifications of the person making the inspections, the date of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicle access points to the parcel. Refer to Appendix B for the construction inspection form. Major observations must include BMP's that need maintenance, BMP's that failed to

operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the inspection form what corrective action taken and when it was taken. The Owner shall retain a copy of the inspection forms for a period of at least five years from the completion of permanent stabilization.

Site-Specific BMP's

Refer to Appendix D for inspection and maintenance requirements and frequencies of site-specific BMP's. Refer to the Plans found in Appendix A for narratives and details of the site-specific BMP's. The following is a list of the site-specific BMP's that will require routine inspection and maintenance:

- Sedimentation Barriers (Silt Fence or Erosions Control Mix Berm)
- Stabilized Construction Entrance
- Construction Limit Barrier Fence
- Stone Check Dam
- Temporary Sediment Trap
- Temporary Grass/Stone Lined Swale
- Roadways
- Snow Storage Areas
- Sediment Forebays
- Pipe Outlets
- Grassed Underdrained Soil Filter

Winter Construction

Winter construction is construction activity performed during the period from November 1 through April 15. If disturbed areas are not stabilized with permanent measures by November 1 or new soil disturbance occurs after November 1, but before April 15, then these areas must be protected and runoff from them must be controlled by additional measures and restrictions.

1. Site Stabilization: For winter stabilization, hay mulch is applied at twice the standard temporary stabilization rate. At the end of each construction day, areas that have been brought to final grade must be stabilized. Mulch may not be spread on top of snow.
2. Sediment Barriers: All areas within 75 feet of a protected natural resource must be protected with a double row of sediment barriers.
3. Ditches: All vegetated ditch lines that have not been stabilized by November 1, or will be worked during the winter construction period, must be stabilized with an appropriate stone lining backed by an appropriate gravel bed or geotextile unless specifically released from this standard by Maine DEP.

-
4. Slopes: Mulch netting must be used to anchor mulch on all slopes greater than 8% unless erosion control blankets or erosion control mix is being used on these slopes.

Refer to the Plans contained in Appendix A for additional winter construction erosion and sediment control requirements.

1.6 INSPECTION AND MAINTENANCE – POST-CONSTRUCTION

The long-term operation and maintenance of a stormwater management system is as critical to its performance as its design and construction. Proper operation and maintenance practices ensure that stormwater BMP's continue to improve water quality by removing pollutants effectively over the long-term and decreasing the risk of re-suspending sediment. Without proper maintenance, BMPs are likely to fail and will no longer provide treatment of stormwater. The following includes a summary of the inspection, maintenance, and documentation requirements for post-construction stormwater BMP's.

Refer to the Plans contained in Appendix A for details and locations of site-specific post-construction BMP's and Appendix F for Annual Stormwater Management Facilities Certification form for the City of Biddeford. See section 5. below for addition information on City requirements.

General Inspection, Maintenance, and Documentation Requirements

1. Inspection and maintenance: All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections. The following areas, facilities, and measures must be inspected and identified deficiencies must be corrected. Areas, facilities, and measures other than those listed below may also require inspection on a specific site.
 - a) Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after significant rainfall events (1 inch in 24-hour period) to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.
 - b) Inspect ditches, swales and other open stormwater channels in the spring, in late fall, and after significant rainfall events (1 inch in 24-hour period) to remove any obstructions to flow, remove accumulated sediments and debris, to control vegetated growth that could obstruct flow, and to repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If

the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or side slopes.

- c) Inspect culverts in the spring, in late fall, and after heavy rains to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.
- d) Inspect at least once per year, each underdrained soil filter, including the filter embankments, vegetation, underdrain piping, and overflow spillway. Remove and dispose of accumulated sediments in the filter. If needed, rehabilitate any clogged surface linings, and flush underdrain piping.

2. Regular maintenance

- 1. Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader. Grading of gravel roads, or grading of the gravel shoulders of gravel or paved roads, must be routinely performed to ensure that stormwater drains immediately off the road surface to adjacent buffer areas or stable ditches, and is not impeded by accumulations of graded material on the road shoulder or by excavation of false ditches in the shoulder. If water bars or open-top culverts are used to divert runoff from road surfaces, clean-out any sediments within or at the outlet of these structures to restore their function.
- 3. Documentation: Maintain a binder of inspection forms summarizing inspection, maintenance, and any corrective actions taken. The inspection forms must include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. Refer to Appendix C for inspection forms. If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed of after removal. The log must be made accessible to Department staff and a copy provided to the Department upon request. The Owner shall retain a copy of the logs for a period of at least five years from the completion of permanent stabilization.
- 4. The site-specific post-construction BMP's for the project include the following:
 - Vegetated swales
 - Roadways and shoulders

-
- Storm Drain System
 - Snow storage areas
 - Rip rap inlet and outlet aprons
 - Sediment forebay
 - Pipe outlets
 - Grassed Underdrained Soil Filter
5. The City of Biddeford requires that annual inspections of the stormwater facilities be made on a yearly basis by a Qualified Post-Construction Stormwater Inspector, with annual inspections being reported to the City Engineer by March 1st of each year, per Chapter 34 Article VI “Post-Construction Stormwater Discharge” of the City’s code of Ordinances. See Attachment F for the current copy the Annual Stormwater Management Facilities Certification form for use in reporting these inspections to the City.

1.7 **HOUSEKEEPING**

The following performance standards shall apply:

1. Spill prevention: Controls must be used to prevent pollutants from construction and waste materials stored on site to enter stormwater, which includes storage practices to minimize exposure of the materials to stormwater. The site contractor or operator must develop and implement as necessary appropriate spill prevention, containment, and response planning measures.

NOTE: Any spill or release of toxic or hazardous substances must be reported to the Department. For oil spills, call 1-800-482-0777 which is available 24 hours a day. For

spills of toxic or hazardous material, call 1-800-452-4664 which is available 24 hours a day. For more information, visit the Department’s website at :

<http://www.maine.gov/dep/spills/emergspillresp/>

2. Groundwater protection: During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials. Any project proposing infiltration of stormwater must provide adequate pre-treatment of stormwater prior to discharge of stormwater to the infiltration area, or provide for treatment within the infiltration area in order to prevent the accumulation of fines, reduction in infiltration rate, and consequent flooding and destabilization.

See 06-096 Chapter 500 - Appendix D for license by rule standards for infiltration of stormwater.

NOTE: Lack of appropriate pollutant removal best management practices (BMPs) may result in violations of the groundwater quality standard established by 38 M.R.S.A. §465-C(1).

3. Fugitive sediment and dust: Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control, but other water additives may be considered as needed. A stabilized construction entrance (SCE) should be included to minimize tracking of mud and sediment. If off-site tracking occurs, public roads should be swept immediately, no less than once a week, and prior to significant storm events. Operations during dry months that experience fugitive dust problems, should wet down unpaved access roads once a week or more frequently as needed with a water additive to suppress fugitive sediment and dust.

NOTE: Take care in sourcing water. Dewatering a stream without a permit from the Department may violate state water quality standards and the *Natural Resources Protection Act*.

4. Debris and other materials: Minimize the exposure of construction debris, building and landscaping materials, trash, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials to precipitation and stormwater runoff. These materials must be prevented from becoming a pollutant source.

NOTE: To prevent these materials from becoming a source of pollutants, construction and post-construction activities related to a project may be required to comply with applicable provision of rules related to solid, universal, and hazardous waste, including, but not limited to, the Maine solid waste and hazardous waste management rules; Maine hazardous waste management rules; Maine oil conveyance and storage rules; and Maine pesticide requirements.

5. Excavation de-watering: Excavation de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water removed from the ponded area, either through gravity or pumping, must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the Department.

NOTE: Dewatering controls are discussed in the “Maine Erosion and Sediment

6. Authorized Non-stormwater discharges: Identify and prevent contamination by non-stormwater discharges. Where allowed non-stormwater discharges exist, they must be identified and steps should be taken to ensure the implementation of appropriate pollution prevention measures for the non-stormwater component(s) of the discharge. Authorized non-stormwater discharges are:
 - a) Discharges from firefighting activity;
 - b) Fire hydrant flushings;
 - c) Vehicle washwater if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited);
 - d) Dust control runoff in accordance with permit conditions;
 - e) Routine external building washdown, not including surface paint removal, that does not involve detergents;
 - f) Pavement washwater (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material had been removed) if detergents are not used;
 - g) Uncontaminated air conditioning or compressor condensate;
 - h) Uncontaminated groundwater or spring water;
 - i) Foundation or footer drain-water where flows are not contaminated;
 - j) Uncontaminated excavation dewatering;
 - k) Potable water sources including waterline flushings; and
 - l) Landscape irrigation.
7. Unauthorized non-stormwater discharges: The Department’s approval under this Chapter does not authorize a discharge that is mixed with a source of non-stormwater, other than those discharges in compliance with 06-096 Chapter 500 - Appendix C (6). Specifically, the Department’s approval does not authorize discharges of the following:
 - a) Wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;
 - b) Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;
 - c) Soaps, solvents, or detergents used in vehicle and equipment washing; and
 - d) Toxic or hazardous substances from a spill or other release.
8. Additional requirements: Additional requirements may be applied on a site-specific basis.

Appendix A
Plans

Appendix B
Construction Inspection Forms

CONSTRUCTION INSPECTION FORM FOR EROSION AND SEDIMENT CONTROL						
General Information:						
Site Name:		Date:		Inspected by:		
Owner:						
Retained 3PI:		Last Rain Date:			Amount:	
Reason for Inspection:		Weekly	Winter	Final	Rain Event	Complaint
Description of disturbed area:						
Photos:						
	YES/NO/NA	COMMENTS				
1. Is an Erosion and Sediment Control Plan available?						
ESC plan on-site and followed						
Other:						
2. Are all erosion control practices installed properly, maintained and functioning?						
Disturbed areas stable						
Concentrated flow inlet/outlet protection						
All areas at final grade						
Disturbed dormant areas stabilized						
Access roads and parking						
Hillsides and stockpiles						
Other:						
3. Are all sedimentation control practices installed properly, maintained and functioning?						
Construction entrance						
Sedimentation basins/traps/diversions						
Perimeter controls						
Check dams						
Other:						
4. Is maintenance of ESC measures, construction activities and housekeeping kept-up?						
Sedimentation/erosion in ditches						
Tracked Sediment or dust at exits						
Hazardous material storage and spill control practices						
Waste management (concrete, hazardous material, etc.)						
Other:						
5. Violation, Corrective Actions, Recommendations						
Sediment discharged from site?						
Corrective action required?						
Site compliant with all permits?						
Notice of violation or stop work order issued?						
Comments/Corrective Actions (complete corrective actions before the next rain event and within 7 day)						

Appendix C
Post-Construction Inspection Forms

Barra Road Subdivision Biddeford Post-Construction Inspection Form (Ditches, Swales and Open Stormwater Channels)						
Project name:		Date:		Inspected by:		
Owner name:						
Last rain date:		Amount:				
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
General description of BMP condition/recent maintenance performed:						
Photos: (Attach)						
Inspection Details		Comments		Maintenance Required		
Obstructions, sediment or debris noticeable in ditch line?						
Mowing required?						
Woody vegetation apparent in ditches?						
Side slopes stable? Signs of slumping?						
Rip rap stable? Underlying filter fabric visible?						
Additional Comments:						

Barra Road Subdivision Biddeford Post-Construction Inspection Form (Roadway and Parking Areas)					
Project name:		Date:		Inspected by:	
Owner name:					
Last rain date:		Amount:			
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed
					Other (Specify)
General description of BMP condition/recent maintenance performed:					
Photos: (Attach)					
Inspection Details		Comments		Maintenance Required	
Winter sand accumulation apparent?					
Pavement Sweeping required?					
Gravel shoulders graded appropriately?					
Gravel road grading required?					
Low spots causing puddling?					
Additional Comments:					

Barra Road Subdivision Biddeford Post-Construction Inspection Form (Storm Drain System including culverts)					
Project name:		Date:		Inspected by:	
Owner name:					
Last rain date:		Amount:			
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed
					Other (Specify)
General description of BMP condition/recent maintenance performed:					
Photos: (Attach)					
Inspection Details		Comments		Maintenance Required	
Accumulated debris or sediment at inlet, outlet, or within culvert/storm drain?					
Flow obstructions present?					
Erosion apparent at culvert inlet/outlet?					
Additional Comments:					

Barra Road Subdivision Biddeford Post-Construction Inspection Form (Underdrain Filter)						
Project name:		Date:		Inspected by:		
Owner name:						
Last rain date:		Amount:				
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
General description of BMP condition/recent maintenance performed:						
Photos: (Attach)						
Inspection Details		Comments		Maintenance Required		
Debris apparent in basin bottom?						
Vegetation established in basin bottom?						
Basin draining within 72 hours?						
Inlet forebay rip rap stable and free of debris?						
Embankment and side slopes stable? Sloughs or unvegetated areas apparent?						
Outlet free of debris? Rip rap stable?						
Valve in operating condition?						
Outlet control structure operational free of debris?						
Orifice free of debris and operational?						
Additional Comments:						

Barra Road Subdivision Biddeford Post-Construction Inspection Form (Vegetated Area)					
Project name:		Date:		Inspected by:	
Owner name:					
Last rain date:		Amount:			
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed
					Other (Specify)
General description of BMP condition/recent maintenance performed:					
Photos: (Attach)					
Inspection Details		Comments		Maintenance Required	
All slopes and embankments well vegetated? Signs of sparse growth?					
Rill erosion apparent in vegetated areas?					
Downs slope of level spreaders/ditch turnouts stable?					
Mowing of vegetated areas appropriate?					
Additional Comments:					

Appendix D
Inspection Frequency Checklist and Long-Term Inspection & Maintenance Plan

EROSION AND SEDIMENT CONTROL MEASURES AND ACTIVITY	INSPECTION FREQUENCY		
	Weekly	Before and After a Storm	After Construction
SEDIMENT BARRIERS			
Sediment barriers are installed prior to soil disturbances	X	X	
Silt fences are keyed in and tight	X	X	
Barriers are repaired and replaced as necessary	X	X	
Barriers are removed when the site is stabilized - Silt fence should be cut at the ground surface			X
TEMPORARY STABILIZATION			
Areas are stabilized if idle for 14 days or more	X	X	
Daily stabilization within 100 ft of a natural resource	X	X	
MULCH			
Seed and mulch within 7 days of final grading. Ground is not visible	X	X	
Erosion control mix is 4-6 inch thick	X	X	
Erosion control blankets or hay mulch are anchored	X	X	
VEGETATION			
Vegetation provides 90% soil cover	X		X
Loam or soil amendment were provided	X		X
New seeded areas are mulched and protected from vehicle, foot traffic and runoff	X	X	X
Areas that will remain unworked for more than 1 year are vegetated with grass	X		
SLOPES AND EMBANKMENTS			
Final graded slopes and embankments are stabilized	X	X	X
Diversions are provided for areas with rill erosion	X	X	X
Areas steeper than 2:1 are riprapped	X		
Stones are angular, durable and various in size	X		
Riprap is underlain with a gravel layer or filter fabric	X		
STORMWATER CHANNELS AND CULVERTS			
Ditches and swales are permanently stabilized—channels that will be riprapped have been over-excavated	X	X	X
Ditches are clear of obstructions, accumulated sediments or debris	X	X	X
Ditch lining/bottoms are free of erosion	X	X	X
Check dams are spaced correctly to slow flow velocity	X		
Underlying filter fabric or gravel is not visible	X	X	X
Culvert aprons and plunge pools are sized for expected flows volume and velocity	X		
Stones are angular, durable and various in size	X		
Culverts are sized to avoid upgradient flooding	X	X	
Culvert protection extends to the maximum flow elevation within the ditch	X	X	X
Culvert is embedded, not hanging	X	X	X

ROADWAYS AND PARKING SURFACES			
The gravel pad at the construction entrance is clear from sediments	X	X	
Roads are graded to drain		X	X
Cross drainage (culvert) is provided	X		
False ditches (from winter sand) are graded		X	X
BUFFERS			
Buffers are free of erosion or concentrated flows		X	X
The downgradient of spreaders and turnouts is stable		X	X
Level spreaders are on the contour			X
The number of spreaders and ditch turnouts is adequate for flow distribution		X	X
Any sediment accumulation is removed from within spreader or turnouts		X	X
WINTER CONSTRUCTION (November 1st-April 15th)			
Final graded areas are mulched daily at twice the normal rate with hay, and anchor (not on snow)	Daily		
A double row of sediment barrier is provided for all areas within 100 ft of a sensitive resource (use erosion control mix on frozen ground)	Daily		
Newly constructed ditches are riprapped	Daily		
Slopes greater than 8% are covered with an erosion control blanket or a 4-inch layer of erosion control mix	Daily		
HOUSEKEEPING PUNCH LIST			
All disturbed areas are permanently stabilized, and plantings are established (grass seeds have germinated with 90% vegetative cover)			X
All trash, sediments, debris or any solid waste have been removed from stormwater channels, catch basins, detention structures, discharge points, etc.			X
All ESC devices have been removed: (silt fence and posts, diversions and sediment structures, etc.)			X
All deliverables (certifications, survey information, as-built plans, reports, notice of termination (NOT), etc.) in accordance with all permit requirements have been submitted to town, Maine DEP, association, owner, etc.			X

INSPECTION AND MAINTENANCE PLAN FOR STORMWATER MANAGEMENT STRUCTURES (BMPS)

	INSPECTION SCHEDULE	CORRECTIVE ACTIONS
VEGETATED AREAS	Annually early spring and after heavy rains	Inspect all slopes and embankments and replant areas of bare soil or with sparse growth
		Armor rill erosion areas with riprap or divert the runoff to a stable area
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Mow vegetation as specified for the area
DITCHES, SWALES AND OPEN STORMWATER CHANNELS	Annually spring and late fall and after heavy rains	Remove obstructions, sediments or debris from ditches, swales and other open channels
		Repair any erosion of the ditch lining
		Mow vegetated ditches
		Remove woody vegetation growing through riprap
		Repair any slumping side slopes
		Repair riprap where underlying filter fabric or gravel is showing or if stones have dislodge
CULVERTS	Spring and late fall and after heavy rains	Remove accumulated sediments and debris at the inlet, outlet, or within the conduit
		Remove any obstruction to flow
		Repair any erosion damage at the culvert's inlet and outlet
ROADWAYS AND PARKING AREAS	Annually in the spring or as needed	Clear and remove accumulated winter sand in parking lots and along roadways
		Sweep pavement to remove sediment
		Grade road shoulders and remove accumulated winter sand
		Grade gravel roads and gravel shoulders
		Clean out the sediment within water bars or open-top culverts
RESOURCE AND TREATMENT BUFFERS	Annually in the spring	Ensure that stormwater runoff is not impeded by false ditches of sediment in the shoulder
		Inspect buffers for evidence of erosion, concentrated flow, or encroachment by development
		Manage the buffer's vegetation with the requirements in any deed restrictions
		Repair any sign of erosion within a buffer
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Install more level spreaders, or ditch turn-outs if needed for a better distribution of flow
OTHER PRACTICES	As specified for devices	Clean out any accumulation of sediment within the spreader bays or turnout pools
		Mow non-wooded buffers no shorter than six inches and less than three times per year
		Contact the department for appropriate inspection and maintenance requirements for other drainage control and runoff treatment measures.

Appendix E
Post Construction – Maintenance of Stormwater Management Systems

FIVE-YEAR RECERTIFICATION FOR LONG-TERM MAINTENANCE OF STORMWATER MANAGEMENT SYSTEMS

For Site Location & Stormwater Projects

This form complies with the condition that requires reporting every 5 years on the long-term maintenance of stormwater management structures of projects permitted under the Stormwater Management Law since 2005. Complete the following sections, include inspection photos, and use additional paper if needed. A copy of the report if the inspection was performed by a professional experienced in BMP maintenance should be included. Electronic copy of this form and information about the five-year recertification are available on the Maine DEP website at: <http://www.maine.gov/dep/land/stormwater/stormwaterbmps/>

Please type or print in black ink only			
Owner/Licensee		3rd Party Inspection Company (if applicable)	
Name of Representative:		Name of Inspector or preparer of report:	
Company:		Company:	
Mailing Address:		Mailing Address:	
Daytime Phone #:		Daytime Phone #:	
E-mail Address:		E-mail Address:	

LOCATION OF DEVELOPMENT			
Name of Project:			
Address and Town:			
DEP Permit Number:		Year of Permit:	

PROJECT SPECIFICS	
If the project is unfinished, please describe its current status and your plans for the future. The filing of this report of on-site long-term maintenance activities is still required.	
If the project is within a MPDES Regulated Town, the maintenance report prepared for the town should be submitted with this form.	
If the project is a subdivision with a Homeowner's association, identify the responsible party.	
Confirm that the required recording of deed restrictions for the protection of buffers or conservation land has been done, and that the buffers are maintained according to the restrictions.	
Identify the contractor for the required renewal of a 5-year maintenance contract for the inspection, cleaning and maintenance of manufactured proprietary structures.	
Is a maintenance log available for review?	

LONG-TERM MAINTENANCE (please comment on the following):

All areas of the development have been inspected for erosion, and appropriate steps have been taken to permanently stabilize these areas.

All stormwater control structures have been inspected for damage, wear, malfunction, and appropriate steps have been taken to repair or replace the failing systems.

The erosion control and stormwater maintenance plan for the site is being implemented as written, and a maintenance log has been created and is being maintained.

CERTIFICATIONS/SIGNATURES

By signing below, the owner (or authorized agent) certifies that all stormwater management structures at the project described above are stable and operational as designed.

Signed: _____ Title _____ Date: _____

This completed form and all supporting documents summarized above shall be sent to the following address. An emailed report is appropriate and should be sent to Recert-DEP@maine.gov

Five-year Recertification
Bureau of Land Resources
17 State House Station
Augusta, ME 04333
Tel: (207) 287-2624 or (207) 287-2602

Appendix F
Post Construction – City of Biddeford Annual Stormwater Management Facilities
Certification Forms

ENVIRONMENT

34 Attachment 2

City of Biddeford

Appendix 1

**Annual Stormwater Management Facilities Certification (to be sent to City's
Enforcement Authority)
[Amended 6-20-2023 by Ord. No. 2023.61¹]**

- I, _____ (print or type name), certify the following:
1. I am making this Annual Stormwater Management Facilities Certification for the following property:
_____ (print or type name of subdivision, condominium or other development) located at _____ (print or type address), (the "Property");
 2. The owner, operator, tenant, lessee or homeowners' association of the Property is: _____ (name(s) of owner, operator, tenant, lessee, homeowners' association or other party having control over the Property);
 3. I am (check one)
 - a. _____ the owner, operator, tenant, lessee or president of the homeowners' association and have hired a Qualified Post Construction Stormwater Inspector; or
 - b. _____ am a Qualified Post-Construction Stormwater Inspector hired by the person identified in item two of this form;
 4. I have knowledge of erosion and stormwater control and have reviewed the approved Post-Construction Stormwater Management Plan for the Property;
 5. On _____, 20 _____, I inspected or had inspected by a Qualified Post-Construction Stormwater Inspector, the Stormwater Management Facilities, including but not limited to parking areas, catch basins, drainage swales, detention basins and ponds, pipes and related structures required by the approved Post-Construction Stormwater Management Plan for the Property;
 6. I have attached a copy of the Annual Inspection Report. At the time of the inspection (check one and complete any required information):
 - a. The Stormwater Management Facilities were adequately maintained and functioning as intended; or
 - b. The Stormwater Management Facilities required maintenance, which was completed within the required sixty-day time period, and were functioning as intended after maintenance was completed; or
 - c. The Stormwater Management Facilities required maintenance which was not completed within the required sixty-day time period. (Attach additional sheets as necessary to describe the maintenance required, proposed schedule for completion, and an appropriate contact person. The City will contact them to confirm or adjust the schedule to complete the maintenance and any needed further course of action. You will be required to show proof of final maintenance.)

¹ Editor's Note: This ordinance also repealed former Appendix 1, Maintenance Agreement for Stormwater Management Facilities, and redesignated former Appendix 2 as Appendix 1.

BIDDEFORD CODE

Date: _____, 20.

By: _____

Signature

Print Name

Mail this certification to the City's Enforcement Authority at the following address [to be completed by the municipality]: _____

**EROSION AND SEDIMENTATION CONTROL
INSPECTION AND MAINTENANCE PLAN**

**Avesta Housing
Barra Road
Biddeford, Maine**

Submitted by:

**Avesta Housing
307 Cumberland Avenue
Portland, ME**

Prepared by:



Date:
July 2024

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APPENDIX F	Post Construction – City of Biddeford Annual Stormwater Management Facilities Certification Forms

1.0 INTRODUCTION

The intent of this plan is to establish inspection and maintenance procedures to be implemented for erosion and sediment control best management practices (BMP's) during construction, as well as for post-construction stormwater BMP's, for a 46-unit affordable elderly housing project for Avesta Housing. This plan has been prepared in conformance with the requirements set forth in 06-096 Chapter 500 – Stormwater Management, and the City of Biddeford Post-Construction Stormwater Management requirements.

1.1 PROJECT DESCRIPTION

The applicant, Avesta Housing, is proposing a 46-unit apartment building off the end of Barra Road in Biddeford, Maine. This project is proposed as part of a subdivision by Indian Cliff Development Corp. on Lot A of the subdivision approximately 2.2 acres in size. The project is required to obtain a Stormwater Law Permit from the Maine DEP and a Site and Subdivision Permit from the City of Biddeford.

The scope of work includes but is not limited to:

- Tree clearing
- Stumping, grubbing and subgrade preparation.
- Grading of lot and construction of access and parking
- Construction of a 46-unit 4 story apartment building
- Construction of public utilities
- Construction of stormwater BMP's

The proposed development will create approximately 0.84 acres of new impervious area.

1.2 REQUIRED PERMITS

The following is a list of Municipal, State, and Federal permits that are required for the Project:

Municipal

City of Biddeford Site and Subdivision Permits

State of Maine

Maine DEP Stormwater Law Permit

1.3 **REFERENCES**

This plan has been developed in accordance with the following:

- Stormwater Management Law 38 M.R.S. §420-C and §420-D
<http://legislature.maine.gov/statutes/38/title38sec420-C.html>
<http://legislature.maine.gov/statutes/38/title38sec420-D.html>
- 06-096 Chapter 500 – Stormwater Management
<http://www.maine.gov/sos/cec/rules/06/096/096c500.docx>
- General Permit – Construction Activity
Maine Pollutant Discharge Elimination System (MPDES)
<https://www.maine.gov/dep/land/stormwater/construction.html>
- Maine Erosion and Sediment Control Best Management Practices (BMPs)
Manual for Designers and Engineers
https://www.maine.gov/dep/land/erosion/escbmps/esc_bmp_engineers.pdf
- Maine Erosion and Sediment Control Practices Field Guide for Contractors
https://www.maine.gov/dep/land/erosion/escbmps/esc_bmp_field.pdf
- MaineDOT Best Management Practices for Erosion and Sedimentation Control
<https://www.maine.gov/mdot/env/documents/bmp/BMP2008full.pdf>
- City of Biddeford Maine Ordinances
<https://ecode360.com/BI3074>

1.4 **RESPONSIBLE PARTIES**

Preparer/Design Engineer:	Christopher MacDonald, PE BH2M 380B Main Street Gorham, ME 04038 (207) 839-2771
Developer/Applicant:	Avesta Housing 307 Cumberland Avenue Portland, ME
Site Contractor:	<u>TBD</u> _____ _____
Owner:	Indian Cliff Development Corp. 260 Main Street P.O. Box 444 Biddeford, Maine
Post Construction Stormwater Inspector:	<u>Avesta Housing</u> _____ _____
Stormwater Maintenance	<u>Avesta Housing</u> _____ _____
During Construction:	<u>Avesta Housing</u> _____ _____
Post Construction:	<u>Avesta Housing</u> _____ _____

During construction, the Developer/Applicant or their representatives will be responsible for implementing the erosion and sediment control BMP's as well routine inspections and maintenance of the BMP's.

Post-construction stormwater BMP inspection, maintenance, reporting, and required recertifications will be the responsibility of the property owner.

1.5 INSPECTION AND MAINTENANCE – DURING CONSTRUCTION

Anyone who conducts or directs an activity that involves exposing, filling or displacing soil or other earthen materials should take appropriate measures to prevent erosion and the loss of sediment beyond the project site or into a sensitive resource. Erosion and sediment control measures should be in place before the activity begins and should remain functional until the site is permanently stabilized. All measures should remain effective until all areas are permanently stabilized. Any disturbed area should be regularly inspected until the site is fully stabilized with either 90% grass cover or a permanent impervious surface such as pavement. A person who has the knowledge of erosion and sediment control measures and of stormwater management practices should inspect the site at a minimum once a week, and before and after a storm event. Any failing measure should be repaired or modified to adequately stabilize the site prior to the next storm event or no later than 7 calendar days. The inspection frequency table found in Appendix D shall be used as a guide for inspecting each specific BMP. The inspection form found in Appendix B shall be used to record the inspection, its outcome, and the required maintenance.

Refer to the Plans found in Appendix A for additional erosion and sediment control details and narratives.

General Inspection, Maintenance, and Documentation Requirements

1. Inspection and corrective action: Inspect disturbed and impervious areas, erosion control measures, and material storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. Inspect these areas at least once a week as well as before and within 24 hours after a storm event, and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections.
2. Maintenance: If BMP's need to be repaired, the repair work should be initiated upon discovery of the problem but no later than the end of the next workday. If additional BMPs or significant repair of BMPs are necessary, implementation must be completed within 7 calendar days and prior to any storm event. All measures must be maintained in effective operating condition until areas are permanently stabilized.
3. Documentation: Maintain a binder with construction inspection forms summarizing the inspections and any corrective action taken. The forms must include the name and qualifications of the person making the inspections, the date of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicle access points to the parcel. Refer to Appendix B for the construction inspection form. Major observations must include BMP's that need maintenance, BMP's that failed to

operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the inspection form what corrective action taken and when it was taken. The Owner shall retain a copy of the inspection forms for a period of at least five years from the completion of permanent stabilization.

Site-Specific BMP's

Refer to Appendix D for inspection and maintenance requirements and frequencies of site-specific BMP's. Refer to the Plans found in Appendix A for narratives and details of the site-specific BMP's. The following is a list of the site-specific BMP's that will require routine inspection and maintenance:

- Sedimentation Barriers (Silt Fence or Erosions Control Mix Berm)
- Stabilized Construction Entrance
- Construction Limit Barrier Fence
- Stone Check Dam
- Temporary Sediment Trap
- Temporary Grass/Stone Lined Swale
- Roadways
- Snow Storage Areas
- Sediment Forebays
- Pipe Outlets
- Grassed Underdrained Soil Filter

Winter Construction

Winter construction is construction activity performed during the period from November 1 through April 15. If disturbed areas are not stabilized with permanent measures by November 1 or new soil disturbance occurs after November 1, but before April 15, then these areas must be protected and runoff from them must be controlled by additional measures and restrictions.

1. Site Stabilization: For winter stabilization, hay mulch is applied at twice the standard temporary stabilization rate. At the end of each construction day, areas that have been brought to final grade must be stabilized. Mulch may not be spread on top of snow.
2. Sediment Barriers: All areas within 75 feet of a protected natural resource must be protected with a double row of sediment barriers.
3. Ditches: All vegetated ditch lines that have not been stabilized by November 1, or will be worked during the winter construction period, must be stabilized with an appropriate stone lining backed by an appropriate gravel bed or geotextile unless specifically released from this standard by Maine DEP.

-
4. Slopes: Mulch netting must be used to anchor mulch on all slopes greater than 8% unless erosion control blankets or erosion control mix is being used on these slopes.

Refer to the Plans contained in Appendix A for additional winter construction erosion and sediment control requirements.

1.6 INSPECTION AND MAINTENANCE – POST-CONSTRUCTION

The long-term operation and maintenance of a stormwater management system is as critical to its performance as its design and construction. Proper operation and maintenance practices ensure that stormwater BMP's continue to improve water quality by removing pollutants effectively over the long-term and decreasing the risk of re-suspending sediment. Without proper maintenance, BMPs are likely to fail and will no longer provide treatment of stormwater. The following includes a summary of the inspection, maintenance, and documentation requirements for post-construction stormwater BMP's.

Refer to the Plans contained in Appendix A for details and locations of site-specific post-construction BMP's and Appendix F for Annual Stormwater Management Facilities Certification form for the City of Biddeford. See section 5. below for addition information on City requirements.

General Inspection, Maintenance, and Documentation Requirements

1. Inspection and maintenance: All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections. The following areas, facilities, and measures must be inspected and identified deficiencies must be corrected. Areas, facilities, and measures other than those listed below may also require inspection on a specific site.
 - a) Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after significant rainfall events (1 inch in 24-hour period) to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.
 - b) Inspect ditches, swales and other open stormwater channels in the spring, in late fall, and after significant rainfall events (1 inch in 24-hour period) to remove any obstructions to flow, remove accumulated sediments and debris, to control vegetated growth that could obstruct flow, and to repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If

the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or side slopes.

- c) Inspect culverts in the spring, in late fall, and after heavy rains to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.
- d) Inspect at least once per year, each underdrained soil filter, including the filter embankments, vegetation, underdrain piping, and overflow spillway. Remove and dispose of accumulated sediments in the filter. If needed, rehabilitate any clogged surface linings, and flush underdrain piping.

2. Regular maintenance

- 1. Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader. Grading of gravel roads, or grading of the gravel shoulders of gravel or paved roads, must be routinely performed to ensure that stormwater drains immediately off the road surface to adjacent buffer areas or stable ditches, and is not impeded by accumulations of graded material on the road shoulder or by excavation of false ditches in the shoulder. If water bars or open-top culverts are used to divert runoff from road surfaces, clean-out any sediments within or at the outlet of these structures to restore their function.
- 3. Documentation: Maintain a binder of inspection forms summarizing inspection, maintenance, and any corrective actions taken. The inspection forms must include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. Refer to Appendix C for inspection forms. If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed of after removal. The log must be made accessible to Department staff and a copy provided to the Department upon request. The Owner shall retain a copy of the logs for a period of at least five years from the completion of permanent stabilization.
- 4. The site-specific post-construction BMP's for the project include the following:
 - Vegetated swales
 - Roadways and shoulders

-
- Storm Drain System
 - Snow storage areas
 - Rip rap inlet and outlet aprons
 - Sediment forebay
 - Pipe outlets
 - Grassed Underdrained Soil Filter
5. The City of Biddeford requires that annual inspections of the stormwater facilities be made on a yearly basis by a Qualified Post-Construction Stormwater Inspector, with annual inspections being reported to the City Engineer by March 1st of each year, per Chapter 34 Article VI “Post-Construction Stormwater Discharge” of the City’s code of Ordinances. See Attachment F for the current copy the Annual Stormwater Management Facilities Certification form for use in reporting these inspections to the City.

1.7 **HOUSEKEEPING**

The following performance standards shall apply:

1. Spill prevention: Controls must be used to prevent pollutants from construction and waste materials stored on site to enter stormwater, which includes storage practices to minimize exposure of the materials to stormwater. The site contractor or operator must develop and implement as necessary appropriate spill prevention, containment, and response planning measures.

NOTE: Any spill or release of toxic or hazardous substances must be reported to the Department. For oil spills, call 1-800-482-0777 which is available 24 hours a day. For

spills of toxic or hazardous material, call 1-800-452-4664 which is available 24 hours a day. For more information, visit the Department’s website at :

<http://www.maine.gov/dep/spills/emergspillresp/>

2. Groundwater protection: During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials. Any project proposing infiltration of stormwater must provide adequate pre-treatment of stormwater prior to discharge of stormwater to the infiltration area, or provide for treatment within the infiltration area in order to prevent the accumulation of fines, reduction in infiltration rate, and consequent flooding and destabilization.

See 06-096 Chapter 500 - Appendix D for license by rule standards for infiltration of stormwater.

NOTE: Lack of appropriate pollutant removal best management practices (BMPs) may result in violations of the groundwater quality standard established by 38 M.R.S.A. §465-C(1).

3. Fugitive sediment and dust: Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control, but other water additives may be considered as needed. A stabilized construction entrance (SCE) should be included to minimize tracking of mud and sediment. If off-site tracking occurs, public roads should be swept immediately, no less than once a week, and prior to significant storm events. Operations during dry months that experience fugitive dust problems, should wet down unpaved access roads once a week or more frequently as needed with a water additive to suppress fugitive sediment and dust.

NOTE: Take care in sourcing water. Dewatering a stream without a permit from the Department may violate state water quality standards and the *Natural Resources Protection Act*.

4. Debris and other materials: Minimize the exposure of construction debris, building and landscaping materials, trash, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials to precipitation and stormwater runoff. These materials must be prevented from becoming a pollutant source.

NOTE: To prevent these materials from becoming a source of pollutants, construction and post-construction activities related to a project may be required to comply with applicable provision of rules related to solid, universal, and hazardous waste, including, but not limited to, the Maine solid waste and hazardous waste management rules; Maine hazardous waste management rules; Maine oil conveyance and storage rules; and Maine pesticide requirements.

5. Excavation de-watering: Excavation de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water removed from the ponded area, either through gravity or pumping, must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the Department.

NOTE: Dewatering controls are discussed in the “Maine Erosion and Sediment Control BMPs, Maine Department of Environmental Protection.”

-
6. Authorized Non-stormwater discharges: Identify and prevent contamination by non-stormwater discharges. Where allowed non-stormwater discharges exist, they must be identified and steps should be taken to ensure the implementation of appropriate pollution prevention measures for the non- stormwater component(s) of the discharge. Authorized non-stormwater discharges are:
- a) Discharges from firefighting activity;
 - b) Fire hydrant flushings;
 - c) Vehicle washwater if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited);
 - d) Dust control runoff in accordance with permit conditions;
 - e) Routine external building washdown, not including surface paint removal, that does not involve detergents;
 - f) Pavement washwater (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material had been removed) if detergents are not used;
 - g) Uncontaminated air conditioning or compressor condensate;
 - h) Uncontaminated groundwater or spring water;
 - i) Foundation or footer drain-water where flows are not contaminated;
 - j) Uncontaminated excavation dewatering;
 - k) Potable water sources including waterline flushings; and
 - l) Landscape irrigation.
7. Unauthorized non-stormwater discharges: The Department's approval under this Chapter does not authorize a discharge that is mixed with a source of non-stormwater, other than those discharges in compliance with 06-096 Chapter 500 - Appendix C (6). Specifically, the Department's approval does not authorize discharges of the following:
- a) Wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;
 - b) Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;
 - c) Soaps, solvents, or detergents used in vehicle and equipment washing; and
 - d) Toxic or hazardous substances from a spill or other release.
8. Additional requirements: Additional requirements may be applied on a site-specific basis.

Appendix A
Plans

Appendix B
Construction Inspection Forms

CONSTRUCTION INSPECTION FORM FOR EROSION AND SEDIMENT CONTROL						
General Information:						
Site Name:		Date:		Inspected by:		
Owner:						
Retained 3PI:		Last Rain Date:		Amount:		
Reason for Inspection:		Weekly	Winter	Final	Rain Event	Complaint
Description of disturbed area:						
Photos:						
	YES/NO/NA	COMMENTS				
1. Is an Erosion and Sediment Control Plan available?						
ESC plan on-site and followed						
Other:						
2. Are all erosion control practices installed properly, maintained and functioning?						
Disturbed areas stable						
Concentrated flow inlet/outlet protection						
All areas at final grade						
Disturbed dormant areas stabilized						
Access roads and parking						
Hillsides and stockpiles						
Other:						
3. Are all sedimentation control practices installed properly, maintained and functioning?						
Construction entrance						
Sedimentation basins/traps/diversions						
Perimeter controls						
Check dams						
Other:						
4. Is maintenance of ESC measures, construction activities and housekeeping kept-up?						
Sedimentation/erosion in ditches						
Tracked Sediment or dust at exits						
Hazardous material storage and spill control practices						
Waste management (concrete, hazardous material, etc.)						
Other:						
5. Violation, Corrective Actions, Recommendations						
Sediment discharged from site?						
Corrective action required?						
Site compliant with all permits?						
Notice of violation or stop work order issued?						
Comments/Corrective Actions (complete corrective actions before the next rain event and within 7 day)						

Appendix C
Post-Construction Inspection Forms

Avesta Housing Biddeford Post-Construction Inspection Form (Ditches, Swales and Open Stormwater Channels)					
Project name:		Date:		Inspected by:	
Owner name:					
Last rain date:		Amount:			
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed
					Other (Specify)
General description of BMP condition/recent maintenance performed:					
Photos: (Attach)					
Inspection Details		Comments		Maintenance Required	
Obstructions, sediment or debris noticeable in ditch line?					
Mowing required?					
Woody vegetation apparent in ditches?					
Side slopes stable? Signs of slumping?					
Rip rap stable? Underlying filter fabric visible?					
Additional Comments:					

Avesta Housing Biddeford Post-Construction Inspection Form (Roadway and Parking Areas)						
Project name:		Date:		Inspected by:		
Owner name:						
Last rain date:		Amount:				
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
General description of BMP condition/recent maintenance performed:						
Photos: (Attach)						
Inspection Details		Comments		Maintenance Required		
Winter sand accumulation apparent?						
Pavement Sweeping required?						
Gravel shoulders graded appropriately?						
Gravel road grading required?						
Low spots causing puddling?						
Additional Comments:						

Avesta Housing Biddeford Post-Construction Inspection Form (Storm Drain System including culverts)					
Project name:		Date:		Inspected by:	
Owner name:					
Last rain date:		Amount:			
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed
					Other (Specify)
General description of BMP condition/recent maintenance performed:					
Photos: (Attach)					
Inspection Details		Comments		Maintenance Required	
Accumulated debris or sediment at inlet, outlet, or within culvert/storm drain?					
Flow obstructions present?					
Erosion apparent at culvert inlet/outlet?					
Additional Comments:					

Avesta Housing Biddeford Post-Construction Inspection Form (Underdrain Filter)						
Project name:		Date:		Inspected by:		
Owner name:						
Last rain date:		Amount:				
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
General description of BMP condition/recent maintenance performed:						
Photos: (Attach)						
Inspection Details		Comments		Maintenance Required		
Debris apparent in basin bottom?						
Vegetation established in basin bottom?						
Basin draining within 72 hours?						
Inlet forebay rip rap stable and free of debris?						
Embankment and side slopes stable? Sloughs or unvegetated areas apparent?						
Outlet free of debris? Rip rap stable?						
Valve in operating condition?						
Outlet control structure operational free of debris?						
Orifice free of debris and operational?						
Additional Comments:						

Avesta Housing Biddeford Post-Construction Inspection Form (Vegetated Area)						
Project name:		Date:		Inspected by:		
Owner name:						
Last rain date:		Amount:				
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
General description of BMP condition/recent maintenance performed:						
Photos: (Attach)						
Inspection Details		Comments		Maintenance Required		
All slopes and embankments well vegetated? Signs of sparse growth?						
Rill erosion apparent in vegetated areas?						
Downs slope of level spreaders/ditch turnouts stable?						
Mowing of vegetated areas appropriate?						
Additional Comments:						

Appendix D
Inspection Frequency Checklist and Long-Term Inspection & Maintenance Plan

EROSION AND SEDIMENT CONTROL MEASURES AND ACTIVITY	INSPECTION FREQUENCY		
	Weekly	Before and After a Storm	After Construction
SEDIMENT BARRIERS			
Sediment barriers are installed prior to soil disturbances	X	X	
Silt fences are keyed in and tight	X	X	
Barriers are repaired and replaced as necessary	X	X	
Barriers are removed when the site is stabilized - Silt fence should be cut at the ground surface			X
TEMPORARY STABILIZATION			
Areas are stabilized if idle for 14 days or more	X	X	
Daily stabilization within 100 ft of a natural resource	X	X	
MULCH			
Seed and mulch within 7 days of final grading. Ground is not visible	X	X	
Erosion control mix is 4-6 inch thick	X	X	
Erosion control blankets or hay mulch are anchored	X	X	
VEGETATION			
Vegetation provides 90% soil cover	X		X
Loam or soil amendment were provided	X		X
New seeded areas are mulched and protected from vehicle, foot traffic and runoff	X	X	X
Areas that will remain unworked for more than 1 year are vegetated with grass	X		
SLOPES AND EMBANKMENTS			
Final graded slopes and embankments are stabilized	X	X	X
Diversions are provided for areas with rill erosion	X	X	X
Areas steeper than 2:1 are riprapped	X		
Stones are angular, durable and various in size	X		
Riprap is underlain with a gravel layer or filter fabric	X		
STORMWATER CHANNELS AND CULVERTS			
Ditches and swales are permanently stabilized—channels that will be riprapped have been over-excavated	X	X	X
Ditches are clear of obstructions, accumulated sediments or debris	X	X	X
Ditch lining/bottoms are free of erosion	X	X	X
Check dams are spaced correctly to slow flow velocity	X		
Underlying filter fabric or gravel is not visible	X	X	X
Culvert aprons and plunge pools are sized for expected flows volume and velocity	X		
Stones are angular, durable and various in size	X		
Culverts are sized to avoid upgradient flooding	X	X	
Culvert protection extends to the maximum flow elevation within the ditch	X	X	X
Culvert is embedded, not hanging	X	X	X

ROADWAYS AND PARKING SURFACES			
The gravel pad at the construction entrance is clear from sediments	X	X	
Roads are graded to drain		X	X
Cross drainage (culvert) is provided	X		
False ditches (from winter sand) are graded		X	X
BUFFERS			
Buffers are free of erosion or concentrated flows		X	X
The downgradient of spreaders and turnouts is stable		X	X
Level spreaders are on the contour			X
The number of spreaders and ditch turnouts is adequate for flow distribution		X	X
Any sediment accumulation is removed from within spreader or turnouts		X	X
WINTER CONSTRUCTION (November 1st-April 15th)			
Final graded areas are mulched daily at twice the normal rate with hay, and anchor (not on snow)	Daily		
A double row of sediment barrier is provided for all areas within 100 ft of a sensitive resource (use erosion control mix on frozen ground)	Daily		
Newly constructed ditches are riprapped	Daily		
Slopes greater than 8% are covered with an erosion control blanket or a 4-inch layer of erosion control mix	Daily		
HOUSEKEEPING PUNCH LIST			
All disturbed areas are permanently stabilized, and plantings are established (grass seeds have germinated with 90% vegetative cover)			X
All trash, sediments, debris or any solid waste have been removed from stormwater channels, catch basins, detention structures, discharge points, etc.			X
All ESC devices have been removed: (silt fence and posts, diversions and sediment structures, etc.)			X
All deliverables (certifications, survey information, as-built plans, reports, notice of termination (NOT), etc.) in accordance with all permit requirements have been submitted to town, Maine DEP, association, owner, etc.			X

INSPECTION AND MAINTENANCE PLAN FOR STORMWATER MANAGEMENT STRUCTURES (BMPS)

	INSPECTION SCHEDULE	CORRECTIVE ACTIONS
VEGETATED AREAS	Annually early spring and after heavy rains	Inspect all slopes and embankments and replant areas of bare soil or with sparse growth
		Armor rill erosion areas with riprap or divert the runoff to a stable area
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Mow vegetation as specified for the area
DITCHES, SWALES AND OPEN STORMWATER CHANNELS	Annually spring and late fall and after heavy rains	Remove obstructions, sediments or debris from ditches, swales and other open channels
		Repair any erosion of the ditch lining
		Mow vegetated ditches
		Remove woody vegetation growing through riprap
		Repair any slumping side slopes
		Repair riprap where underlying filter fabric or gravel is showing or if stones have dislodge
CULVERTS	Spring and late fall and after heavy rains	Remove accumulated sediments and debris at the inlet, outlet, or within the conduit
		Remove any obstruction to flow
		Repair any erosion damage at the culvert's inlet and outlet
ROADWAYS AND PARKING AREAS	Annually in the spring or as needed	Clear and remove accumulated winter sand in parking lots and along roadways
		Sweep pavement to remove sediment
		Grade road shoulders and remove accumulated winter sand
		Grade gravel roads and gravel shoulders
		Clean out the sediment within water bars or open-top culverts
RESOURCE AND TREATMENT BUFFERS	Annually in the spring	Ensure that stormwater runoff is not impeded by false ditches of sediment in the shoulder
		Inspect buffers for evidence of erosion, concentrated flow, or encroachment by development
		Manage the buffer's vegetation with the requirements in any deed restrictions
		Repair any sign of erosion within a buffer
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Install more level spreaders, or ditch turn-outs if needed for a better distribution of flow
OTHER PRACTICES	As specified for devices	Clean out any accumulation of sediment within the spreader bays or turnout pools
		Mow non-wooded buffers no shorter than six inches and less than three times per year
		Contact the department for appropriate inspection and maintenance requirements for other drainage control and runoff treatment measures.

Appendix E
Post Construction – Maintenance of Stormwater Management Systems

FIVE-YEAR RECERTIFICATION FOR LONG-TERM MAINTENANCE OF STORMWATER MANAGEMENT SYSTEMS

For Site Location & Stormwater Projects

This form complies with the condition that requires reporting every 5 years on the long-term maintenance of stormwater management structures of projects permitted under the Stormwater Management Law since 2005. Complete the following sections, include inspection photos, and use additional paper if needed. A copy of the report if the inspection was performed by a professional experienced in BMP maintenance should be included. Electronic copy of this form and information about the five-year recertification are available on the Maine DEP website at: <http://www.maine.gov/dep/land/stormwater/stormwaterbmps/>

Please type or print in black ink only			
Owner/Licensee		3rd Party Inspection Company (if applicable)	
Name of Representative:		Name of Inspector or preparer of report:	
Company:		Company:	
Mailing Address:		Mailing Address:	
Daytime Phone #:		Daytime Phone #:	
E-mail Address:		E-mail Address:	

LOCATION OF DEVELOPMENT			
Name of Project:			
Address and Town:			
DEP Permit Number:		Year of Permit:	

PROJECT SPECIFICS	
If the project is unfinished, please describe its current status and your plans for the future. The filing of this report of on-site long-term maintenance activities is still required.	
If the project is within a MPDES Regulated Town, the maintenance report prepared for the town should be submitted with this form.	
If the project is a subdivision with a Homeowner's association, identify the responsible party.	
Confirm that the required recording of deed restrictions for the protection of buffers or conservation land has been done, and that the buffers are maintained according to the restrictions.	
Identify the contractor for the required renewal of a 5-year maintenance contract for the inspection, cleaning and maintenance of manufactured proprietary structures.	
Is a maintenance log available for review?	

LONG-TERM MAINTENANCE (please comment on the following):

All areas of the development have been inspected for erosion, and appropriate steps have been taken to permanently stabilize these areas.

All stormwater control structures have been inspected for damage, wear, malfunction, and appropriate steps have been taken to repair or replace the failing systems.

The erosion control and stormwater maintenance plan for the site is being implemented as written, and a maintenance log has been created and is being maintained.

CERTIFICATIONS/SIGNATURES

By signing below, the owner (or authorized agent) certifies that all stormwater management structures at the project described above are stable and operational as designed.

Signed: _____ Title _____ Date: _____

This completed form and all supporting documents summarized above shall be sent to the following address. An emailed report is appropriate and should be sent to Recert-DEP@maine.gov

Five-year Recertification
Bureau of Land Resources
17 State House Station
Augusta, ME 04333
Tel: (207) 287-2624 or (207) 287-2602

Appendix F
Post Construction – City of Biddeford Annual Stormwater Management Facilities
Certification Forms

ENVIRONMENT

34 Attachment 2

City of Biddeford

Appendix 1

**Annual Stormwater Management Facilities Certification (to be sent to City's
Enforcement Authority)
[Amended 6-20-2023 by Ord. No. 2023.61¹]**

- I, _____ (print or type name), certify the following:
1. I am making this Annual Stormwater Management Facilities Certification for the following property:
_____ (print or type name of subdivision, condominium or other
development) located at _____ (print or type address), (the
"Property");
 2. The owner, operator, tenant, lessee or homeowners' association of the Property is: _____
(name(s) of owner, operator, tenant, lessee, homeowners' association or other party having control
over the Property);
 3. I am (check one)
 - a. _____ the owner, operator, tenant, lessee or president of the homeowners' association and have
hired a Qualified Post Construction Stormwater Inspector; or
 - b. _____ am a Qualified Post-Construction Stormwater Inspector hired by the person identified in
item two of this form;
 4. I have knowledge of erosion and stormwater control and have reviewed the approved Post-
Construction Stormwater Management Plan for the Property;
 5. On _____, 20 _____, I inspected or had inspected by a Qualified Post-Construction
Stormwater Inspector, the Stormwater Management Facilities, including but not limited to parking
areas, catch basins, drainage swales, detention basins and ponds, pipes and related structures required
by the approved Post-Construction Stormwater Management Plan for the Property;
 6. I have attached a copy of the Annual Inspection Report. At the time of the inspection (check one and
complete any required information):
 - a. The Stormwater Management Facilities were adequately maintained and functioning as
intended; or
 - b. The Stormwater Management Facilities required maintenance, which was completed within the
required sixty-day time period, and were functioning as intended after maintenance was
completed; or
 - c. The Stormwater Management Facilities required maintenance which was not completed within
the required sixty-day time period. (Attach additional sheets as necessary to describe the
maintenance required, proposed schedule for completion, and an appropriate contact person.
The City will contact them to confirm or adjust the schedule to complete the maintenance and
any needed further course of action. You will be required to show proof of final maintenance.)

¹ Editor's Note: This ordinance also repealed former Appendix 1, Maintenance Agreement for
Stormwater Management Facilities, and redesignated former Appendix 2 as Appendix 1.

BIDDEFORD CODE

Date: _____, 20.

By: _____

Signature

Print Name

Mail this certification to the City's Enforcement Authority at the following address [to be completed by the municipality]: _____

Appendix G
Maine DEP Stormwater Application Checklist



DEPARTMENT OF ENVIRONMENTAL PROTECTION

STORMWATER APPLICATION CHECKLIST

Applicant: Indian Cliff Development Corp. & Avesta Housing		
Project Name: Barra Road Subdivision		
Town: Biddeford		
Application Type:	☐ Stormwater	☐ Site Law
Watershed Name: Thatcher Brook		
Watershed Type:	☒ UIS	☐ Phosphorus ☐ Neither

Project Area Information

	Existing to Remain ¹	New / Proposed	Total
Impervious (Im)	0	1.52 Acres	1.52Acres
Landscaped (Land)	0	1.90 Acres	1.90 Acres
Developed (Dev) ²	0	3.42 Acres	3.42 Acres

1- If area is not subject to treatment, provide reason and show in a separate column in the Water Quality Calc table.

2- Developed area = Impervious Area + Landscaped Area

A. BASIC STANDARD

1. Erosion and Sedimentation Controls (Appendix A, page 32 of Chapter 500:

<https://www.maine.gov/sos/cec/rules/06/096/096c500.docx>)

- Guidance in Department [ESC BMP Manuals](#)

2. Inspection & Maintenance (Appendix B, page 37 of Chapter 500)

Construction Phase: Show on Plans the following:

- Responsibility for inspection and maintenance
- Construction schedule (how long will it take and in what sequence/critical path to build)
- Inspection frequency
- Scope of inspection
- Inspector qualifications
- Define storm event that triggers a wet weather inspection (0.5" of rain in 24 hours)
- Documentation (3 years minimum)

Post-Construction: Include in written I&M Plan the following:

- Responsibility for inspection and maintenance
- Inspection frequency for each BMP
- Inspection form for each BMP
- Inspector qualifications
- Define storm event that triggers a wet weather inspection (1" of rain in 24 hours)
- Documentation (5 years, minimum)
- Project is subject to Department 5-Year Recertification

3. Good Housekeeping (Appendix C, page 41 of Chapter 500)

- Show all seven elements on Plans.

B. GENERAL STANDARD

Must provide the following on WQ Treatment Plan: All BMPs with subcatchments including time of concentration (Tc) lines, flow lengths and flow types.

1. Soil Explorations (test pit completed by a certified soil scientist) at each proposed BMP

- Include test pit summary table on detail plan.
- If there is potential ledge, address in design.
- If shallow groundwater, address in design.

2. Treatment Standards (modify to fit project): Fill out the following table for the applicable standards that apply.

Applicable Standard	Section in Ch. 500	Required Treatment (Im / Dev)	Area Eligible		Area Treated		Provided Treatment %	
			Im	Dev	Im	Dev	Im	Dev
General Standard	4(C)(2)(a)(i)	95% / 80%	0.85	1.79	0.85	1.47	100.0	82.2
Increased Runoff Treated ¹	4(C)(2)(a)(ii)	90% / 80% min	0	0	0	0	0	0
% Parcel Developed ²	4(C)(2)(a)(iii)	90% / 75% min	0	0	0	0	0	0
Redevelopment ³ (Dev Area)	4(C)(2)(d)	0% min (SW) 50% min (Site)	0	0	0	0	0	0
Linear	4(C)(5)(c)	75% / 50% min	0.66	1.63	0.63	0.93	94.9	57.0
Other: Offsite Treatment/Mitigation			0	0	0	0	0	0
Project Total Area =			1.51	3.42	1.48	2.40	98.0	70.2

1- If proposing to treat more than the first flush, state why meeting Ch. 500, § 4(C)(2)(a)(i) is not practicable.

2- Reduced % based on portion of parcel developed.

3- Include pollutant impact ranking calculations (current and proposed) and a figure showing the Redevelopment window.

3. Proposed BMPs: Please provide the following information on the Table below for EACH BMP.

BMPs Proposed	#	Pretreatment	Sizing calcs	Detail on Plans ¹	CPV Draindown Time	HydroCAD
Soil Filter	3	Yes	Yes	Yes	Yes	Yes

1- BMP details (cross sections, elevation sections, plan view)

Link to Stormwater Design BMP Volumes I, II, III

<https://www.maine.gov/dep/land/stormwater/stormwaterbmps/index.html>

- Provide Construction Oversight Notes.
- If BMP is unlined, review and satisfy (Appendix E Sections 4(b) and 4(c), page 50 of Chapter 500).
- Treatment buffers (Appendix F, page 56 of Chapter 500): must provide sample deed restriction (Appendix G, page 64 of Chapter 500).
- Infiltration must satisfy Appendix D, page 44 of Chapter 500.
- Is conveyance designed to a 10-year, 24-hour storm?
- Is a drainage easement required for any areas to be flooded?
- Discharge to a public storm sewer system: Must provide authorization from the authority.

If proposing Proprietary BMPs, provide:

- Letter from vendor approving sizing and siting
<https://www.maine.gov/dep/land/stormwater/stormwaterbmps/index.html>.
- Executed 5-Year I&M Agreement with a provider approved by vendor.
- Narrative section and specific inspection forms in the written I&M Plan.
- Pervious pavement: Must provide Executed 5-Year I&M Agreement and vacuum equipment used.

C. PHOSPHORUS STANDARD

MUST provide on the WQ Treatment Plan: BMPs with subcatchments including time of concentration (Tc) lines, flow lengths and flow types;

Provide export calculations clearly showing distinct BMPs: Phosphorus Table Calculations

[Worksheet 4 july 2015.xlsx](#).

D. FLOODING STANDARD

1. Add pre- and post- peak flow rates table to post development plan for storms (2-, 10-, 25-year).
2. Is primary access road passable up to a 25-year, 24-hour storm?
3. If requesting a waiver of the Flooding Standard, must state justification for the waiver.
4. HydroCad or other runoff model
 - If post peak flow rate is > pre-peak flow, a waiver request will be needed with justification Ch. 500, § 4(F)(3)(a) or (b),
 - If discharging to wetland see Chap. 500, § 4(I).

This checklist has been designed by DEP stormwater engineers as a guidance tool to assist applicants and their consultants when preparing stormwater applications. Completing the checklist is recommended and valuable, but it is not a substitute for reviewing Ch. 500, and completing all the items on the checklist does not automatically mean all the Ch. 500 requirements have been satisfied. The contents of Ch. 500 should be reviewed carefully for the applicable requirements that apply to your proposed project.

I have reviewed this checklist and included in my submission all the required elements of this checklist that apply to the proposed project.

Maine Engineer of Record:



Signature

July 12, 2024

Date

Christopher R. MacDonald P.E. Maine # 11985

Name (print)



June 7, 2024

ATTN: Christopher MacDonald, PE
BH2M
380B Main Street
Gorham, ME 04038

Re: Ability to Serve Determination – Barra Road Subdivision, Biddeford

Greetings,

The Maine Water Company (MWC) has received your request on the behalf of your client, Indian Cliff Development Corp., for an Ability to Serve Determination for the above-referenced subdivision. The request specifies a plan to construct a residential subdivision to include a 46-unit senior housing facility on Lot A, 7 duplexes (one per lot) on Lots B-G & J, and associated utility infrastructure improvements. Your client intends to extend water services from the existing main located in Barra Road. The expected domestic service demand is 9,000 gallons per day. The expected fire service demand is currently unknown.

Domestic water is available for your project from the existing 12-inch ductile iron main in the Barra Road Right-of-Way (ROW) to serve a main extension for the proposed development. Based on the criteria provided by the developer's agent, the expected increase in water usage is within the Biddeford Saco Division of MWC's available system capacity. The static pressure in the area is approximately **60 psi**. Additional infrastructure improvements may be required at the expense of the developer to meet the overall needs of this project.

Conditions of Service

- The development will require a public main extension to serve the proposed development. A utility sheet will be required to show utility placement and separation, including hydrants, services, valves, blow off assemblies, and other waterline appurtenances.
- MWC will require inspection during installation of the new public main and private service line connections at the expense of the developer.
- Additional plan approval, paperwork, and fees associated with services and main extensions in this area will require proper coordination with MWC. MWC requires upfront payment for inspection and paperwork to be fully completed before any construction on waterworks materials.
- Allow 30 days for the MWC utility review process to be completed before construction on waterworks materials will be approved.
- Proposed hydrants located in the public ROW must be accepted by the City of Biddeford and approved by the local fire authority.
- An easement for access and operation of all water service valves on this property must be signed, notarized, and registered with the county registry before activation. MWC will draft and supply this document to be executed by the owner.
- MWC has the understanding that fire service demand is unknown at this time, are not be included in this request, or accounted for in this Ability to Serve Determination.
- If fire services are required, a hydrant flow test at the nearest available hydrant will need to be conducted and analyzed by the sprinkler designer to ensure that adequate flows can be met during a peak fire demand event.
- The developer is required to pay for the cost of any modification, renewal of impacted service lines, and retirement of unused or discontinued services to MWC standards of best practice.
- Additional plan approval, paperwork, and fees associated with this project will require proper coordination with MWC. MWC requires upfront payment for inspection and paperwork to be fully completed before any construction on waterworks materials.
- Service lines must comply with MWC Cross Connection Control Program.

Should a request for service or completion of the project not be executed within one year of the date of this letter, MWC reserves the right to reevaluate its ability to serve this project.

All work must be completed in accordance with MWC Terms and Conditions as well as material specifications. All appropriate paperwork must be completed, and deposit paid prior to the start of construction. Please forward all design plan revisions as the project develops to prevent construction delays. Water service will be provided in accordance with Maine Public Utility Commission rules. If you have any additional questions, please do not hesitate to contact our office at 1-800-287-1643 or by email at Patrick.Gere@mainewater.com. We look forward to working with you throughout design and construction.

Sincerely,
The Maine Water Company


Patrick Gere, PE
Project Engineer

CITY OF BIDDEFORD - SITE PLAN APPLICATION DRAWING CHECKLIST

LAST REVISED: 04/18/23

CHECKLIST DIRECTIONS:

1. The following checklist must be completely filled out by the applicant for any Site Plan submittal to the Planning Department.
2. Applicant to confirm all of the items listed are included within the submittal. Any missing items must have adequate reasoning to justify their absence.
3. City to review applicant's submittal and checklist responses. Projects missing submittal information with non-acceptable reasoning will be rejected.
4. Items in **BLACK** are required for 'Preliminary Site Plan' approval & 'Final Site Plan' approval.
5. Items in **BLUE** are only required for 'Final Site Plan' approval.

SUBMITTAL INFORMATION - TO BE FILLED OUT BY APPLICANT	
Project Name:	Barra Road Subdivision
Planning Board # (if available):	2024.21
Applicant Name/Info:	Indian Cliff Development Corp
Submittal #/Type (Prelim/Final):	Final Subdivision Application
Submittal Date:	17-Jul-24

SUBMITTAL REQUIREMENT		APPLICANT RESPONSE		CITY REVIEW RESPONSE	
ITEM NUMBER	DESCRIPTION	INFORMATION PROVIDED (YES/NO)	REASON NOT PROVIDED/COMMENT	ACCEPTABLE (YES/NO-REVISE & RESUBMIT)	COMMENT
1	GENERAL PLAN REQUIREMENTS				
A	Drawing specific legends (linetypes, hatches, etc.)	Yes			
B	Individual drawing layer control should be utilized: freeze/thawing, changing lineweights, and screening (i.e. screen existing layers on a proposed plan, freeze topography and underground utilities on a proposed site plan)	Yes			
C	North arrows, standard engineering scale viewports, dated revision blocks	Yes			
D	All drawings and surveys must be in the following coordinate systems: NAD83 Maine State Plane West (Horizontal) and NAVD88 (Vertical)	Yes			
E	Drawings need to be designed, signed & sealed by a Maine licensed professional engineer (PE); all boundary survey data needs to be performed by a licensed professional land surveyor (PLS)	Yes			
2	COVER SHEET				
A	Project Name & Property Address	Yes			
B	Project Team Contact Information (Owner, Engineer, Contractor, etc.)	Yes			
C	Site Location Map	Yes			
D	Sheet Set List of Drawings	Yes			
E	Tax Map and Lot ID	Yes			
F	Zoning & Shoreland Zone Information	Yes			
G	Existing Use Description	Yes			
H	Proposed Use Description	Yes			
I	Required Waiver/Variances (Yes/No); if yes, plan must clearly list waivers/variances requesting	Yes	See cover letter for details on waivers being requested		
J	Name of Drainage Watershed	Yes	Thatcher Brook		
K	Within the MS4 Urbanized Area (Yes/No)	Yes			
L	Natural resources (streams, wetlands, etc.) located on-site or adjacent to the property (Yes/No)	Yes			
M	Within the 100-year Flood Zone (Yes/No)	Yes			
N	Public Road Proposed (Yes/No)	Yes			
O	Private Road Proposed (Yes/No)	No			
P	Public Sewer Connection (Yes/No); if yes, need to include a proposed sewer flow calculation per Maine's Subsurface Wastewater Disposal Rules, Chapter 241, Section 4 (Tables 4A & 4C)	Yes	Proposed to be serviced by Low Pressure Sewer		
Q	Public Storm Drain Connection (Yes/No)	No	No public storm drain connections proposed		
R	Limits of Disturbance in acres	Yes	Provided in Stormwater Report		
S	Pervious Land Cover square footage, existing and proposed	Yes	Provided in Stormwater Report		
T	Impervious Land Cover square footage (Pavement/Gravel), existing and proposed	Yes	Provided in Stormwater Report		
U	Building Roof square footage, existing and proposed	No	No buildings proposed, see Avesta Site Plan Application		
V	Assigned Planning Board Number	Yes	2024.21 As assigned during sketch plan application		
W	Estimated cut/fill earthwork volumes; if disturbing within Flood Zone, separate set of earthwork volumes required (site vs. within flood zone)	Yes	Reviewing an overall comparison of existing conditions and proposed conditions, we find that the project yields approximately 1370 cy of cut and 4520 cy of fill, or a net of 3150 cy of fill; not accounting for subbase materials or structual excavation for structures		
3	EXISTING CONDITIONS PLAN				
A	Horizontal & Vertical Datums annotated (NAD83 & NAVD88)	Yes			
B	Survey Benchmark Locations (with XYZ Coordinates annotated)	Yes	Plans have been updated to include benchmark information		
C	Property & Right-of-Way Lines	Yes			
D	Boundary line information (bearings, distances, etc.)	Yes			
E	Property pin and monumentation locations	Yes			
F	Existing easements with proper ownership identified	Yes			
G	Road Names & Individual Lot Labels (Map, Lot, Owner, Acreage)	Yes			
H	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
I	100-year Flood Zone Limits & Elevation	Yes			
J	USDA-NRCS Soil Boundaries and Labels	Yes			
K	Existing contours with adequate contour labelling; minimum 1' contour interval	Yes			
L	Existing building FFEs annotated	No	No existing buildings on proposed project area		
M	Spot elevations for existing building corners, door entrances, accessible parking/walkways, road centerlines, and bottom/top of curbs	No	No existing buildings on proposed project area		
N	Existing buildings & structures	No	No existing buildings on proposed project area		
O	Existing pavement areas & number of parking spaces	No	No existing buildings on proposed project area		
P	Existing ADA ramp geometry, detectable warning plates, and ADA parking spaces	No	No existing buildings on proposed project area		
Q	Existing site features (sidewalks, retaining walls, curbing, lightpoles, guide rails, dumpsters, fencing)	Yes	Abutting project under construction, completed conditions shown assumed as existing		

R	Existing signage and striping	Yes			
S	Existing underground utility locations (storm, sewer, force main, water, gas, elec, tele)	Yes			
T	Existing above-ground utility locations (manholes, catch basins, utility poles, hydrants, transformers, riprap)	Yes			
U	Rim, invert in, invert out, pipe size, cardinal direction (N, E, S, W) information for any existing utility infrastructure being tied into (upstream/downstream/outfalls)	Yes			
V	Existing tree lines, street trees, free-standing trees (12" or larger diameter at breast height), and vegetation	Yes			
W	Location of any borings, drinking wells, and monitoring wells	No	No borings conducted for the subdivision project		
4	SITE DEMOLITION & EROSION CONTROL (E&SC) PLAN				
A	Limits-of-disturbance outlined and acreage annotated	Yes			
B	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
C	100-year Flood Zone Limits	Yes			
D	Callout existing site features to be demolished/removed/replaced	Yes			
E	Callout existing utilities to be demolished/removed/abandoned-in-place	Yes			
F	Hatch existing buildings and pavement to be removed	Yes			
G	Construction Entrance location(s)	Yes			
H	Perimeter E&SC control location(s) (i.e. silt fence, erosion berm mix)	Yes			
I	Stockpile and staging area(s) identified (with proper perimeter control)	Yes			
J	Inlet protection location(s)	Yes			
K	Note requiring contractor to implement dust control measures throughout construction	Yes			
L	Note requiring contractor to pave utility trenches within right-of-way within 3 days of excavation or prior to any rain event	Yes			
M	If groundwater expected, show dewatering/silt bag location(s); show temporary pumping routing				
N	If large development is proposed with an extensive underground stormwater conveyance network, show sediment trap/basin location(s) needed for constructability/phasing; provide sizing calculations				
5	SITE PLAN/SUBDIVISION PLAN				
A	Partial Site Plans needed for any viewport scale greater than 1"=20'	No	1" = 30' scale plans appropriate for project detail		
B	Existing property and right-of-way lines	Yes			
C	Proposed subdivision lot lines and labels	Yes			
D	Required Zoning Setbacks shown with dimensions and annotation	Yes			
E	Bulk requirement summary table (zoning/parking calculations)	Yes			
F	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
G	100-year Flood Zone Limits	Yes			
H	Proposed building outlines, door entrances and loading docks	Yes	See Avesta Site Plans		
I	Proposed building labels	Yes			
J	Proposed road extents; provide clear annotation if roads will be public or private	Yes			
K	Proposed parking and accessible parking locations; annotate parking space counts	Yes			
L	Proposed signage, parking striping, and traffic striping	Yes			
M	Detailed ADA ramp geometry, detectable warning surfaces, and ADA parking striping/signage; existing & proposed	Yes			
N	Proposed site features (i.e. curbing, walls, fencing, guiderail, fire hydrant, transformers, light pole locations)	Yes			
O	Separate hatching for buildings, sidewalks, pavement, landscaping	Yes			
P	Proposed landscaping; detailed landscaping design should be on separate plans	No	Not Applicable		
Q	Designated snow storage areas	Yes			
R	Proposed dumpster locations and trash removal access	No	Not Applicable		
S	Linear dimensions of all drive aisles, sidewalk widths, parking spaces, loading docks	No	Not Applicable		
T	Radial dimensions for all curbs, landscaped islands, sidewalks	Yes			
U	Road centerline stationing shown, labelled every 0+50' with curve data	Yes			
V	If Private Road is proposed, final recorded plans must clearly note that proposed private roads will not be submitted in the future for public acceptance	No	Not Applicable		
W	If Private Road is proposed, final recorded plans must clearly note that the City is not responsible for any maintenance, repair, plowing, or trash removal of proposed private roads	No	Not Applicable		
X	Planning Board signature block for final recording	Yes			
6	GRADING PLAN				
A	Partial Grading Plans needed for any viewport greater than 1"=20'	No	1" = 30' scale plans appropriate for project detail		
B	Limits-of-disturbance outlined and acreage annotated	Yes			
C	Proposed Building Labels with Individual Finished Floor Elevations (FFE)s	No	Not Applicable		
D	Existing contours with adequate contour labelling, screened; minimum 1' contour interval	Yes			
E	Proposed contours with adequate contour labelling; minimum 1' contour interval	Yes			
F	Detailed grading for all ditches, swales, outfalls, and riprap	Yes			
G	All proposed contours tie-into existing contours at limits-of-disturbance outline	Yes			
H	Existing spot elevations for all asphalt and curb tie-in locations	Yes			
I	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
J	100-year Flood Zone Limits	Yes			
K	Proposed spot elevations for all important roadway geometric points and/or on a 50' maximum interval: low/high points, PC/PT, road centerline, edge-of-asphalt	Yes			
L	Proposed spot elevations for all curblines (bottom/top-of-curb) and sidewalks	Yes			
M	Proposed spot elevations for all parking and drive aisle geometry points	Yes			
N	Proposed spot elevations for all building corners and door-entry locations	No	Not Applicable		

O	Proposed retaining wall/loading dock elevations (bottom/top of wall)	No	Not Applicable		
P	Proposed spot elevations for all ADA ramp/landing/parking stall geometry points	No	Not Applicable		
Q	Proposed % slope arrows for all ADA parking spaces and sidewalks	No	Not Applicable		
R	Proposed longitudinal % slope arrows for drainage ditch centerlines	Yes			
S	Proposed % slope arrows for roads, parking areas, and landscape tie-in areas	Yes			
T	Estimated cut/fill earthwork volumes; if disturbing within Flood Zone, separate set of earthwork volumes required (site vs. within flood zone)	Yes	Reviewing an overall comparison of existing conditions and proposed conditions, we find that the project yields approximately 1370 cy of cut and 4520 cy of fill, or a net of 3150 cy of fill; not accounting for subbase materials or structural excavation for structures		
7	ROAD PROFILES (if public/private road proposed)				
A	Existing surface; dashed and screened	Yes			
B	Proposed surface; continuous and bold	Yes			
C	Corresponding centerline stationing and curve data annotation	Yes			
D	Road cross-section including proposed surface cross slopes; include multiple sections for various road cross slope conditions proposed (crowned, superelevated)	Yes			
E	Horizontal and vertical scale bars	Yes			
F	Clear annotation if proposed road will be public or private	Yes			
G	If Private Road is proposed, plans must clearly note that proposed private roads will not be submitted in the future for public acceptance	No	Not Applicable		
H	If Private Road is proposed, plans must clearly note that the City is not responsible for any maintenance, repair, plowing, or trash removal of proposed private roads	No	Not Applicable		
8	UTILITY PLAN				
A	Existing underground utility locations; screened (storm, sewer, force main, water, gas, electric, telecom)	Yes			
B	Existing above-ground utility locations; screened (manholes, catch basins, utility poles, hydrants, riprap)	Yes			
C	Rim, invert in, invert out, pipe size, cardinal direction (N, E, S, W) information for any existing utility infrastructure being tied into (upstream/downstream/outfalls)	Yes			
D	Proposed underground utility locations; bold (storm, sewer, force main, water, gas, electric, telecom, lighting)	Yes			
E	Proposed above-ground utility locations; bold (manholes, catch basins, utility poles, hydrants, transformers, riprap)	Yes			
F	Proposed storm culverts, outfalls, and riprap locations and sizes	Yes			
G	Storm/sewer structure labels must include: rim, inverts in, inverts out, pipe sizes, cardinal directions (N, E, S, W)	Yes			
H	Storm/sewer pipe labels must include: linear footage, pipe size, material, slope	Yes			
I	Flow directional arrows for storm & sewer pipes	Yes			
J	Proposed & existing site features shown that could conflict with proposed utilities (trees, signs, lightpoles, bollards, foundations, guiderails)	Yes			
K	All storm drains must be sized to convey the 25-year storm	Yes			
L	Sewer force main sizes and invert elevations	Yes			
M	Sewer pump station locations, model, rim, inverts, pipe sizes, cardinal directions (N,E,S,W)	Yes			
N	Grease trap & oil-water separator locations, sizes, elevations	No	Not Applicable		
O	Water, gas, electric, and telecom sizes labelled	Yes			
9	UTILITY PROFILES	No	All Gravity information shown on plans		
A	Utility profiles for <u>all</u> gravity storm drains and sewer pipes, including all laterals, catch basins, culverts, and outfalls; profiles preferred to be aligned on the pipe centerline (not superimposed on the road centerline)				
B	Existing surface; dashed and screened				
C	Proposed surface; continuous and bold				
D	Storm/sewer structure labels must include: rim, inverts in, inverts out, pipe sizes, cardinal directions (N, E, S, W)				
E	Storm/sewer pipe labels must include: linear footage, pipe size, material, slope				
F	Existing and proposed gravity pipe crossings shown; sizes labelled and depths/clearance annotated				
G	Existing and proposed electric/water/telecom/gas crossings shown at approximate depths; sizes labelled and depths/clearance annotated				
H	Known ledge or groundwater elevations				
I	For all storm drains, 25-year HGL must be shown on profiles with starting tailwater condition identified				
J	For storm outfalls, include riprap sizing and grading extents				
K	Horizontal and vertical scale bars				
10	DETAILS				
A	Road section detail, including pavement & gravel depths	Yes			
B	Sidewalk, paver, crosswalk, and any other pavement section details	Yes			
C	Pavement sawcut detail	Yes			
D	Utility trench/backfill detail	Yes			
E	All site feature details; curbing, retaining walls, fencing, guiderails, dumpsters, etc.	Yes			
F	Signage, striping, and ADA details	Yes			
G	E&S notes and details; only show applicable/proposed measures	Yes			
H	Utility structure details (manholes, cleanouts, fittings, handholes, transformer pads, hydrants)	Yes			
I	Storm outfall & riprap details	Yes			

J	Drainage ditch cross section identifying minimum depth, minimum bed width, and maximum side slopes	Yes			
K	Pump station, grease trap, and oil-water separator details	Yes			
L	Conduit section details	Yes			
M	Miscellaneous details (as needed)	Yes			
11	LANDSCAPING, LIGHTING & PHOTOMETRIC PLANS				
A	As required by ordinance; at a minimum: locations, counts, and species/models must be identified	Yes			
B	Landscaping & lighting details	Yes			
12	DOCUMENTS/REPORTS/CALCULATIONS				
A	On initial preliminary submittal applications, applicant must submit a development review and inspection fee. Applicant to coordinate fee amount with City Planner prior to submittal. This fee will be drawn against to cover the following type of services throughout the project life cycle (and may require replenishing): i. 3rd Party City Peer-Review ii. Site Inspections during the permitting process iii. Erosion & Sediment Control Inspections during construction iv. Right-of-Way Inspections during construction v. Site Punchlist/As-Built Inspections post-construction	Yes	Per Sketch plan application, Sketch Plan Application fees of \$6,835 and Preliminary Application fees of \$1,515 have been paid previously, and the Final Application fees of \$825 have been submitted with this application		
B	Predevelopment & Post-development Drainage Area Maps, including: i. Subdrainage areas delineated and labeled ii. Points of Interest/Analysis shown and labeled iii. Hatching for different land cover areas (impervious, pervious, gravel) iv. Time of concentration (Tc) paths & durations v. Four City-standardized stormwater summary tables	Yes			
C	An approved 'Sewer Ability-to-Serve Letter' from the Engineering Department: i. Applicant to submit proposed sewer flow calculations per Maine's Subsurface Wastewater Disposal Rules, Chapter 241, Section 4 (Tables 4A & 4C)	Yes	Provided in preliminary application		
D	A Performance Guarantee Cost Estimate utilizing Planning's template	Yes	Included as Attachment 5		
E	25-year hydraulic calculations for all storm conveyance piping (rational method), including starting tailwater conditions/documentation	Yes	See Stormwater Report		
F	If any SWM water quality BMP or detention facility is proposed, hydrologic model exports/hydrographs must be submitted for the for the 2, 10, 25, & 100-year storm frequencies	Yes	See Stormwater Report		
G	Sizing calculations for any SWM water quality BMP or detention facility	Yes	See Stormwater Report		
H	A stormwater maintenance manual for any proposed SWM water quality BMP or detention facility, including: i. Annual maintenance requirements ii. Annual inspection requirements by a licensed PE; noting that all inspection reports/logs need to be submitted to the Engineering Department by March 1st each following year, identifying what on-going maintenance has occurred and what remedial repairs are needed iii. Signed Property Owner Agreement: including the current property owner's contact information and signature; it must be noted that all stormwater BMP maintenance requirements are linked to the property for perpetuity and transfer to any new ownership	Yes	See Stormwater Report		
I	Salt Management Plan	Yes			
J	Sewer pump station sizing calculations	Yes			
K	Sewer pump station maintenance plan	Yes			
L	Grease trap sizing calculations	No	Not Applicable		
M	Homeowner Association (HOA) agreement for any private road serving two (2) lots or more	Yes	Provided in preliminary application		
N	Summary list & copy of any required DOT/DEP/USACE permits & approvals	Yes	Project has applied for Maine DEP Stormwater Law Permit, copies provided to City		

BARRA ROAD SUBDIVISION

BARRA ROAD
BIDDEFORD, MAINE

FOR
INDIAN CLIFF DEVELOPMENT CORP.
260 MAIN STREET
P.O. BOX 444
BIDDEFORD, MAINE

PLAN INDEX

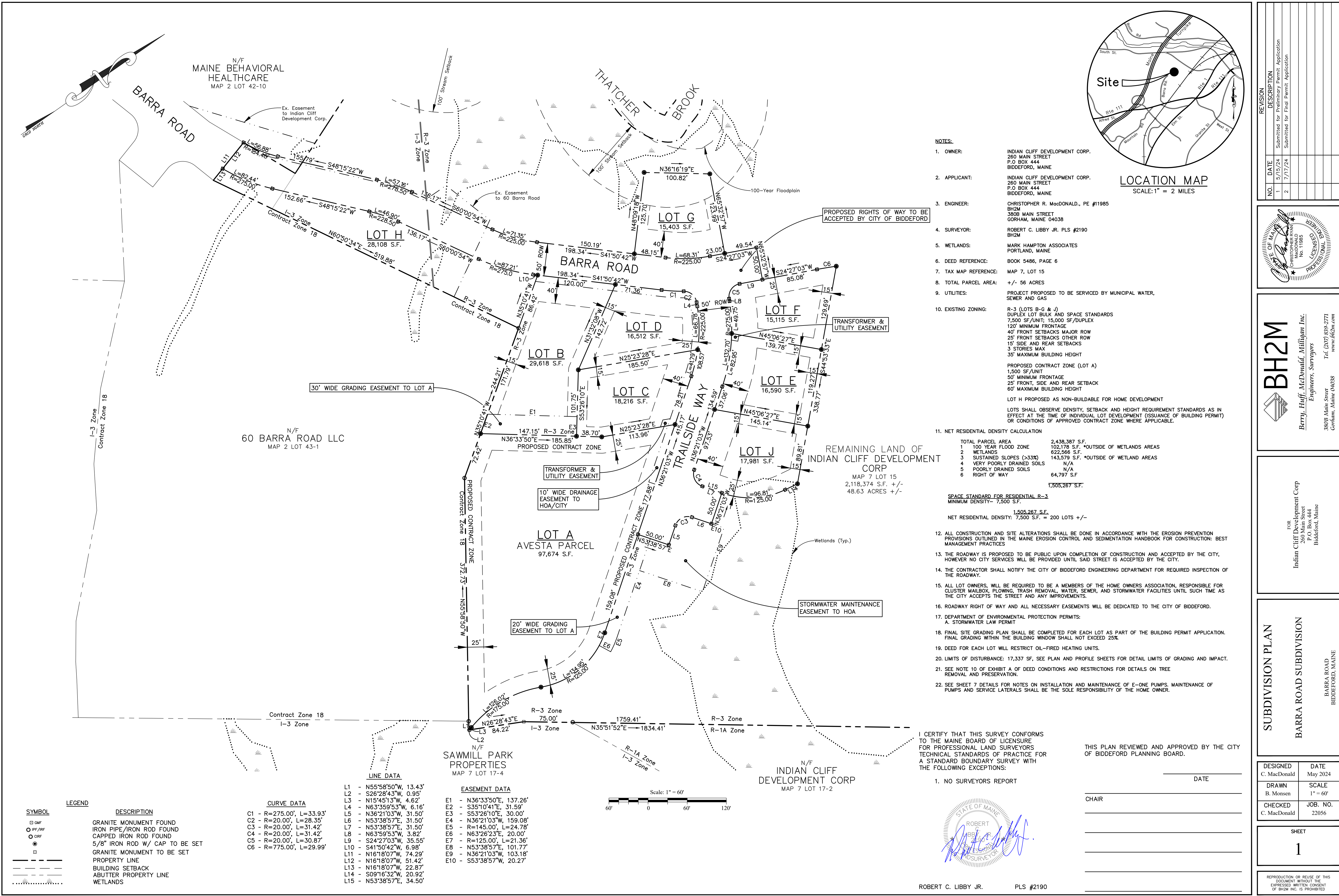
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|----|---|
| 1 | SUBDIVISION PLAN |
| 2 | STANDARD BOUNDARY SURVEY PLAN |
| 3 | EXISTING CONDITIONS PLAN |
| 4 | PLAN & PROFILE - BARRA ROAD (STA. 203+00 to 209+00) |
| 5 | PLAN & PROFILE - TRAILSIDE WAY (STA. 300+00 to 304+12.93) |
| 6 | EROSION CONTROL DETAILS |
| 7 | UTILITY DETAILS |
| 8 | DETAILS A |
| 9 | GRASSED UNDERDRAINED SOIL FILTER 2 DETAILS |
| 10 | GRASSED UNDEDRRAINED SOIL FILTER 3 DETAILS |
| A | PRE DEVELOPMENT PLAN |
| B | POST DEVELOPMENT PLAN |

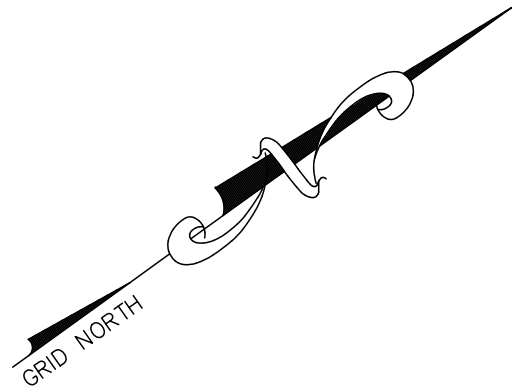
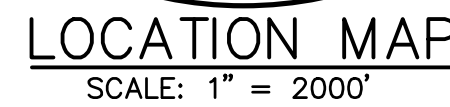


Berry, Huff, McDonald, Milligan Inc.
Engineers, Surveyors

380B Main Street
Gorham, Maine 04038

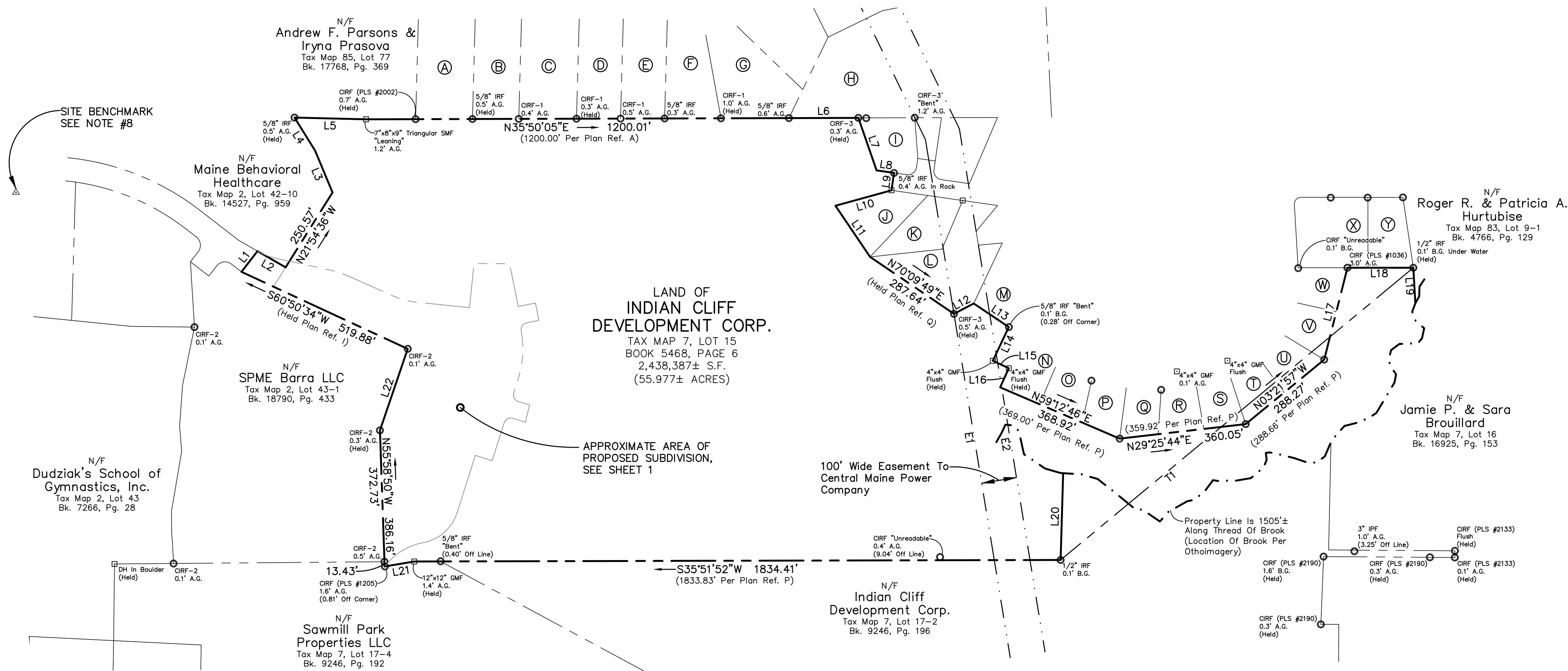
Tel. (207) 839-2771
Fax (207) 839-8250





<u>ABUTTER LIST</u>			
<u>SYMBOL</u>	<u>OWNER</u>	<u>TAX MAP</u>	<u>LOT</u> <u>BOOK/PAGE</u>
(A)	DONALD J. & CYNTHIA J. COTE	85	78 5865/1
(B)	JAMES A. & MARY ANN GOLDMAN	85	79 18831/647
(C)	MICHAEL B. & KATHLEEN E. WILLETT	85	80 6919/67
(D)	WENDY ANN & RICHARD ST. PIERRE	85	81 19131/665
(E)	LARRY L. & DEBORAH Y. LAVERIERE	85	82 6620/272
(F)	MARC P. & DENISE M. LESSARD	85	83 7969/288
(G)	RICKY P. DOYON	85	84 16361/797
(H)	JOAN M. COTE	85	94-1 14698/746
(J)	KENNETH B. & JANICE M. NADEAU	83	52 7832/335
(K)	BENJAMIN E. JEROME & MARY O'NEIL	83	53 17734/565
(L)	PETER J. & DEBORAH K. DUMOULIN	83	54 8357/269
(M)	ALEXANDER & SUSAN D. MILLETT	83	55 15083/144
(N)	BRIAN R. & LINDA L. LAVERIERE	83	47 5902/173
(O)	THOMAS J. & TINA F. CALLAHAN	83	22 4679/154
(P)	CONSOLEE MUKAMULIGO	83	21 18805/383
(Q)	NATHAN R. CADORETTE & SHELBI P. GUIMOND	83	20 17626/398
(R)	JANET & KATELYN M. GENDRON	83	19 19124/290
(S)	DONALD R. GIRARD & ATHENA M. PAPPACONSTANTINE	83	18 11664/145
(T)	MARIA Y. GILLEY	83	17 17456/494
(U)	WILLIAM R. CLINE	83	16 8941/310
(V)	RICHARD M. WENTWORTH & CONSTANCE J. SAYER	83	15 4520/23
(W)	MARY L. MAYO	83	14 16360/870
(X)	KEVIN EARL SR. & CAROL JEAN DURAN	83	13 4661/291
(Y)	ALBERT L. & JOAN M. NOLETTE	83	11 3861/165
(Z)	BANG H. & THUY DUONG NGOC NGUYEN	83	10 15757/564

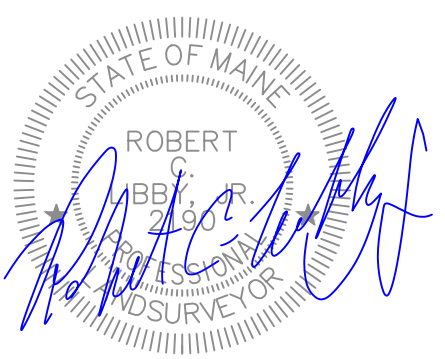
Q. "FINAL PLAN-AMENDED, VILLAGE WOODS", DATED DECEMBER 1993, FOR INDIAN CLIFF DEVELOPMENT CORP., BY BH2M AND RECORDED IN THE YORK COUNTY REGISTRY OF DEEDS IN PLAN BOOK 222, PAGE 27.



L2	N16°18'07"W	74.29°	(Held Plan Ref. I)
L1	N65°55'22"E	92.15°	(Held Plan Ref. I)
L3	N76°36'23"N	128.33°	(Held Plan Ref. P)
L4	N85°53'07"W	110.71°	(110.93° Plan Ref. P)
L5	N87°12'45"E	203.39°	(203.01° Plan Ref. P)
L6	N33°00'05"E	103.00°	(102.00° Plan Ref. M)
L7	S73°00'50"E	157.56°	(157.63° Plan Ref. P)
L8	N44°08'23"E	50.00°	(Held Plan Ref. Q)
L9	S45°51'37"E	50.00°	(Held Plan Ref. Q)
L10	S20°38'23"W	165.00°	(Held Plan Ref. Q)
L11	S88°07'23"E	175.22°	(Held Plan Ref. Q)
L12	N08°19'42"E	63.25°	(Held Plan Ref. K)
L13	N69°49'42"E	120.00°	(Held Plan Ref. K)
L14	S28°38'36"E	105.78°	(105.62° Plan Ref. K)
L15	N61°14'04"E	49.99°	(50.00° Plan Ref. K)
L16	S24°49'26"E	59.40°	(59.04° Plan Ref. P)
L17	N36°00'52"E	188.98°	(265.00° Plan Ref. P)
L18	N36°00'26"E	188.99°	(265.00° Plan Ref. P)
L19	S55°15'29"E	101°	To Thread of Brook
L20	S52°19'51"E	246°	To Thread of Brook
L21	S26°28'43"W	85.17°	(84.65° Plan Ref. P)
L22	N35°10'41"E	244.21°	

I CERTIFY THAT THIS SURVEY CONFORMS
TO THE MAINE BOARD OF LICENSURE
FOR PROFESSIONAL LAND SURVEYORS
TECHNICAL STANDARDS OF PRACTICE FOR
A STANDARD BOUNDARY SURVEY WITH
THE FOLLOWING EXCEPTIONS:

1. NO SURVEYORS REPORT



ROBERT C. LIBBY JR. PLS #2190

[illegible]

 **BH2M**

Berry, Huff, McDonald, Milligan Inc.
Engineers, Surveyors

380B Main Street
Gortland, Maine 04038
Tel. (207) 839-2771
www.bh2m.com

FOR
Indian Cliff Development Corp
260 Main Street
P.O. Box 444
Biddeford, Maine

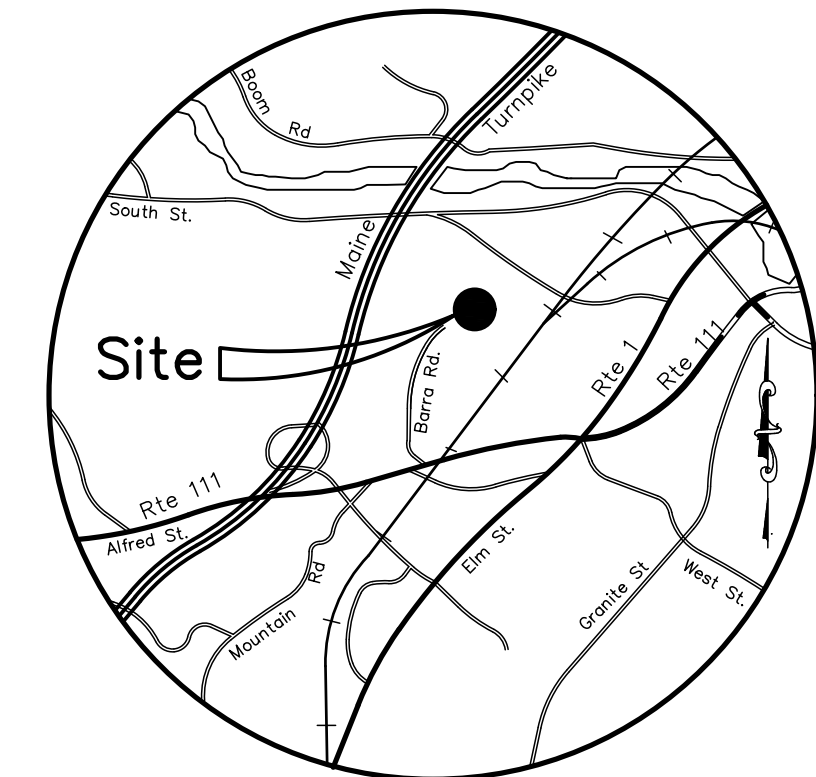
STANDARD BOUNDARY
SURVEY PLAN

BARRA ROAD SUBDIVISION

BARRA ROAD
BIDDEFORD, MAINE

DESIGNED T. Taggett	DATE May 2024
DRAWN Dept.	SCALE 1" = 200'
CHECKED R. Libby Jr.	JOB. NO. 22056

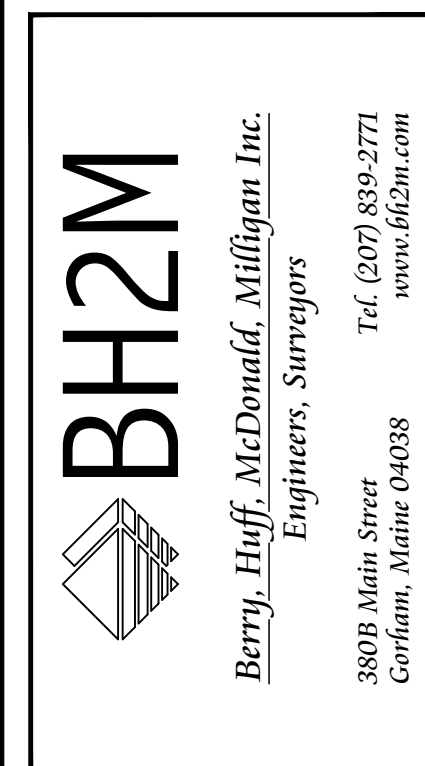
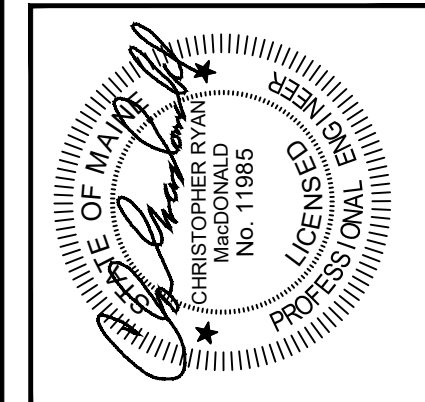
SHEET
2
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LOCATION MAP
SCALE: 1" = 2 MILES

- NOTES:
1. OWNER: INDIAN CLIFF DEVELOPMENT CORP.
260 MAIN STREET
P.O BOX 444
BIDDEFORD, MAINE
 2. SURVEYOR: ROBERT C. LIBBY JR. PLS #2190
BH2M
380B MAIN STREET
GORHAM, MAINE
 3. WETLANDS: MARK HAMPTON ASSOCIATES
PORTLAND, MAINE
 4. DEED REFERENCE: BOOK 5486, PAGE 6
 5. TAX MAP REFERENCE: MAP 7, LOT 15
 6. TOTAL PARCEL AREA: +/- 56 ACRES
 7. THE SURVEYED PARCEL IS LOCATED WITHIN ZONE A (AREAS OF 100 YEAR FLOODING) AS SHOWN ON THE FLOOD INSURANCE RATE MAP FOR THE CITY OF BIDDEFORD, MAINE, COMMUNITY PANEL NO. 230145 0003B, DATED MAY 15, 1984.
 8. HORIZONTAL DATUM: NAD 83 MAINE WEST
 9. VERTICAL DATUM: NAVD 88
 10. BENCHMARK: MULTIPLE SHOWN ON PLAN
 11. EXISTING TOPOGRAPHY BASED ON GROUND TOPOGRAPHY BY BH2M PERFORMED WINTER OF 2024, LIDAR DERIVED FROM NOAA DIGITAL COAST DATA 2020 USGS LIDAR: SOUTH COASTAL MAINE (QL2), AND ASSUMED CONDITIONS BASED ON GRADING CURRENTLY UNDER CONSTRUCTION BY 60 BARRA ROAD TO BE COMPLETED SUMMER OF 2024. SEE BOUNDARIES AS NOTED.
 12. EXISTING PUBLIC AND PRIVATE UTILITY AND UNDERGROUND LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE, AND ALL UTILITIES AND PIPES ARE NOT NECESSARILY SHOWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING IN FIELD THE LOCATIONS OF UTILITIES SHOWN, AND FOR INVESTIGATING AND IDENTIFYING THE EXISTENCE AND LOCATIONS OF ANY ADDITIONAL PUBLIC AND PRIVATE UTILITIES NOT SHOWN ON THE PLANS, BEFORE COMMENCING ANY EXCAVATIONS, AND SHALL BE RESPONSIBLE FOR REPAIRING ALL UTILITIES AND PIPES, BOTH PUBLIC AND PRIVATE, WHETHER SHOWN ON PLANS OR NOT, THAT ARE DISTURBED DURING CONSTRUCTION. ALL COSTS INCURRED IN INVESTIGATING AND REPAIRING SAID UTILITIES SHALL BE BORNE BY THE CONTRACTOR, AND SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE WORK PAID FOR UNDER THE APPLICABLE LUMP SUM AND UNIT PRICES IN THE CONTRACT. UTILITIES INCLUDE BUT ARE NOT LIMITED TO ELECTRIC, TELEPHONE, NATURAL GAS, WATER, SEWER AND STORM DRAINAGE. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING DIG SAFE.
 13. PLAN REFERENCES:
 - A. BOUNDARY SURVEY, INCLUDED AS SHEET 2 OF THIS PLANSET
 - B. BARRA ROAD APARTMENTS, A 250 UNIT APARTMENT PROJECT, 60 BARRA ROAD, BIDDEFORD MAINE, ISSUED FOR CONSTRUCTION PLANSET BY BH2M.

REVISION		DESCRIPTION
NO.	DATE	
1	5/15/24	Submitted for Preliminary Permit Application
2	7/17/24	Submitted for Final Permit Application



FOR
Indian Cliff Development Corp
260 Main Street
P.O. Box 444
Biddeford, Maine

EXISTING CONDITIONS
PLAN

BARRA ROAD SUBDIVISION

BARRA ROAD
BIDDEFORD, MAINE

DESIGNED C. MacDonald	DATE May 2024
DRAWN Dept.	SCALE 1" = 60'
CHECKED C. MacDonald	JOB. NO. 22056

SHEET
3

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SYMBOL

☐ GWF

☒ IPF/IRF

☐ CRF

☒ IRS

☐ IR

□ QJ

DESCRIPTION

GRANITE MONUMENT FOUND

IRON PIPE/IRON ROD FOUND

CAPPED IRON ROD FOUND

5/8" IRON ROD W/ CAP TO BE SET

GRANITE MONUMENT TO BE SET

UTILITY POLE

PROPERTY LINE

ABUTTER PROPERTY LINE

WETLANDS

WATER MAIN

FORCEMAIN

GAS MAIN

OVERHEAD UTILITIES

SOILS LEGEND

<u>SYMBOL</u>	<u>DESCRIPTION</u>
	SOIL BOUNDARY LINES

SOIL DESIGNATION

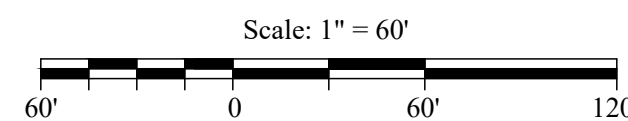
AdB(A)

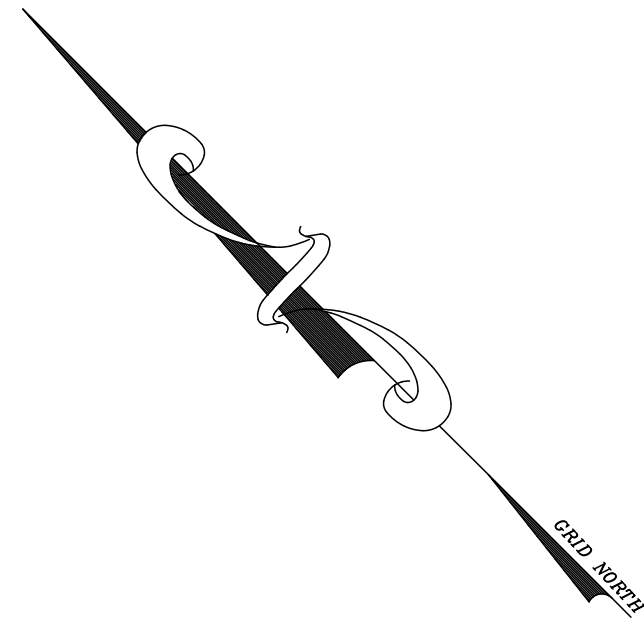
SLOPE DESIGNATION

HYDROLOGIC SOIL GROUP

HYDROLOGIC SOIL

<u>HYDROLOGIC SOIL GROUP</u>	
<u>SOIL</u>	<u>GROUP</u>
BUXTON (BuC)	C
LYMAN-ROCK (LyB)	D
LYMAN-ROCK (LyC)	D
SCANTIC (Sc)	D





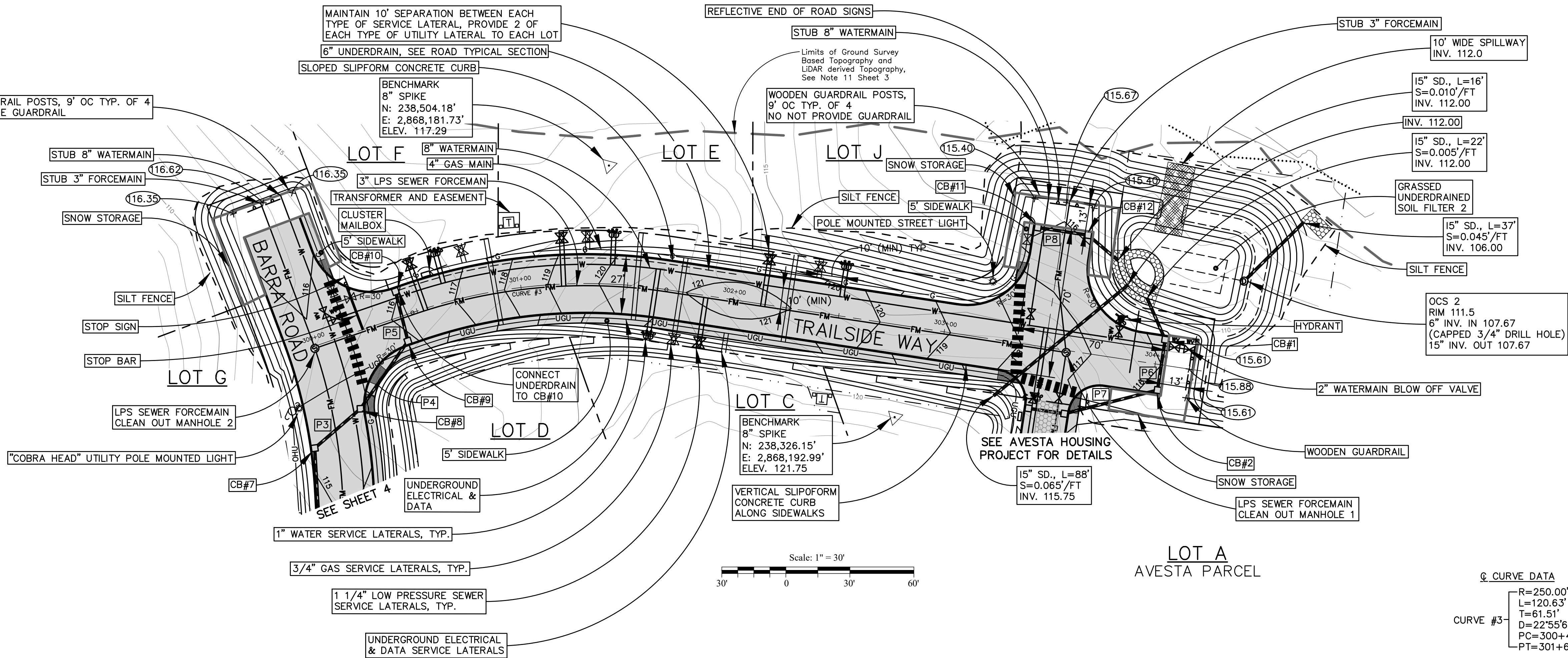
<u>SYMBOL</u>	<u>DESCRIPTION</u>
	GRANITE MONUMENT FOUND
	IRON PIPE/IRON ROD FOUND
	CAPPED IRON ROD FOUND
	5/8" IRON ROD W/ CAP TO BE SET
	GRANITE MONUMENT TO BE SET
	UTILITY POLE
	PROPERTY LINE
	BUILDING SETBACK
	ABUTTER PROPERTY LINE
	WETLANDS
	WATER MAIN
	FORCEMAIN
	GAS MAIN
	OVERHEAD UTILITIES
	GUARDRAIL FENCE

LEGEND

SYMBOL	DESCRIPTION
	GRANITE MONUMENT TO BE SET
	UTILITY POLE
	PROPERTY LINE
	BUILDING SETBACK
	ABUTTER PROPERTY LINE
	WETLANDS
	WATER MAIN
	FORCEMAIN
	GAS MAIN
	OVERHEAD UTILITIES
	GUARDRAIL FENCE

NOTES:

- CONTRACTOR TO IDENTIFY STOCKPILE AREAS AND APPROPRIATE EROSION AND SEDIMENTATION CONTROL PRIOR TO CONSTRUCTION.
- CONTRACTOR TO IMPLEMENT DUST CONTROL MEASURES THROUGHOUT CONSTRUCTION.
- CONTRACTOR TO PAVE UTILITY TRENCHES WITHIN ROW WITHIN 3 DAYS OF EXCAVATION OR PRIOR TO ANY RAIN EVENT.
- THERE SHALL BE NO SNOW STORAGE WITHIN THE GRASSED UNDERDRAINED SOIL FILTERS OR FOREBAYS AT ANY TIME.



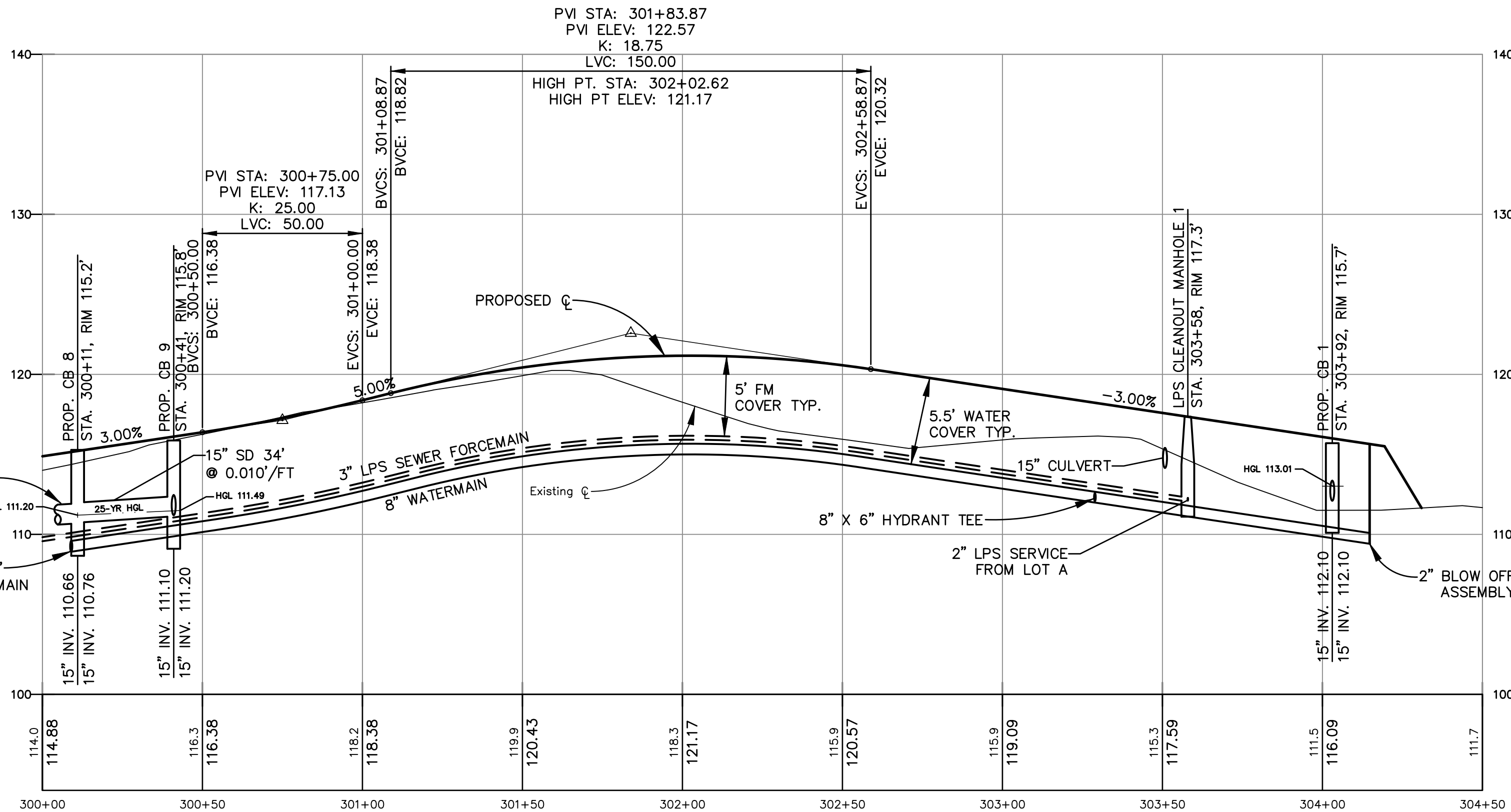
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L=120.63'
T=61.51'
D=22°55'6\"/>
PC=300+47.17
PT=301+68.34

STORMDRAIN PIPES

- P3 - 15\"/>

STORMDRAIN/SEWER STRUCTURES

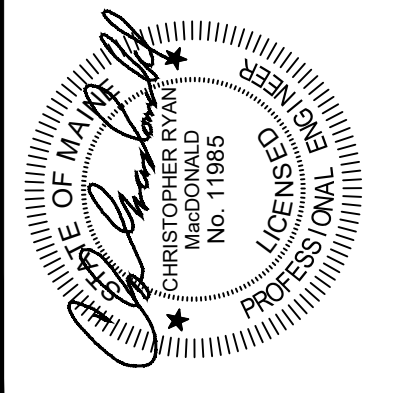
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15\"/>



TRALSIDE WAY

SCALE
VERTICAL: 1" = 6'
HORIZONTAL: 1" = 30'

NO.	DATE	REVISION	DESCRIPTION
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BH2M
Berry, Huff, MacDonald, Miligan Inc.
Engineers, Surveyors
380B Main Street
Concord, Maine 04038
Tel: (207) 839-2771
www.bh2m.com

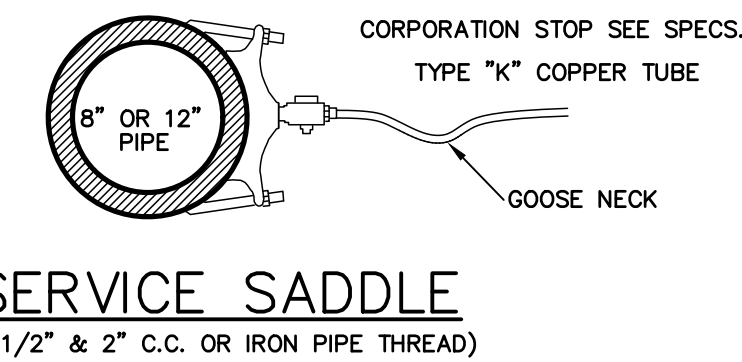
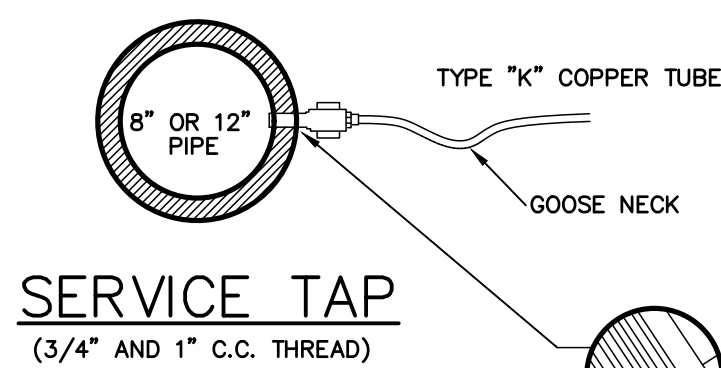
FOR
Indian Cliff Development Corp
P.O. Box 444
260 Main Street
Biddeford, Maine

PLAN & PROFILE
TRALSIDE WAY (STA. 300+00 TO 304+12.93)
BARRA ROAD SUBDIVISION
BARRA ROAD
BIDDEFORD, MAINE

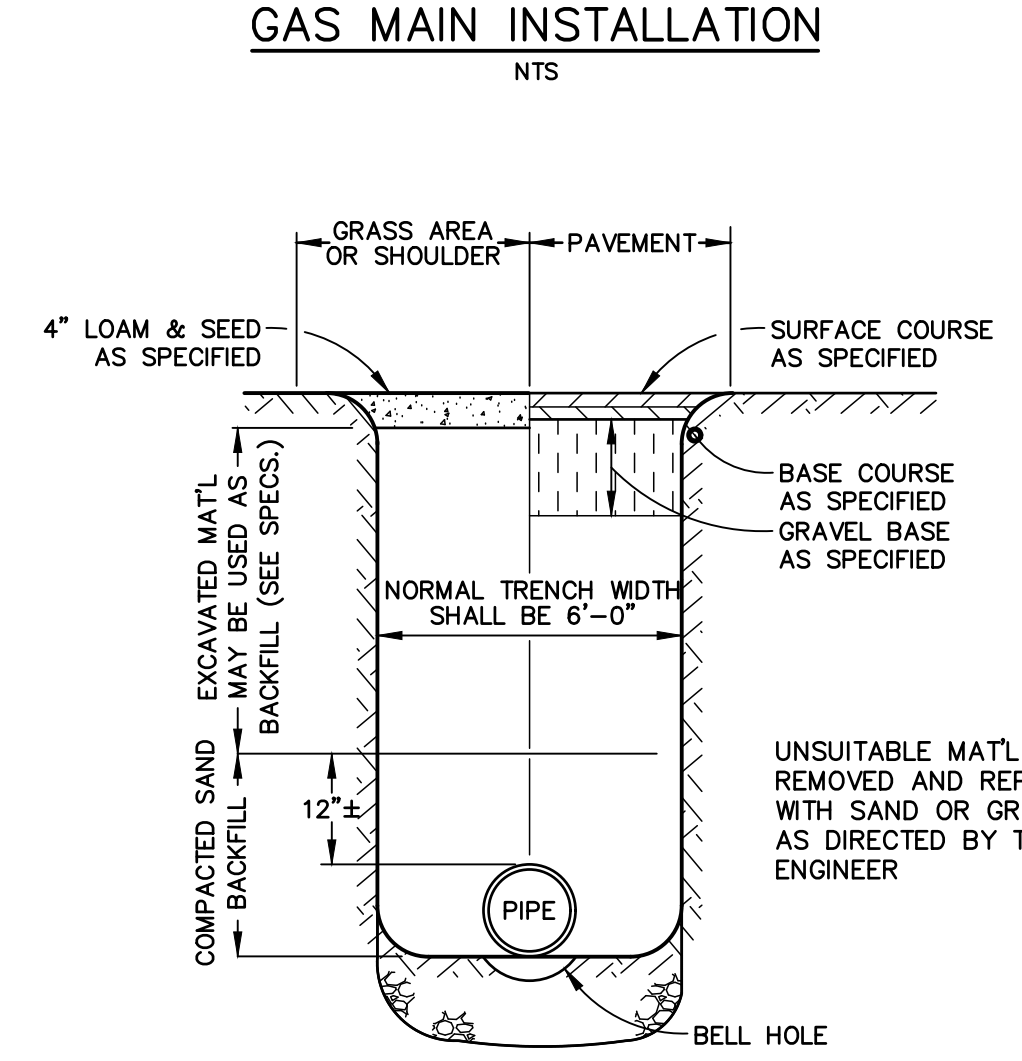
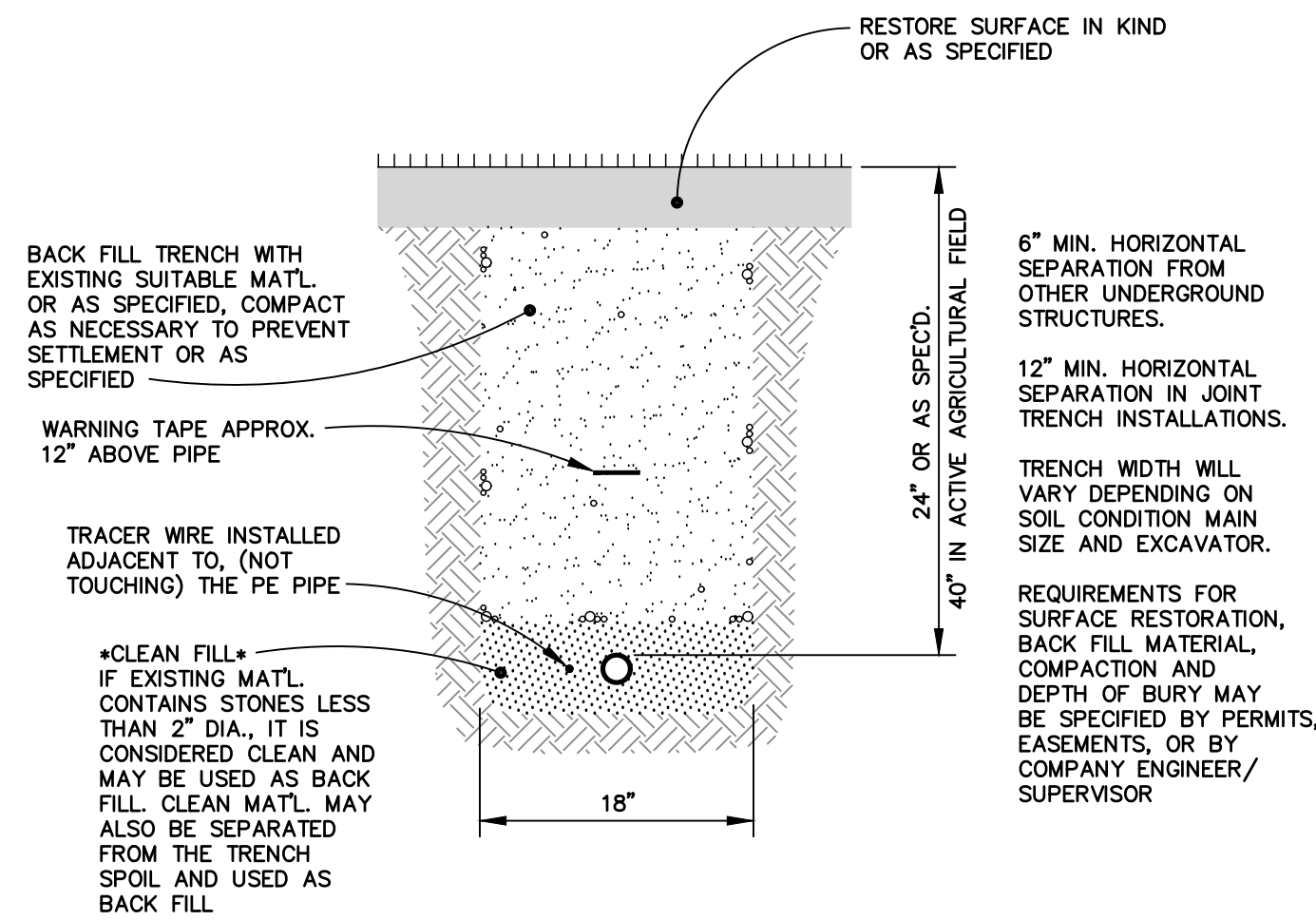
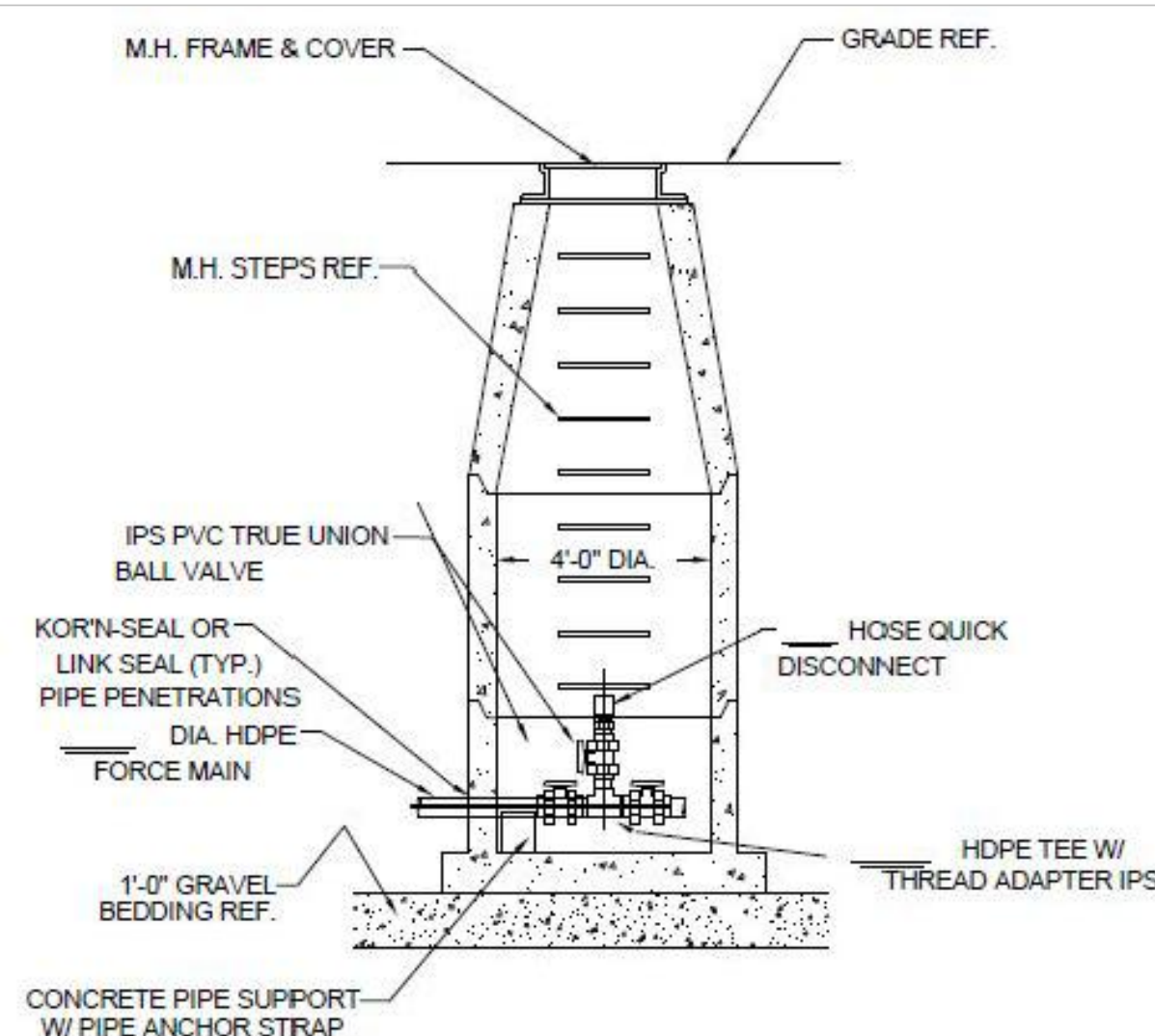
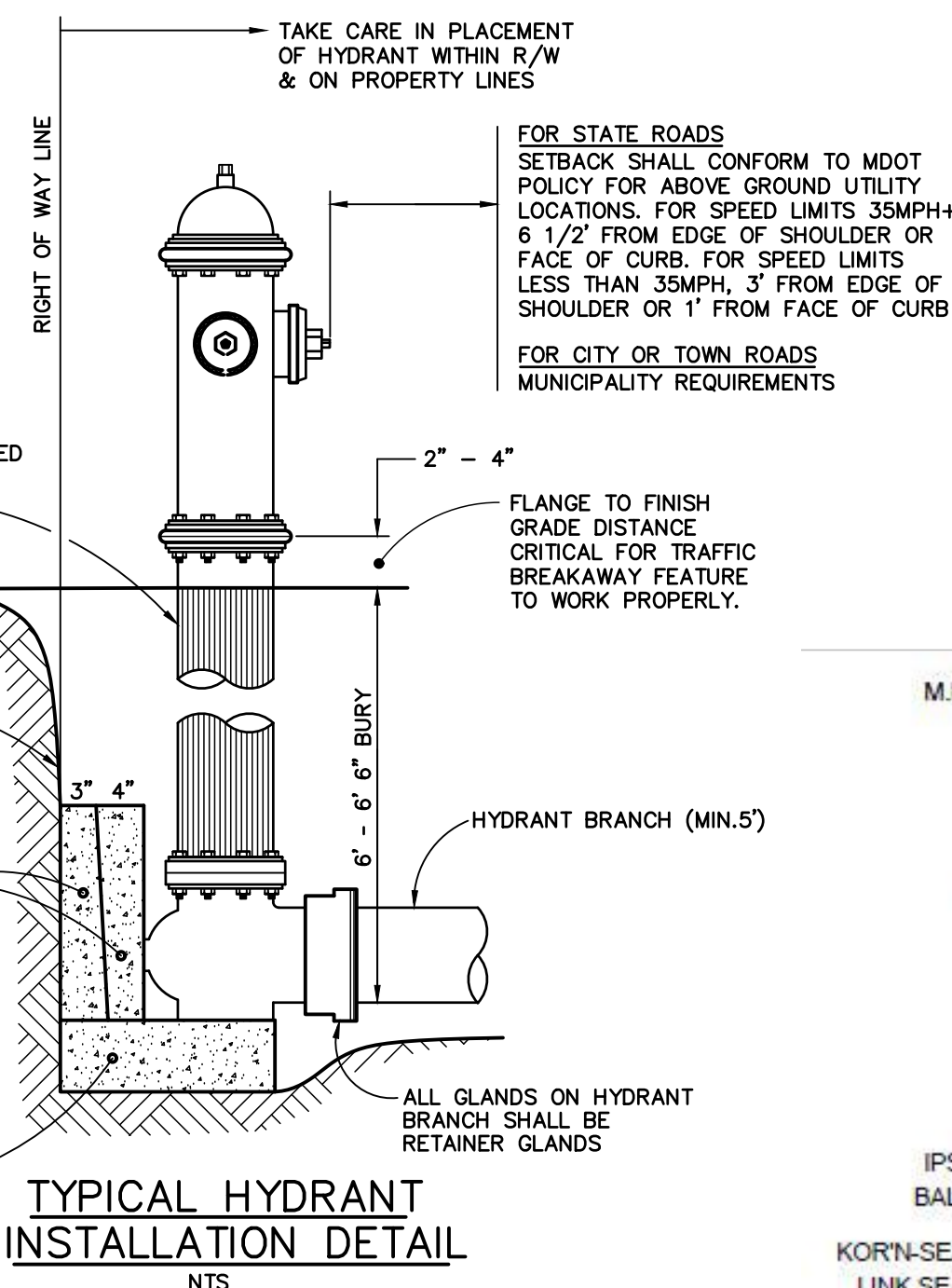
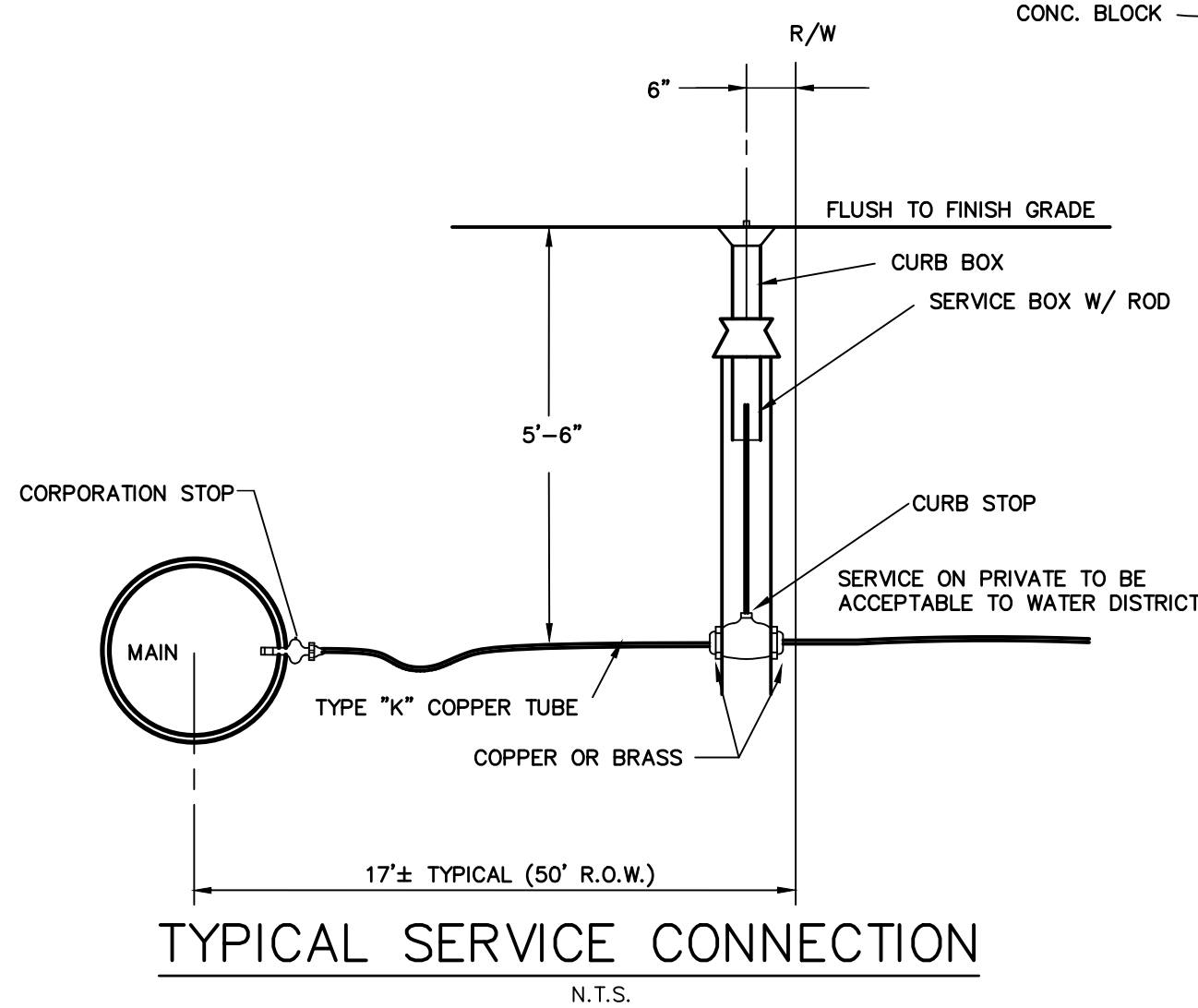
DESIGNED C. MacDonald	DATE May 2024
DRAWN Dept.	SCALE 1" = 30'
CHECKED C. MacDonald	JOB. NO. 22056

SHEET 5

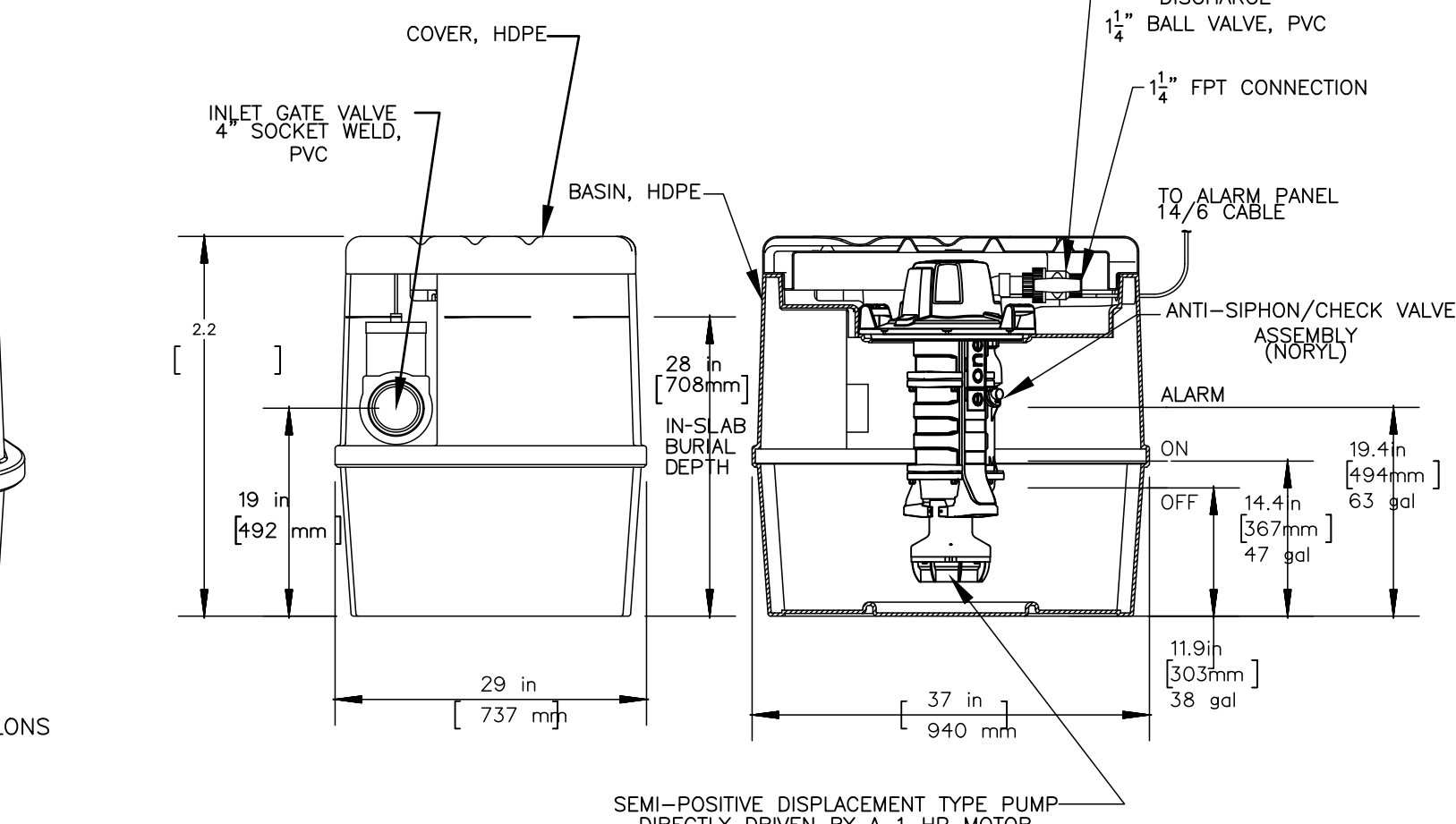
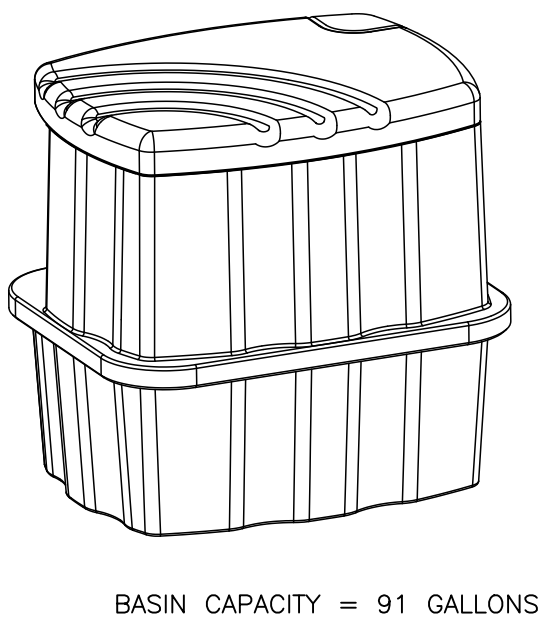
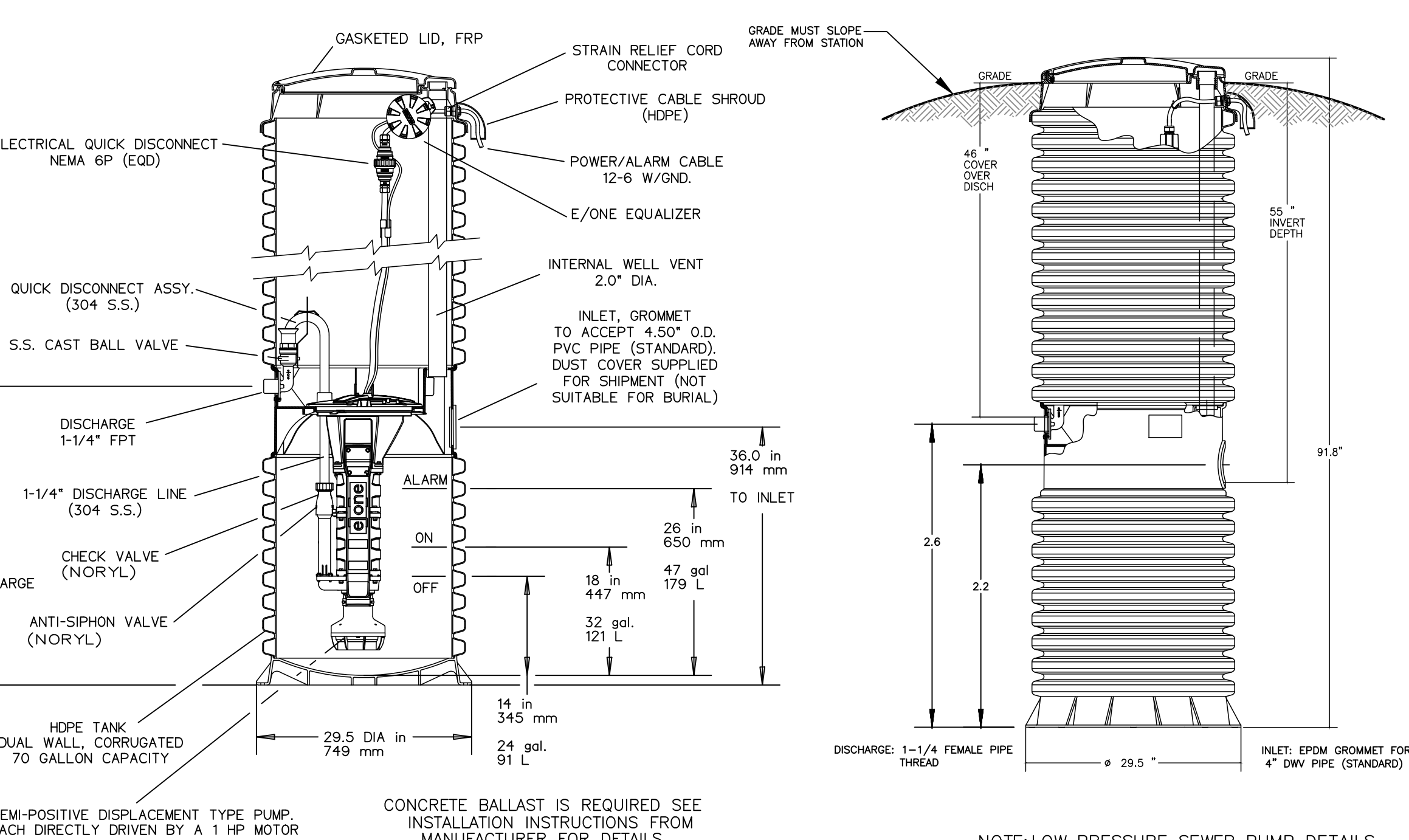
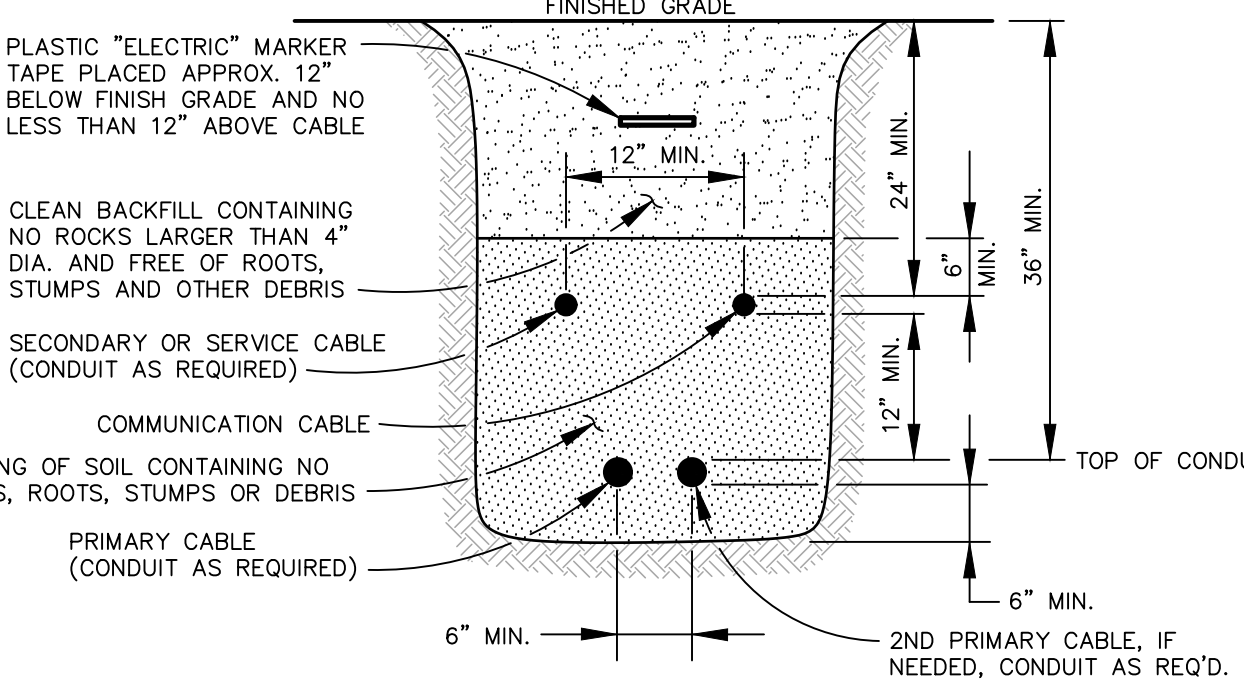
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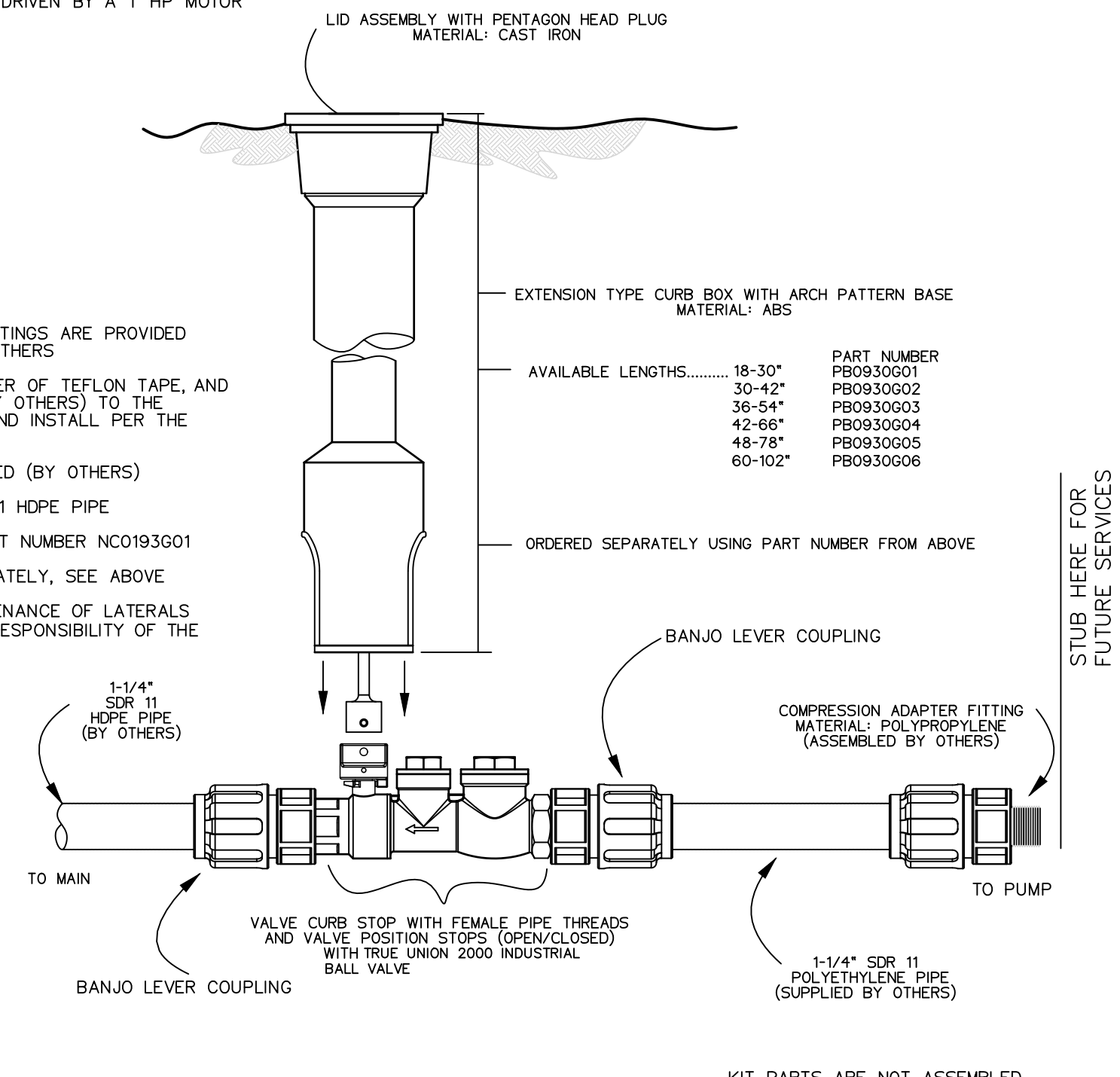
NOTE: SERVICE CONNECTIONS (DIRECT TAPS AND SERVICE CLAMPS) WILL BE INSTALLED SO THAT THE OUTLET IS AT AN ANGLE OF NOT MORE THAN 45° ABOVE THE HORIZONTAL. ALWAYS PUT A BEND OR "GOOSENECK" IN THE SERVICE LINE PRIOR TO CONNECTING TO PROVIDE FLEXIBILITY AND "GIVE" TO COUNTERACT THE EFFECTS OF A LOAD DUE TO SETTLEMENT OR EXPANSION AND/OR CONTRACTION (SEE DETAILS).



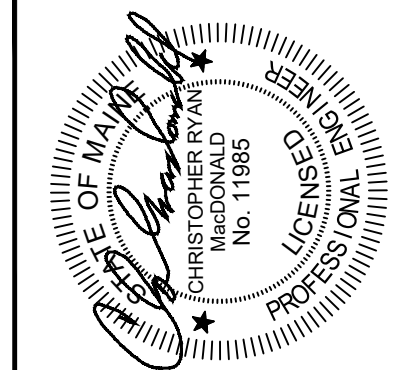
NOTES:
INSTALLATION SHOULD NOT ALLOW THE INTER-TWINING OF CABLES.
COMMUNICATION AND POWER CABLES SHALL HAVE NO LESS THAN 12" OF RADIAL SEPARATION.
CONDUITS FOR POWER AND COMMUNICATION CABLES SHALL BE SPECIFIED BY APPROPRIATE UTILITY COMPANIES.



NOTES:
1. SS CURB STOP/CHECK VALVE AND FITTINGS ARE PROVIDED SEPARATELY, TO BE ASSEMBLED BY OTHERS
2. TO ASSEMBLE, APPLY A DOUBLE LAYER OF TEFLON TAPE, AND A LAYER OF PIPE DOPE (SUPPLIED BY OTHERS) TO THE THREADS ON THE PLASTIC FITTINGS AND INSTALL PER THE MANUFACTURER'S INSTRUCTIONS
3. ASSEMBLY IS TO BE PRESSURE TESTED (BY OTHERS)
4. ASSEMBLY IS TO BE USED WITH SDR11 HDPE PIPE
5. TO ORDER SS LATERAL KIT, USE PART NUMBER NC0193G01
6. CURB BOX IS TO BE ORDERED SEPARATELY, SEE ABOVE
7. OWNERSHIP INSTALLATION AND MAINTENANCE OF LATERALS AND PUMPS SHALL BE THE SOLE RESPONSIBILITY OF THE HOMEOWNER.



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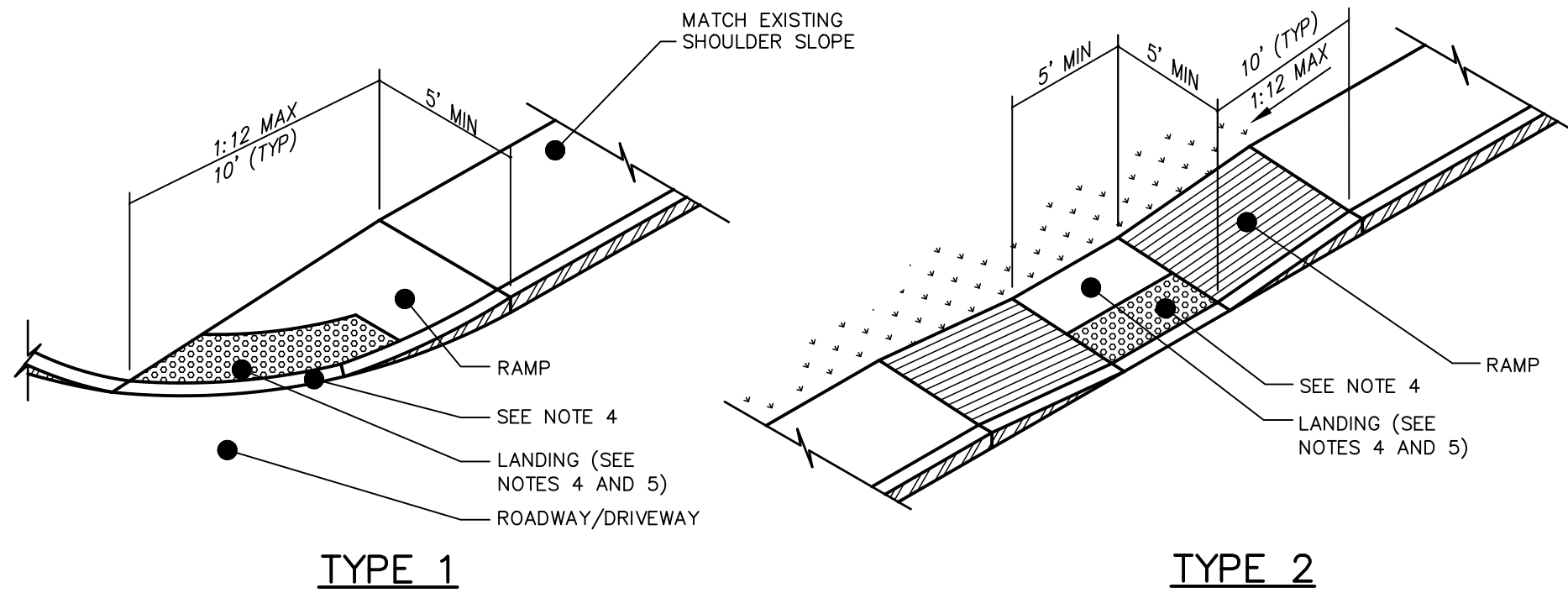
BH2M
Berry, Huff, MacDonald, Milligan Inc.
Engineers, Surveyors
380B Main Street
Concord, Maine 04038
Tel: (207) 839-2771
www.bh2m.com

FOR
Indian Cliff Development Corp
260 Main Street
P.O. BOX 144
Biddeford, Maine

UTILITY DETAILS
BARRA ROAD SUBDIVISION
BARRA ROAD
BIDDEFORD, MAINE

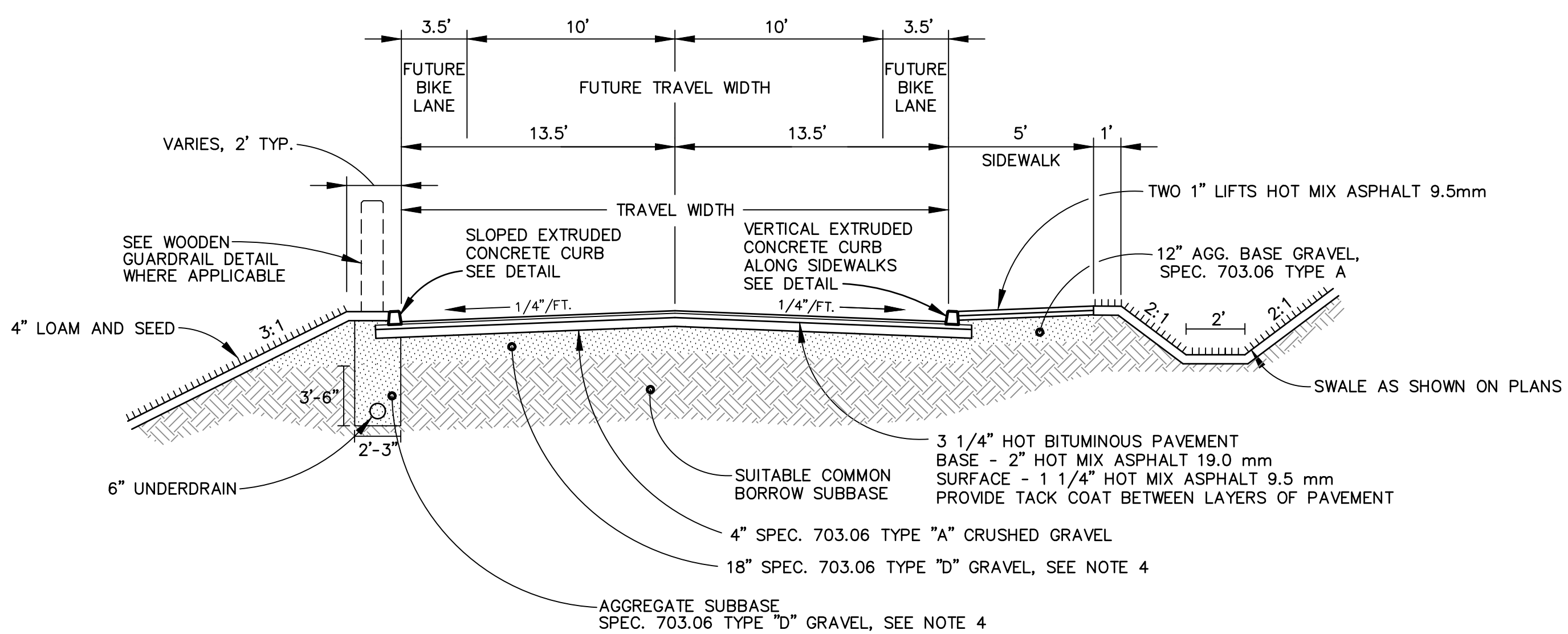
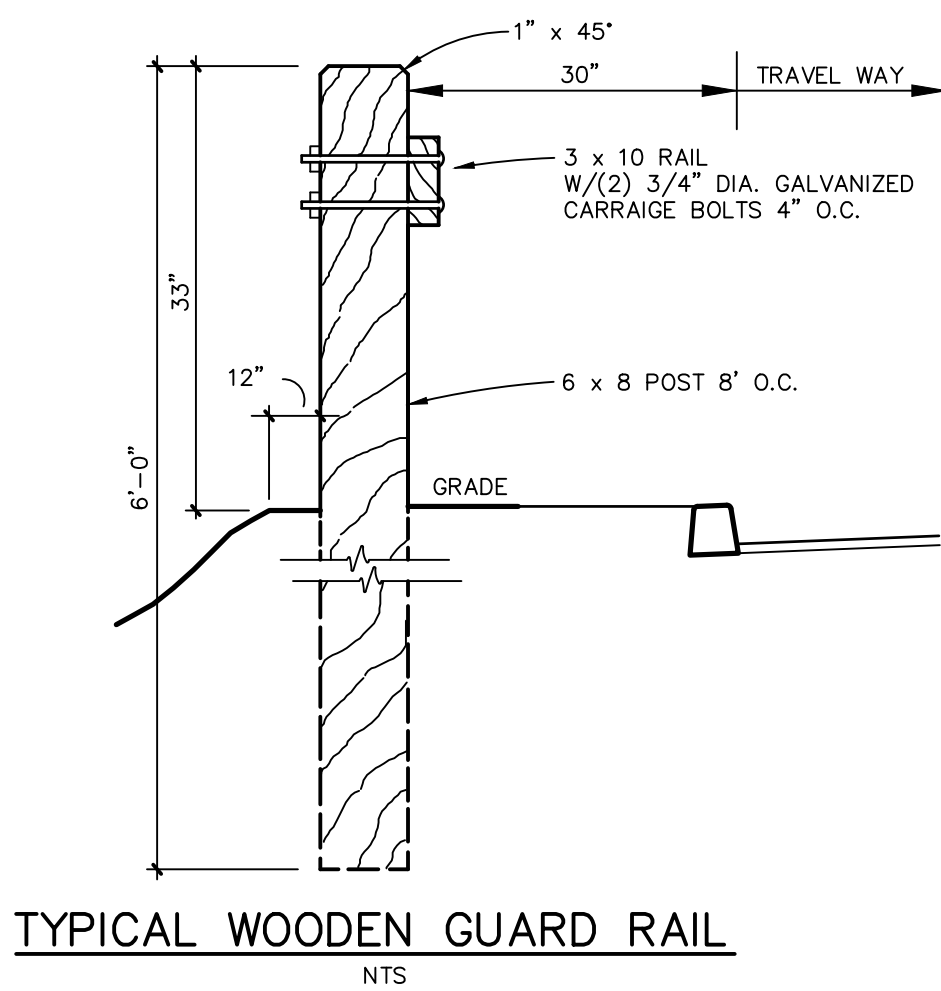
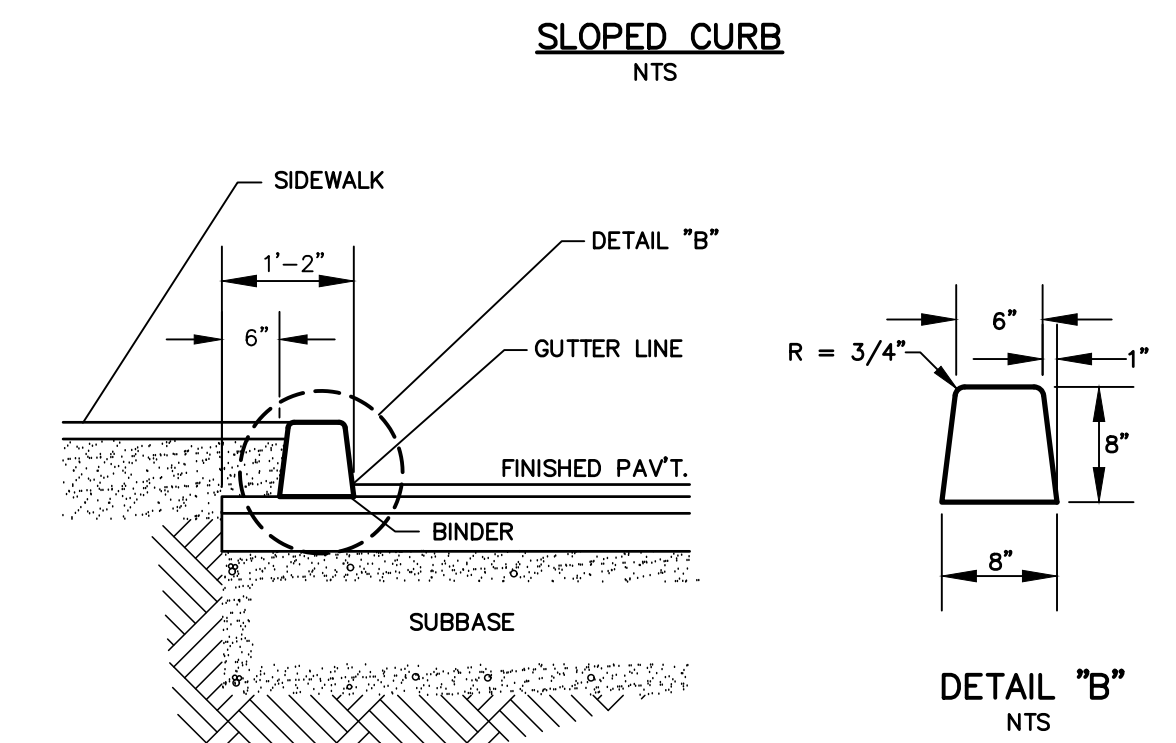
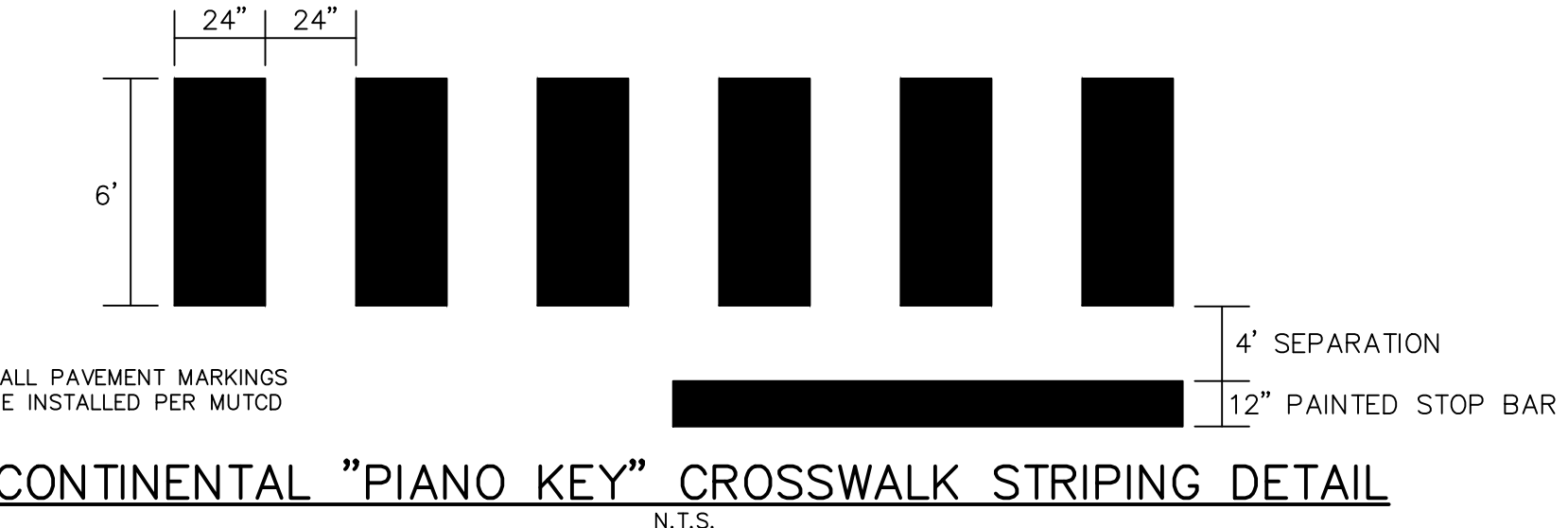
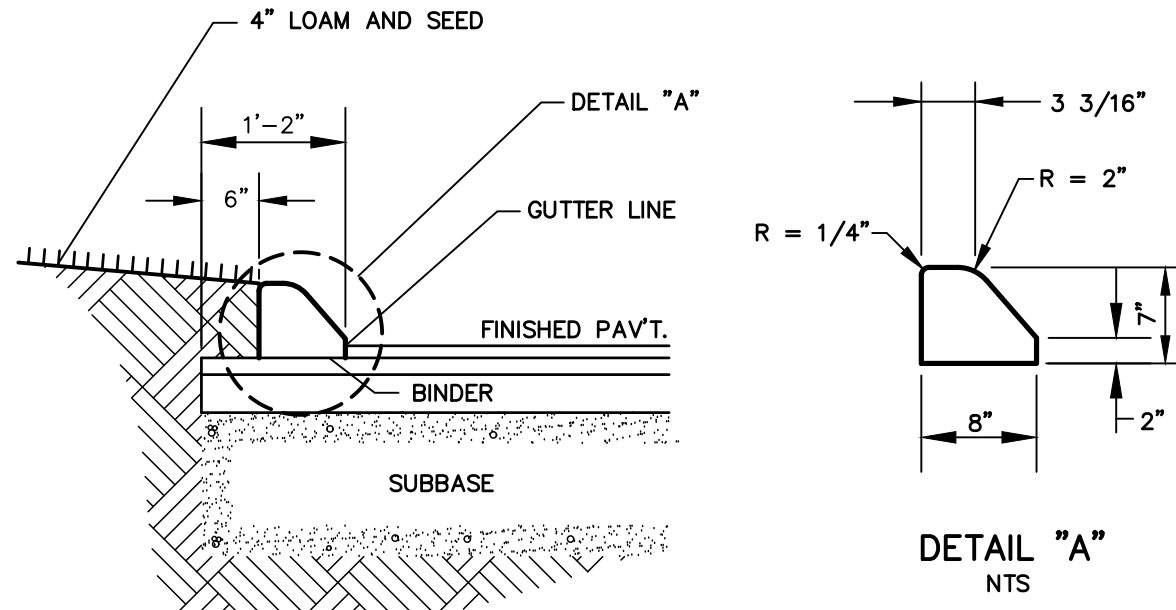
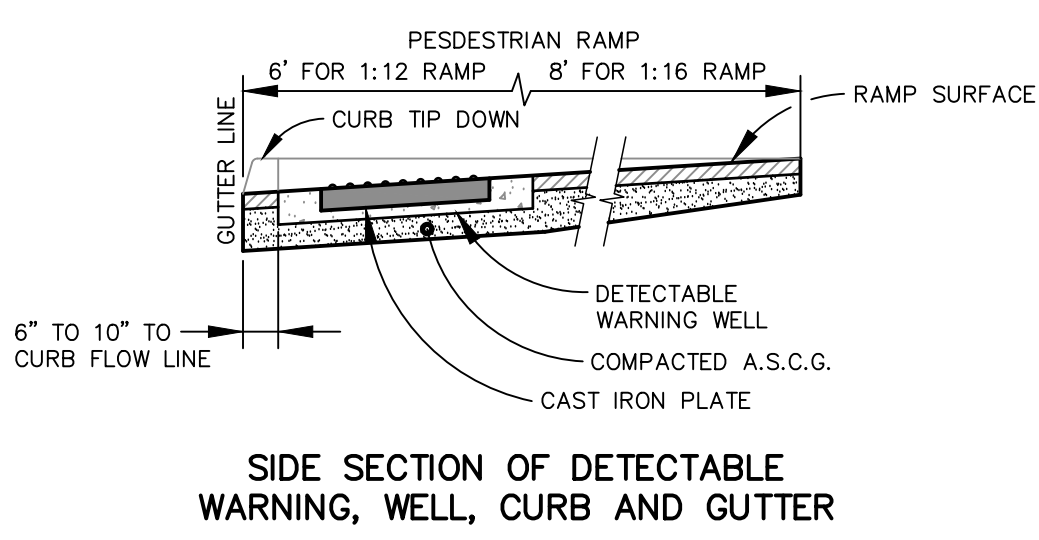
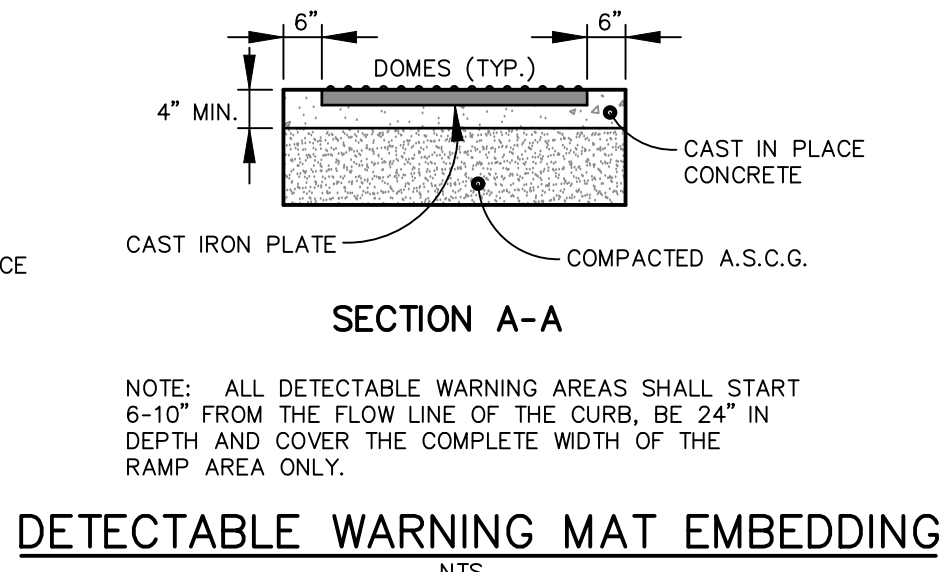
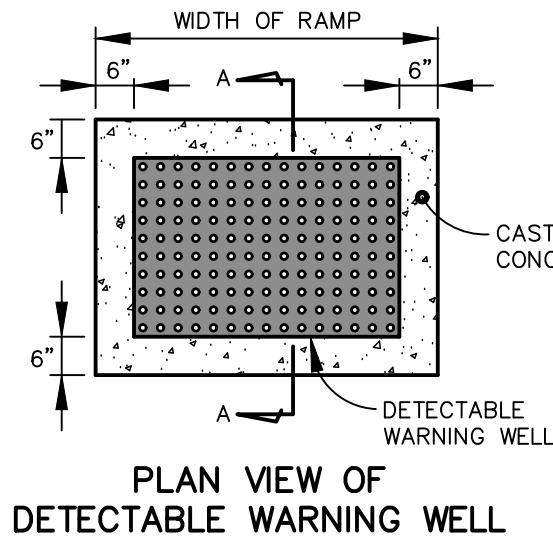
DESIGNED C. MacDonald	DATE May 2024
DRAWN Dept.	SCALE As Noted
CHECKED C. MacDonald	JOB. NO. 22056

SHEET
7
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NOTE:

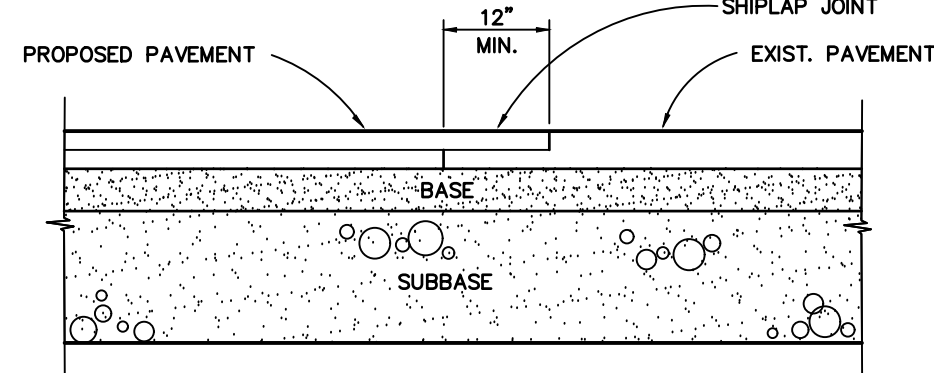
- CURB RAMP LENGTHS ARE BASED ON SIX (6) INCH CURB REVEAL HEIGHT AND NO RUNNING SLOPE. RAMP LENGTHS SHALL BE ADJUSTED AS NECESSARY TO ACCOMMODATE VARYING CURB REVEAL HEIGHTS AND TO MATCH RUNNING SLOPES OF ADJACENT ROADWAY AND SIDEWALK SLOPES TO MAINTAIN A RAMP THAT DOES NOT EXCEED THE MAXIMUM RAMP SLOPE OF 1:12.
- DETECTABLE WARNINGS SHALL CONSIST OF RAISED TRUNCATED DOMES AND SHALL HAVE A BASE DIAMETER OF 0.9 INCHES (23 mm) MINIMUM AND 1.4 INCHES (36 mm) MAXIMUM; A TOP DIAMETER OF 50 PERCENT OF THE BASE DIAMETER MINIMUM TO 65 PERCENT OF THE BASE DIAMETER MAXIMUM AND A HEIGHT OF 0.2 INCHES (5.1 mm). A CENTER-TO-CENTER SPACING OF 1.6 INCHES (41mm) MINIMUM AND 2.4 INCHES (61mm) MAXIMUM; AND A BASE-TO-BASE SPACING OF 0.65 INCHES (17mm) MINIMUM, MEASURED BETWEEN THE MOST ADJACENT DOMES ON A SQUARE GRID.
- DETECTABLE WARNINGS SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE. DETECTABLE WARNINGS USED ON INTERIOR SURFACES SHALL DIFFER FROM ADJOINING WALKING SURFACES IN RESILIENCY OR SOUND-ON-CANE CONTACT.
- ALL ACCESSIBLE ROUTE SIDEWALKS INTERSECTING ROADWAYS, DRIVEWAYS, OR OTHER VEHICULAR CROSSINGS REQUIRE DETECTABLE WARNINGS. DETECTABLE WARNING ZONES SHALL BE INSTALLED SIX (6) INCHES (OR THE HORIZONTAL THICKNESS OF THE ADJACENT CURB) FROM THE FLOW LINE OF THE CURB, EXTEND INTO THE SIDEWALK FOR A 24" DEPTH, AND COVER THE COMPLETE WIDTH OF THE SIDEWALK OR RAMP AREA. DETECTABLE WARNING ZONES SHALL CONFORM TO THE SLOPE REQUIREMENTS OF THE RAMP, LANDING, OR ACCESSIBLE ROUTE AS DEFINED IN THE SPECIFIED DETAIL. DETECTABLE WARNINGS SHALL NOT BE INSTALLED IN FLARED SIDES, IF THE RAMP INCLUDES FLARED SIDES.
- ALL LANDING AREAS SHALL BE 4 FEET WIDE BY 4 FEET LONG (MINIMUM DIMENSIONS). THE SLOPE OF THE LANDING AREA SHALL NOT EXCEED A 1:48 IN ANY DIRECTION.
- ALL ACCESSIBLE ROUTE SLOPES ADJOINING THE LANDING AREA, EXCLUDING THE CURB RAMP, SHALL NOT EXCEED A SLOPE OF 1:20 UNLESS OTHERWISE NOTED.



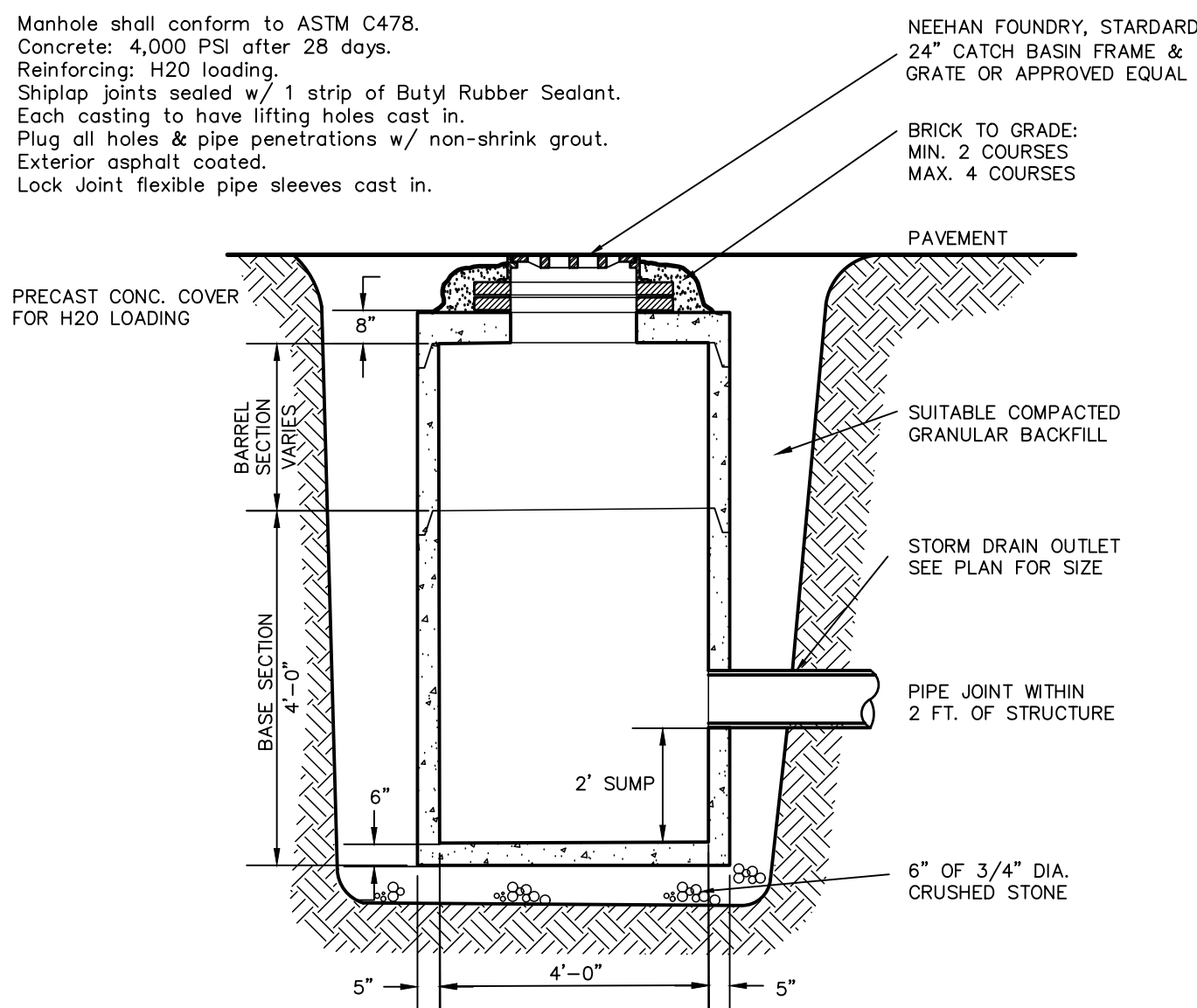
NOTES:

- ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO MDOT STANDARDS SPECIFICATIONS, REVISED MARCH 2020, AND MOST RECENT SUPPLEMENTAL SPECIFICATIONS.
- SEE MDOT 401 FOR MATERIALS AND MDOT 413 FOR INSTALLATION.
- ALL MATERIALS SHALL BE COMPACTED TO ACHIEVE 95% OF MAXIMUM DENSITY.
- AGGREGATE SUBBASE SHALL MEET THE REQUIREMENTS OF MAINE DOT SPECIFICATION 703.06 TYPE D, WITH THE EXCEPTION THAT THE AGGREGATE SUBBASE SHALL NOT CONTAIN PARTICLES OF ROCK THAT WILL NOT PASS THE 4 INCH SQUARE MESH SIEVE.

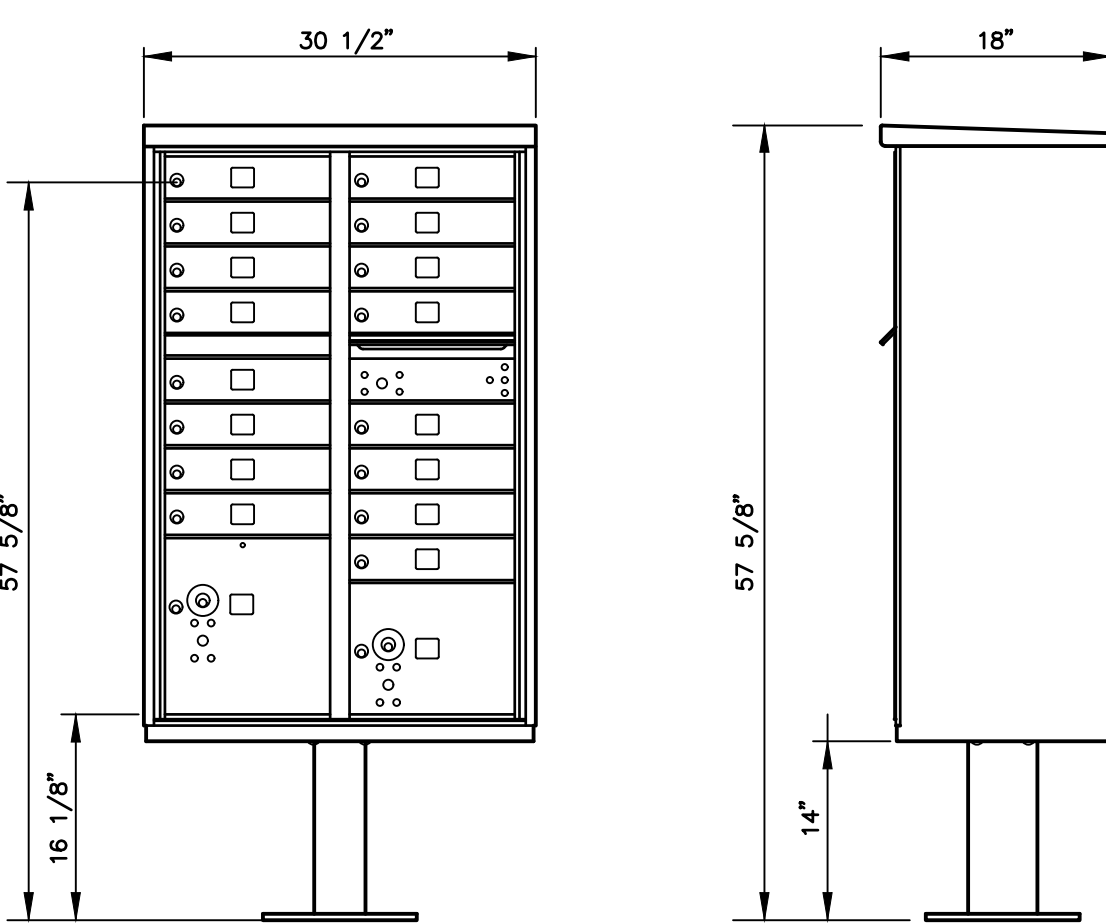
ROAD TYPICAL SECTION



PAVEMENT JOINT DETAIL



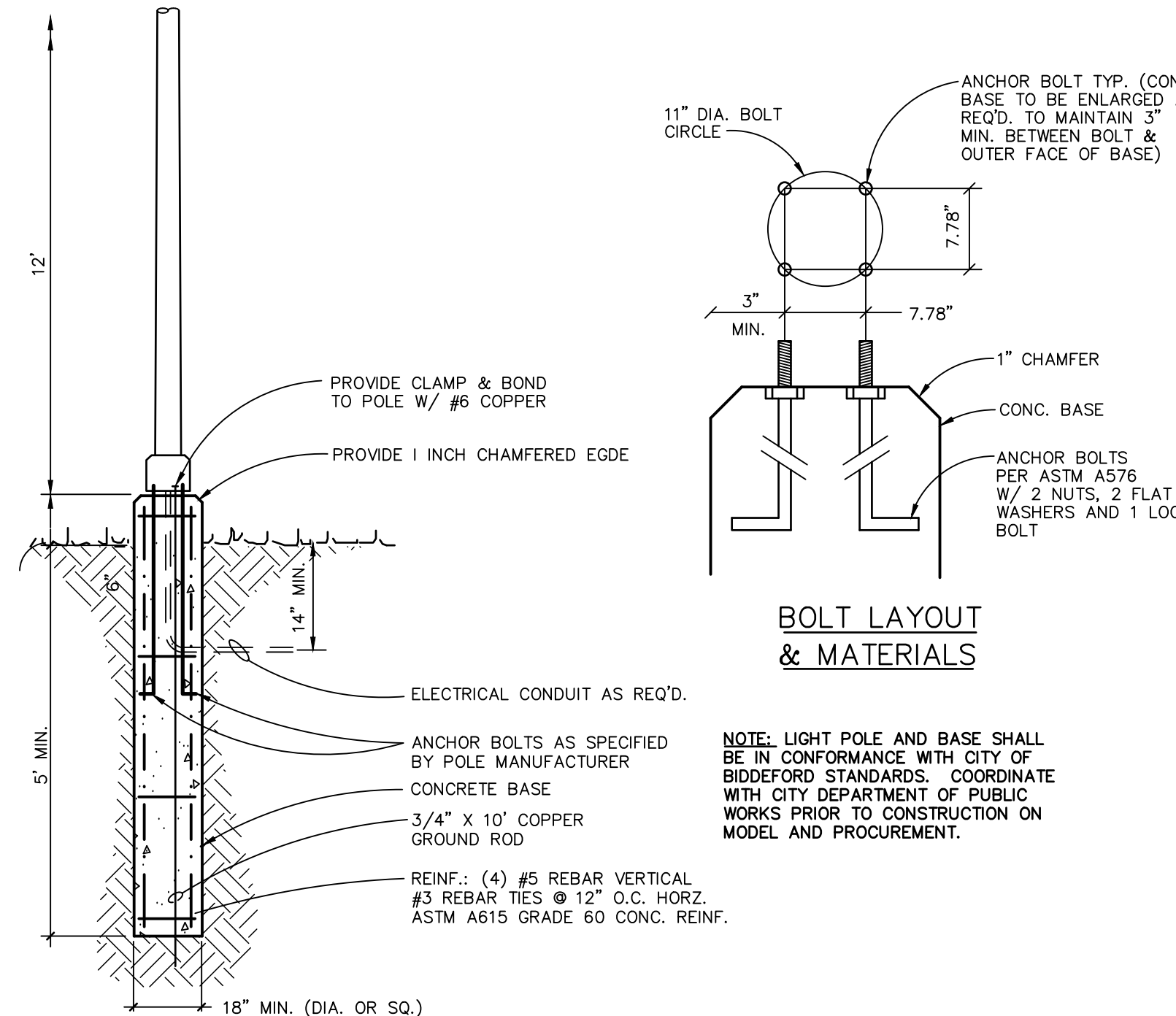
PRECAST CONCRETE CATCH BASIN DETAIL



NOTES:

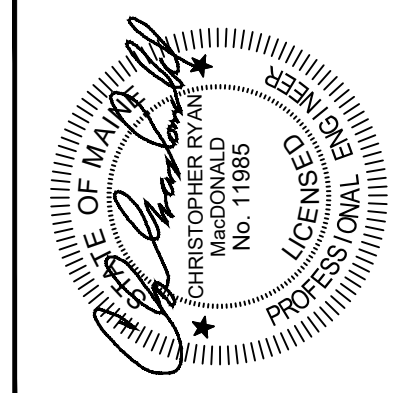
- CLUSTER MAILBOX UNIT SHALL BE APPROVED FOR USPS APPLICATION.
- CONTRACTOR/OWNER SHALL SUBMIT TECHNICAL MATERIALS TO LOCAL POSTAL SERVICE FOR APPROVAL.
- DIMENSIONS SHOWN ARE APPROXIMATE FOR 16 DOOR CLUSTER MAILBOX FOR USE BY THE PROPOSED 7 DUPLEX LOTS.
- SEE MANUFACTURERS SPECS. FOR UNIT FOUNDATION AND MOUNTING.

CLUSTER MAILBOX



LIGHT POLE DETAIL

NO.	DATE	REVISION	DESCRIPTION
1	5/15/24		Submitted for Preliminary Permit Application
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BH2M

FOR

Indian Cliff Development Corp

260 Main Street

P.O. BOX 144

Biddeford, Maine

Berry, Huff, MacDonald, Miligan Inc.

Engineers, Surveyors

380B Main Street

Corlum, Maine 04038

Tel: (207) 839-2771

www.bh2m.com

DETAILS A

BARRA ROAD SUBDIVISION

BARRA ROAD

BIDDEFORD, MAINE

DESIGNED	DATE
C. MacDonald	May 2024
DRAWN	SCALE
Dept.	As Noted
CHECKED	JOB. NO.
C. MacDonald	22056

SHEET

8

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- GRASSED UNDERDRAIN SOIL FILTER NOTES**
- REFERENCES**
1. MAINE STORMWATER BEST MANAGEMENT PRACTICES (BMP), VOLUME III BMP TECHNICAL DESIGN MANUAL, CHAPTER 7 FILTRATION BMP'S (LATEST REVISION).
- CONSTRUCTION METHODS**
1. THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION MATERIALS, INSTALLATION, MEANS, METHODS, AND SCHEDULING.
 2. ALL WORK SHALL BE IN CONFORMANCE WITH THE PROJECT PLANS AND BMP'S REFERENCED ABOVE.
 3. THE SOIL FILTER MEDIA AND VEGETATION SHALL NOT BE INSTALLED UNTIL THE AREA THAT DRAINS TO THE FILTER HAS BEEN PERMANENTLY STABILIZED WITH PAVEMENT OR OTHER STRUCTURES, 90% VEGETATION COVER OR PERMANENT STABILIZATION.
- DE-WATERING PLAN**
1. DURING CONSTRUCTION OF THE SITE AND VEGETATED SOIL FILTER, THE CONTRACTOR SHALL BE PREPARED TO IMPLEMENT A DEWATERING PLAN IN ANTICIPATION OF HEAVY RAIN EVENTS.
 2. THE AREA OF THE BASIN MAY BE EXCAVATED IN PREPARATION OF THE INSTALLATION OF THE UNDERDRAIN AND MAY BE USED FOR A SEDIMENT TRAP FOR THE SITE DURING CONSTRUCTION. AFTER EXCAVATION OF THE BASIN, THE OUTLET STRUCTURE AND PIPING SYSTEM SHALL BE INSTALLED AT THE APPROPRIATE ELEVATION AND PROTECTED WITH A SEDIMENT BARRIER. THE BASIN IS TO BE USED AS A SEDIMENT TRAP. THE SIDES OF THE EMBANKMENTS MUST BE MULCHED AND MAINTAINED TO PREVENT EROSION.
- SOIL MEDIA**
1. THE SOIL MEDIA SHALL CONSIST OF SILTY SANDY SOIL OR SOIL MIXTURE COMBINED WITH 20% TO 25% BY VOLUME (NO LESS THAN 10% BY DRY WEIGHT) OF MODERATELY SHREDED BARK OR WOOD FIBER MULCH.
 2. THE SOIL FILTER MEDIA SAND SHALL MEET THE GRADATION IN TABLE 7-2 (MDOOT 703.01) WITH ADDITIONAL FINES ADDED IF NECESSARY.
 3. THE RESULTING SOIL FILTER MEDIA SHALL HAVE 8% TO 12% BY WEIGHT PASSING THE #200 SIEVE AND SHALL HAVE A CLAY CONTENT OF LESS THAN 2%.
 4. THE COARSE GRAVEL MATERIAL SHALL MEET THE GRADATION OF TABLE 7.1 (MDOOT 703.22 UNDERDRAIN, TYPE B).
 5. THE FILTER MEDIA SHALL BE LIGHTLY COMPACTED BY SATURATING THE MEDIA IN 6" TO 9" LIFTS AND SHALL HAVE A PERMEABILITY OF 2.4 IN/HR TO 4 IN/HR.
 6. THE CLAY CONTENT SHALL BE < 2%.
- CONSTRUCTION**
1. SOIL FILTER MEDIA, COARSE GRAVEL, AND UNDERDRAIN BEDDING MATERIAL SHALL BE COMPACTED TO BETWEEN 90% AND 92% STANDARD PROCTOR.
 2. PERFORATED UNDERDRAIN PIPE SHALL BE 4" AND 6" SCHEDULE 40 OR SDR 35 PVC PIPE. SPACED 8 FEET AND 4 FEET ON CENTER AS SHOWN ON PLANS.
 3. TRIBUTARY AREAS SHALL BE STABILIZED PRIOR TO INSTALLATION OF THE SOIL FILTER MEDIA MIXTURE AND UNDERDRAIN. STABILIZED IS DEFINED AS PAVED IF IN A PARKING AREA OR ROADWAY AND 90% GRASS CATCH IF IN A VEGETATED AREA.
 4. OUTFLOW OF THE VEGETATED SOIL FILTER SHALL BE CONTROLLED BY A 2" PLASTIC TYPE 34-6 BALL VALVE WITH TYPE 615 BALL VALVE HANDLE EXTENSION (AVAILABLE FROM E.J. PRESCOTT OR EQUIVALENT). A THREE-PIECE VALVE BOX (AVAILABLE FROM E.J. PRESCOTT OR EQUIVALENT) SHALL BE INSTALLED OVER THE VALVE.
 5. ALL EQUIPMENT USED WITHIN THE LIMITS OF THE VEGETATED SOIL FILTER SHALL BE LOW GROUND PRESSURE VEHICLES (LESS THAN 2.0 PSI) WHEN FULLY LOADED.
 6. IF VEGETATION IS NOT ESTABLISHED WITHIN THE FIRST YEAR, THE CONTRACTOR SHALL INSTALL A 2-3 INCH LAYER OF LOAM (WITH LESS THAN 2% CLAY AS TESTED VIA HYDROMETER TEST) ON THE SURFACE OF THE GRASS FILTER AND RE-SEED MULCH.
 7. THE SURFACE OF THE VEGETATED SOIL FILTER SHALL BE PLANTED WITH A GRASS SPECIES THAT IS TOLERANT OF FREQUENT INUNDATION AND WELL-DRAINED SOILS. UPON SEEDING, THE SURFACES SHALL BE MULCHED WITH HAY OR AN EROSION CONTROL BLANKET BUT SHALL NOT BE FERTILIZED. AN APPROPRIATE SEED MIXTURE SHOULD CONTAIN THE FOLLOWING OR BE AN EQUIVALENT CONSERVATION TYPE MIX:
- | | |
|---------------------|-------------|
| CREeping RED FESCUE | 20 LBS/ACRE |
| TALL FESCUE | 20 LBS/ACRE |
| BIRDFOOT TREFOIL | 5 LBS/ACRE |
| TOTAL | 45 LBS/ACRE |
- TESTING AND SUBMITTALS**
1. THE CONTRACTOR SHALL IDENTIFY THE LOCATION OF THE SOURCE OF EACH COMPONENT OF THE FILTER MEDIA. ALL TESTING RESULTS SHALL BE SUBMITTED TO THE PROJECT ENGINEER.
 2. SUBMIT SAMPLES OF EACH TYPE OF MATERIAL TO BE BLENDED FOR THE MIXED FILTER MEDIA AND SAMPLES OF THE UNDERDRAIN BEDDING MATERIAL. SAMPLES MUST BE A COMPOSITE OF THREE DIFFERENT LOCATIONS (GRABS) FROM THE STOCKPILE OR PIT FACE. SAMPLE SIZE WILL BE DETERMINED BY TESTING LABORATORY.
 3. THE CONTRACTOR SHALL PERFORM A SIEVE ANALYSIS CONFORMING TO ASTM C136 (STANDARD TEST METHODS FOR SIEVE ANALYSIS OF FINE AND COARSE AGGREGATES, 1996A) ON EACH TYPE OF SAMPLE MATERIAL INCLUDING A HYDROMETER TEST FOR CLAY CONTENT.
 4. THE CONTRACTOR SHALL PERFORM A PERMEABILITY TEST ON THE SOIL MEDIA MIXTURE CONFORMING TO ASTM D2434.
 5. THE CONTRACTOR SHALL PERFORM ONE COMPACTION DENSITY TEST ON THE IN-PLACE SOIL FILTER MEDIA FOR EVERY 1,500 S.F. OF BED OR FRACTION THEREOF. THE TEST SHALL CONFORM TO ASTM 2922.
 6. UPON COMPLETION OF THE VEGETATED SOIL FILTER MEDIA AND THE ESTABLISHMENT OF 90% CATCH OF GRASS OVER THE FILTER MEDIA, THE CONTRACTOR SHALL FLOOD THE VEGETATED BASIN TO THE SPILLWAY WITH CLEAR WATER AND ADJUST THE OUTFLOW TO OBTAIN A 24-HOUR TO 32-HOUR RELEASE TIME.
- CONSTRUCTION OVERSIGHT**
1. THE CONTRACTOR SHALL MEET THE "CONSTRUCTION OVERSIGHT" SECTION OF CHAPTER 7, FILTRATION BMP'S (REVISED MAY 2016) OF THE STORMWATER MANAGEMENT FOR MAINE, VOLUME III, BMP'S TECHNICAL DESIGN MANUAL.
 2. THE DESIGN ENGINEER SHALL BE CONDUCTING PERIODIC SITE OVERSIGHT OF THE CONSTRUCTION AS DESCRIBED BELOW AND IN COMPLIANCE WITH THE PERMITS.
 3. THE ENGINEER SHALL REVIEW AND APPROVE ALL CONTRACTOR SUBMITTALS.
 4. THE CONTRACTOR SHALL GIVE THE ENGINEER A PROPOSED CONSTRUCTION SCHEDULE AND A 48-HOUR NOTICE FOR ALL SITE VISITS.
 5. INSPECTIONS SHALL INCLUDE:
 - PRE-CONSTRUCTION MEETING WITH CONTRACTOR
 - INSPECTION OF SUBGRADE EXCAVATION (IF USED FOR SEDIMENT TRAP, INSPECTION AFTER RESHAPED)
 - INSPECTION OF LINER WHEN IN PLACE (PRIOR TO BACKFILL AND INSTALLATION OF FILTER MATERIALS)
 - AFTER FILTER MEDIA HAS BEEN INSTALLED AND SURFACE HAS BEEN SEED
 - AFTER ONE YEAR TO INSPECT VEGETATION UPTAKE AND OBSERVE FLOODING TEST IF CONDUCTED

TABLE 7-1
UNDERDRAIN SPECS.
MDOOT #703.22

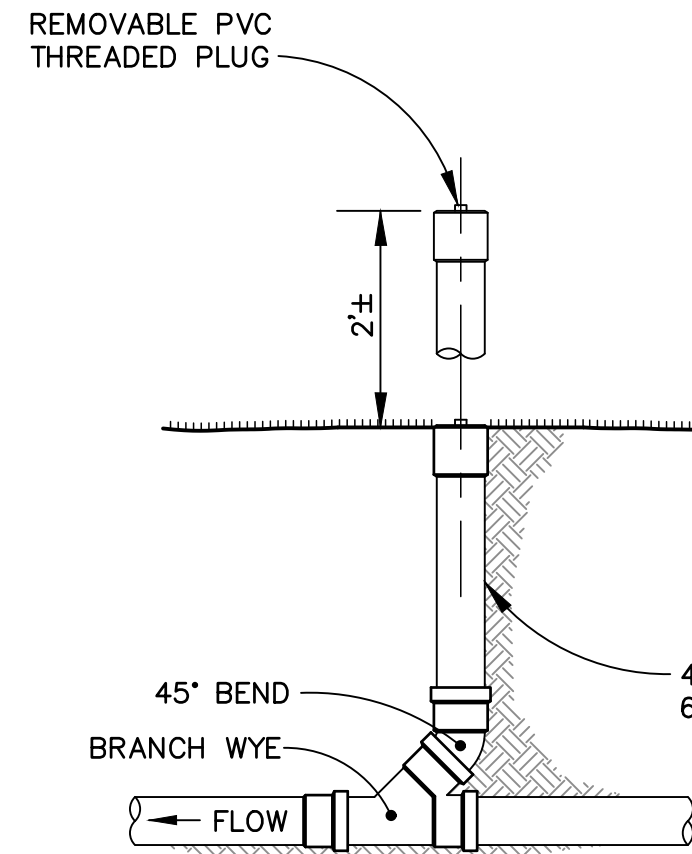
SIEVE SIZE	% BY WEIGHT
UNDERDRAIN TYPE B	
1" 12"	90-100
1/2"	75-100
#4	50-100
#20	15-60
#50	0-15
#200	0-5

TABLE 7-2
AGGREGATE SPECS.
MDOOT #703.01

SIEVE SIZE	% BY WEIGHT
UNDERDRAIN TYPE C	
3/4"	100
3/8"	90-100
#4	0-75
#10	0-25
#20	0-5

TABLE 7-4
COARSE LOAMY SAND SIEVE
ANALYSIS SPECIFICATION

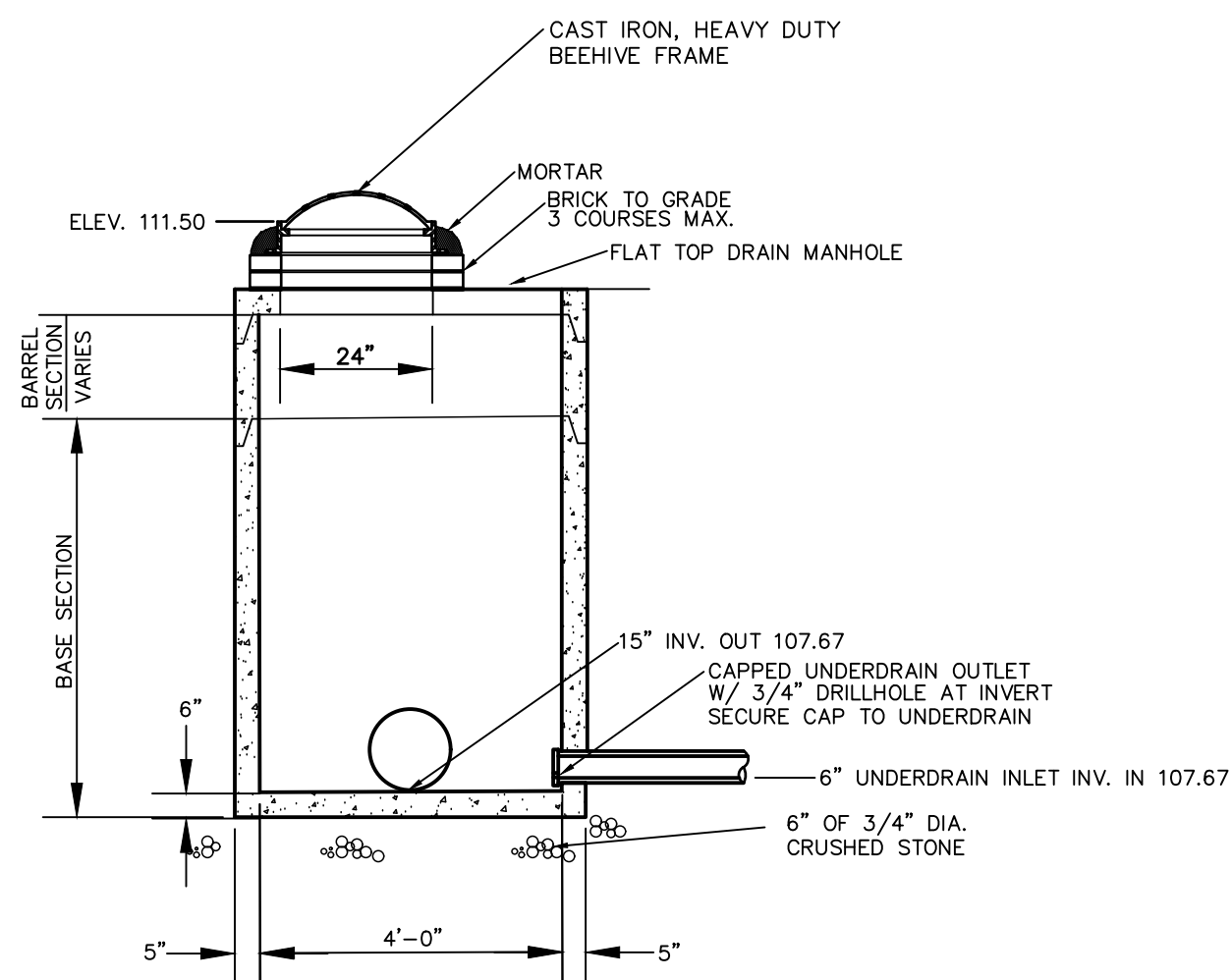
SIEVE #	% PASSING BY WEIGHT
#10	85-100
#20	70-100
#50	15-40
#200	6-15



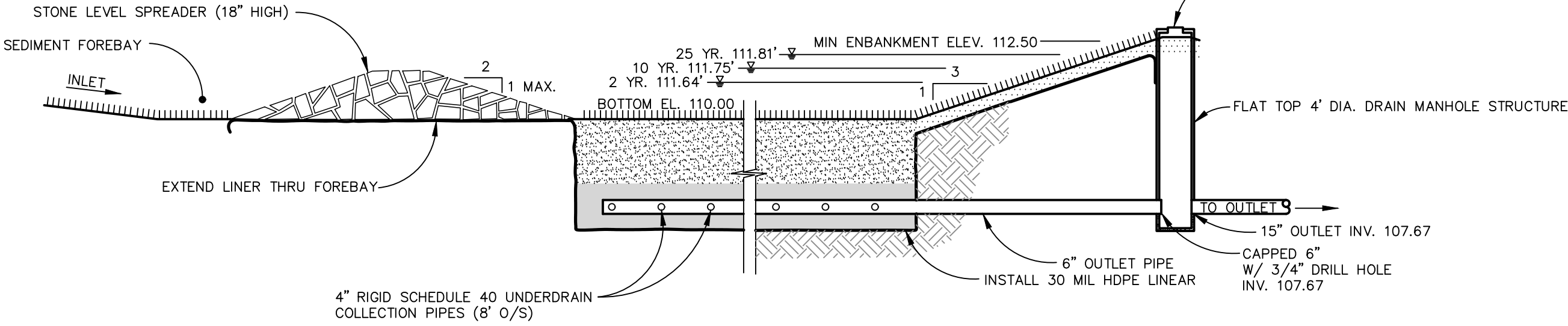
CLEANOUT DETAIL
N.T.S.

LEVEL SPREADER STONE SIZE

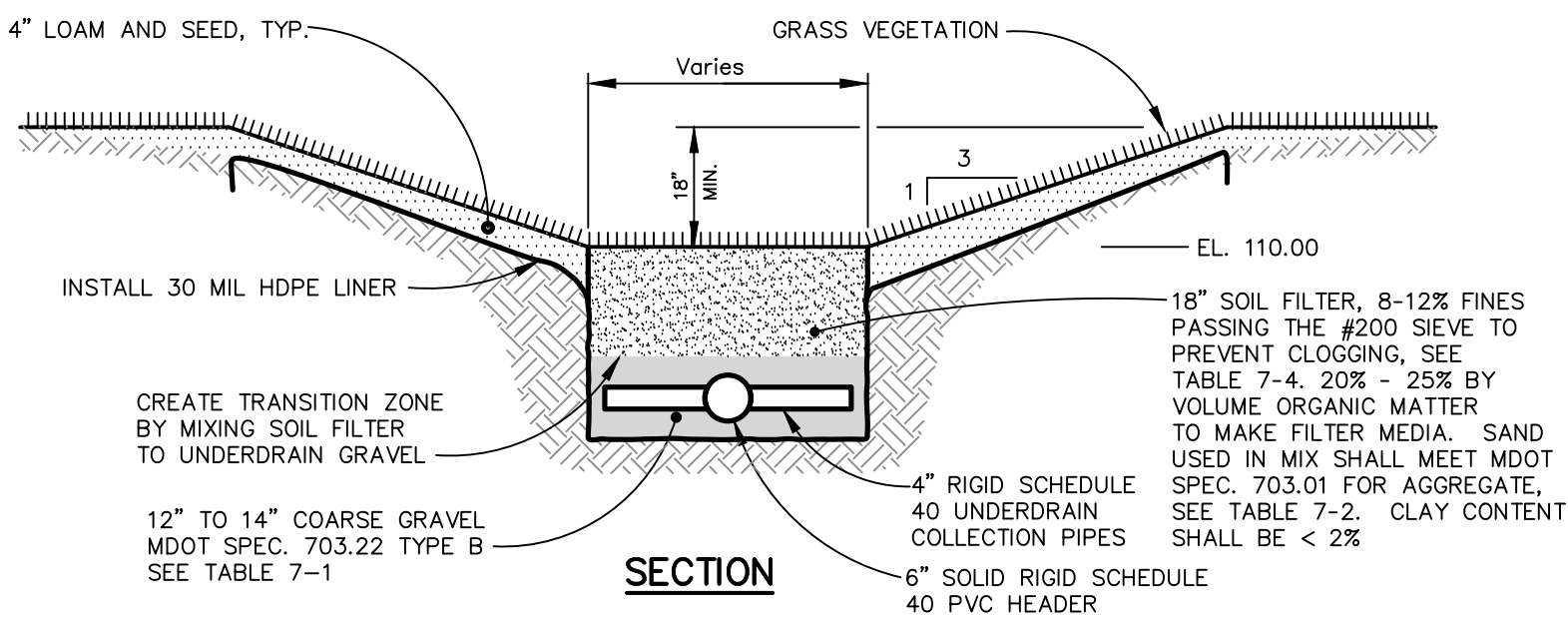
SIEVE DESIGNATION	US CUSTOMARY	% BY WEIGHT PASSING
300 MM	12"	100
150 MM	6"	84-100
75 MM	3"	68-83
25.4 MM	1"	42-55
4.75 MM	NO. 4	8-12



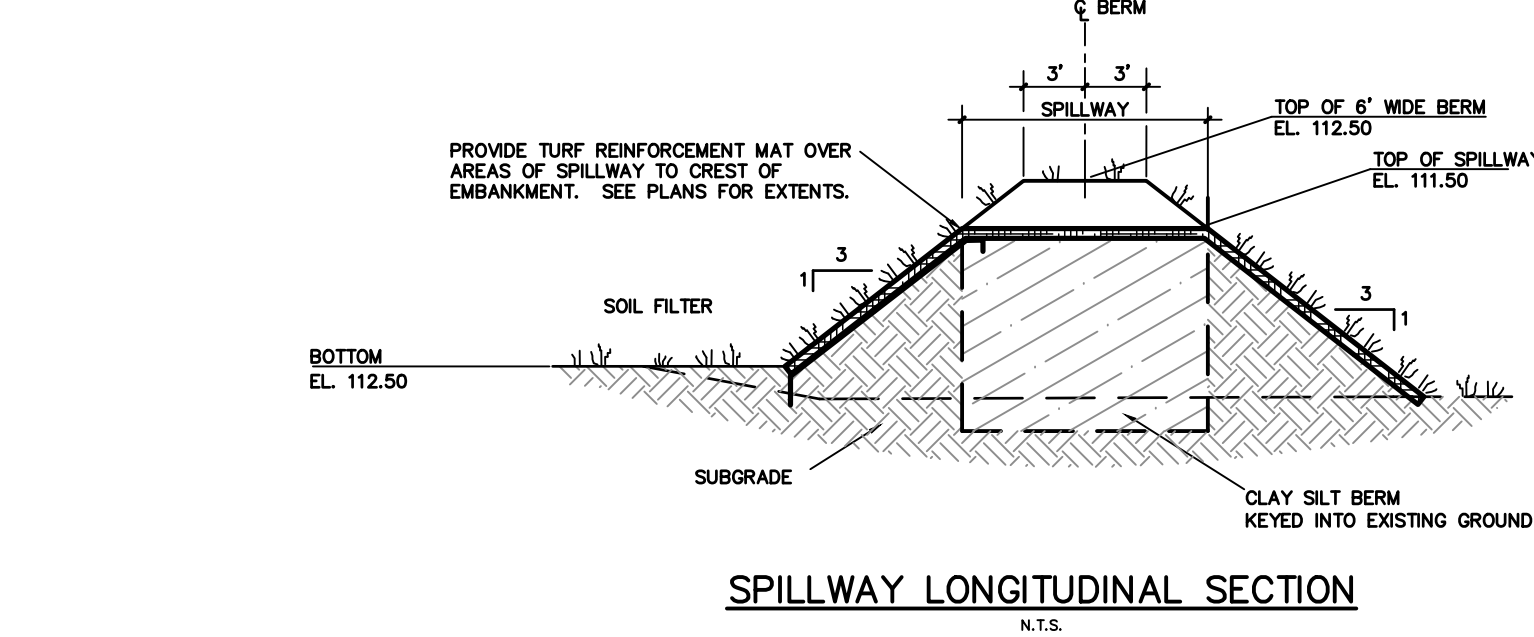
OUTLET CONTROL STRUCTURE 2
N.T.S.



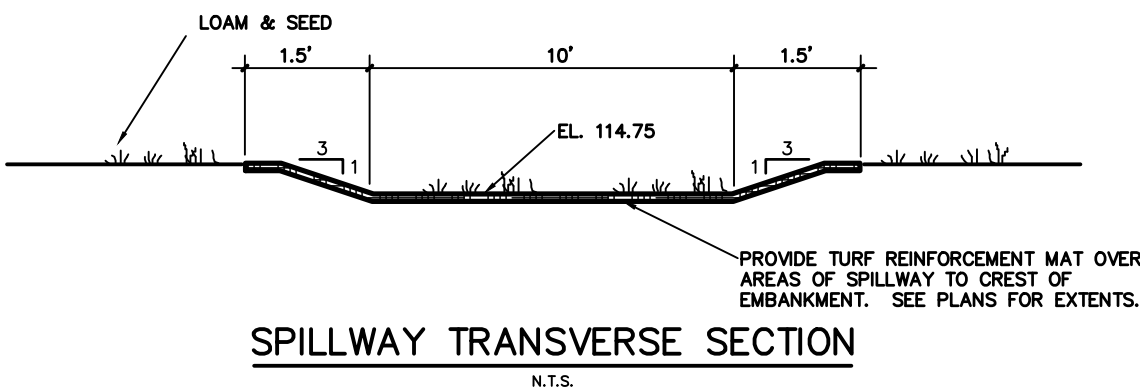
PROFILE
N.T.S.



GRASSED UNDERDRAIN
SOIL FILTER
N.T.S.

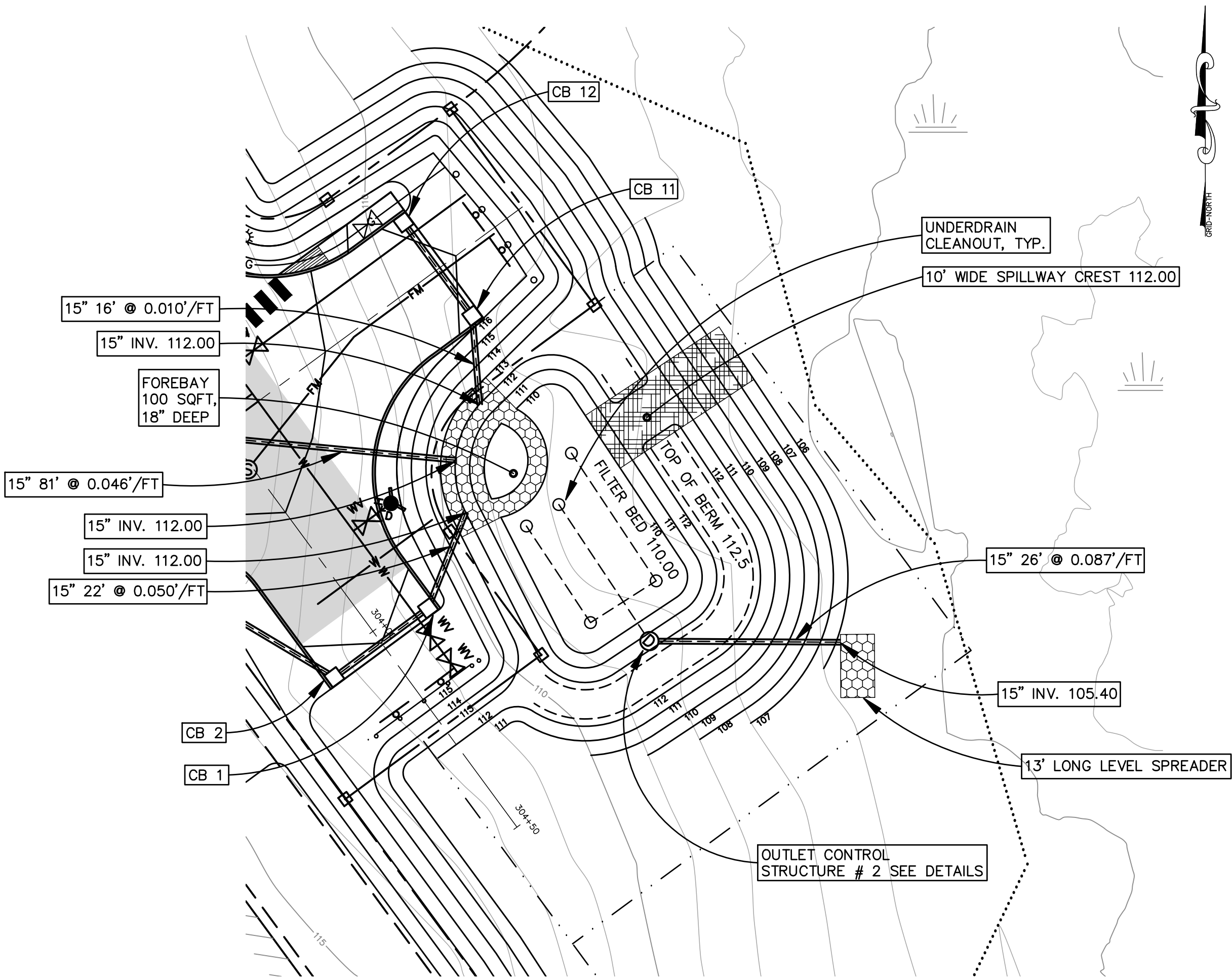


SPILLWAY LONGITUDINAL SECTION
N.T.S.

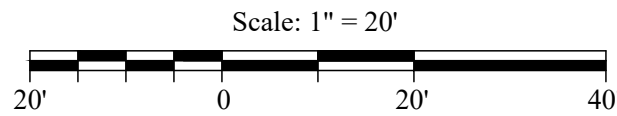


SPILLWAY TRANSVERSE SECTION
N.T.S.

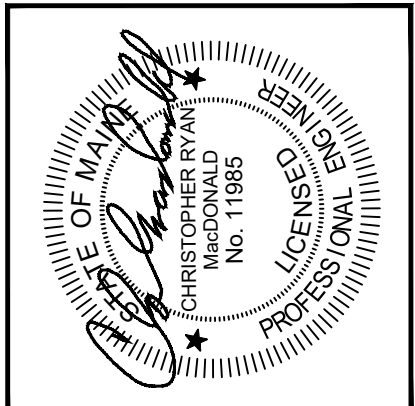
EMBANKMENT AND SPILLWAY DETAIL
N.T.S.



GRASSED UNDERDRAINED SOIL FILTER 2 PLAN
N.T.S.



NO.	DATE	REVISION	DESCRIPTION
1	5/15/24		Submitted for Preliminary Permit Application
2	7/17/24		Submitted for Final Permit Application



BH2M

Berry Huff, MacDonald, Milligan Inc.
Engineers, Surveyors

380B Main Street
Gorham, Maine 04038

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FOR

Indian Cliff Development Corp
260 Main Street
P.O. Box 444
Biddeford, Maine

GRASSED UNDERDRAINED
SOIL FILTER 2 DETAILS

BARRA ROAD SUBDIVISION

BARRA ROAD
BIDDEFORD, MAINE

DESIGNED C. MacDonald	DATE May 2024
DRAWN Staff	SCALE As Noted
CHECKED C. MacDonald	JOB. NO. 24017

SHEET

9

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- GRASSED UNDERDRAIN SOIL FILTER NOTES**
- REFERENCES**
- MAINE STORMWATER BEST MANAGEMENT PRACTICES (BMP), VOLUME III BMP TECHNICAL DESIGN MANUAL, CHAPTER 7 FILTRATION BMP'S (LATEST REVISION).
- CONSTRUCTION METHODS**
- THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION MATERIALS, INSTALLATION, MEANS, METHODS, AND SCHEDULING.
 - ALL WORK SHALL BE IN CONFORMANCE WITH THE PROJECT PLANS AND BMP'S REFERENCED ABOVE.
 - THE SOIL FILTER MEDIA AND VEGETATION SHALL NOT BE INSTALLED UNTIL THE AREA THAT DRAINS TO THE FILTER HAS BEEN PERMANENTLY STABILIZED WITH PAVEMENT OR OTHER STRUCTURES, 90% VEGETATION COVER OR PERMANENT STABILIZATION.
- DE-WATERING PLAN**
- DURING CONSTRUCTION OF THE SITE AND VEGETATED SOIL FILTER, THE CONTRACTOR SHALL BE PREPARED TO IMPLEMENT A DEWATERING PLAN IN ANTICIPATION OF HEAVY RAIN EVENTS.
 - THE AREA OF THE BASIN MAY BE EXCAVATED IN PREPARATION OF THE INSTALLATION OF THE UNDERDRAIN AND MAY BE USED FOR A SEDIMENT TRAP FOR THE SITE DURING CONSTRUCTION. AFTER EXCAVATION OF THE BASIN, THE OUTLET STRUCTURE AND PIPING SYSTEM SHALL BE INSTALLED AT THE APPROPRIATE ELEVATION AND PROTECTED WITH A SEDIMENT BARRIER. THE BASIN IS TO BE USED AS A SEDIMENT TRAP. THE SIDES OF THE EMBANKMENTS MUST BE MULCHED AND MAINTAINED TO PREVENT EROSION.
- SOIL MEDIA**
- THE SOIL MEDIA SHALL CONSIST OF SILTY SANDY SOIL OR SOIL MIXTURE COMBINED WITH 20% TO 25% BY VOLUME (NO LESS THAN 10% BY DRY WEIGHT) OF MODERATELY SHREDED BARK OR WOOD FIBER MULCH.
 - THE SOIL FILTER MEDIA SAND SHALL MEET THE GRADATION IN TABLE 7-2 (MDOT 703.01) WITH ADDITIONAL FINES ADDED IF NECESSARY.
 - THE RESULTING SOIL FILTER MEDIA SHALL HAVE 8% TO 12% BY WEIGHT PASSING THE #200 SIEVE AND SHALL HAVE A CLAY CONTENT OF LESS THAN 2%.
 - THE COARSE GRAVEL MATERIAL SHALL MEET THE GRADATION OF TABLE 7.1 (MDOT 703.22 UNDERDRAIN, TYPE B).
 - THE FILTER MEDIA SHALL BE LIGHTLY COMPACTED BY SATURATING THE MEDIA IN 6" TO 9" LIFTS AND SHALL HAVE A PERMEABILITY OF 2.4 IN/HR TO 4 IN/HR.
 - THE CLAY CONTENT SHALL BE < 2%.
- CONSTRUCTION**
- SOIL FILTER MEDIA, COARSE GRAVEL, AND UNDERDRAIN BEDDING MATERIAL SHALL BE COMPACTED TO BETWEEN 90% AND 92% STANDARD PROCTOR.
 - PERFORATED UNDERDRAIN PIPE SHALL BE 4" AND 6" SCHEDULE 40 OR SDR 35 PVC PIPE. SPACED 8 FEET AND 4 FEET ON CENTER AS SHOWN ON PLANS.
 - TRIBUTARY AREAS SHALL BE STABILIZED PRIOR TO INSTALLATION OF THE SOIL FILTER MEDIA MIXTURE AND UNDERDRAIN. STABILIZED IS DEFINED AS PAVED IF IN A PARKING AREA OR ROADWAY AND 90% GRASS CATCH IF IN A VEGETATED AREA.
 - OUTFLOW OF THE VEGETATED SOIL FILTER SHALL BE CONTROLLED BY A 2" PLASTIC TYPE 34-6 BALL VALVE WITH TYPE 615 BALL VALVE HANDLE EXTENSION (AVAILABLE FROM E.J. PRESCOTT OR EQUIVALENT). A THREE-PIECE VALVE BOX (AVAILABLE FROM E.J. PRESCOTT OR EQUIVALENT) SHALL BE INSTALLED OVER THE VALVE.
 - ALL EQUIPMENT USED WITHIN THE LIMITS OF THE VEGETATED SOIL FILTER SHALL BE LOW GROUND PRESSURE VEHICLES (LESS THAN 2.0 PSI) WHEN FULLY LOADED.
 - IF VEGETATION IS NOT ESTABLISHED WITHIN THE FIRST YEAR, THE CONTRACTOR SHALL INSTALL A 2-3 INCH LAYER OF LOAM (WITH LESS THAN 2% CLAY AS TESTED VIA HYDROMETER TEST) ON THE SURFACE OF THE GRASS FILTER AND RE-SEED/MULCH.
 - THE SURFACE OF THE VEGETATED SOIL FILTER SHALL BE PLANTED WITH A GRASS SPECIES THAT IS TOLERANT OF FREQUENT INUNDATION AND WELL-DRAINED SOILS. UPON SEEDING, THE SURFACES SHALL BE MULCHED WITH HAY OR AN EROSION CONTROL BLANKET BUT SHALL NOT BE FERTILIZED. AN APPROPRIATE SEED MIXTURE SHOULD CONTAIN THE FOLLOWING OR BE AN EQUIVALENT CONSERVATION TYPE MIX:
- | | |
|---------------------|-------------|
| CREeping RED FESCUE | 20 LBS/ACRE |
| TALL FESCUE | 20 LBS/ACRE |
| BROMEGRASS-TREFOIL | 8 LBS/ACRE |
| TOTAL | 48 LBS/ACRE |
- TESTING AND SUBMITTALS**
- THE CONTRACTOR SHALL IDENTIFY THE LOCATION OF THE SOURCE OF EACH COMPONENT OF THE FILTER MEDIA. ALL TESTING RESULTS SHALL BE SUBMITTED TO THE PROJECT ENGINEER.
 - SUBMIT SAMPLES OF EACH TYPE OF MATERIAL TO BE BLENDED FOR THE MIXED FILTER MEDIA AND SAMPLES OF THE UNDERDRAIN BEDDING MATERIAL. SAMPLES MUST BE A COMPOSITE OF THREE DIFFERENT LOCATIONS (GRABS) FROM THE STOCKPILE OR PIT FACE. SAMPLE SIZE WILL BE DETERMINED BY TESTING LABORATORY.
 - THE CONTRACTOR SHALL PERFORM A SIEVE ANALYSIS CONFORMING TO ASTM C136 (STANDARD TEST METHODS FOR SIEVE ANALYSIS OF FINE AND COARSE AGGREGATES, 1996A) ON EACH TYPE OF SAMPLE MATERIAL INCLUDING A HYDROMETER TEST FOR CLAY CONTENT.
 - THE CONTRACTOR SHALL PERFORM A PERMEABILITY TEST ON THE SOIL MEDIA MIXTURE CONFORMING TO ASTM D2434.
 - THE CONTRACTOR SHALL PERFORM ONE COMPACTION DENSITY TEST ON THE IN-PLACE SOIL FILTER MEDIA FOR EVERY 1,500 S.F. OF BED OR FRACTION THEREOF. THE TEST SHALL CONFORM TO ASTM 2922.
 - UPON COMPLETION OF THE VEGETATED SOIL FILTER MEDIA AND THE ESTABLISHMENT OF 90% CATCH OF GRASS OVER THE FILTER MEDIA, THE CONTRACTOR SHALL FLOOD THE VEGETATED BASIN TO THE SPILLWAY WITH CLEAR WATER AND ADJUST THE OUTFLOW TO OBTAIN A 24-HOUR TO 32-HOUR RELEASE TIME.
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 - INSPECTION OF SUBGRADE EXCAVATION (IF USED FOR SEDIMENT TRAP, INSPECTION AFTER RESHAPED)
 - INSPECTION OF LINER WHEN IN PLACE (PRIOR TO BACKFILL AND INSTALLATION OF FILTER MATERIALS)
 - AFTER FILTER MEDIA HAS BEEN INSTALLED AND SURFACE HAS BEEN SEED
 - AFTER ONE YEAR TO INSPECT VEGETATION UPTAKE AND OBSERVE FLOODING TEST IF CONDUCTED

TABLE 7-1
UNDERDRAIN SPECS.
MDOT #703.22

SIEVE SIZE	% BY WEIGHT
UNDERDRAIN TYPE B	
1"	90-100
1/2"	75-100
#4	50-100
#20	15-60
#50	0-15
#200	0-5

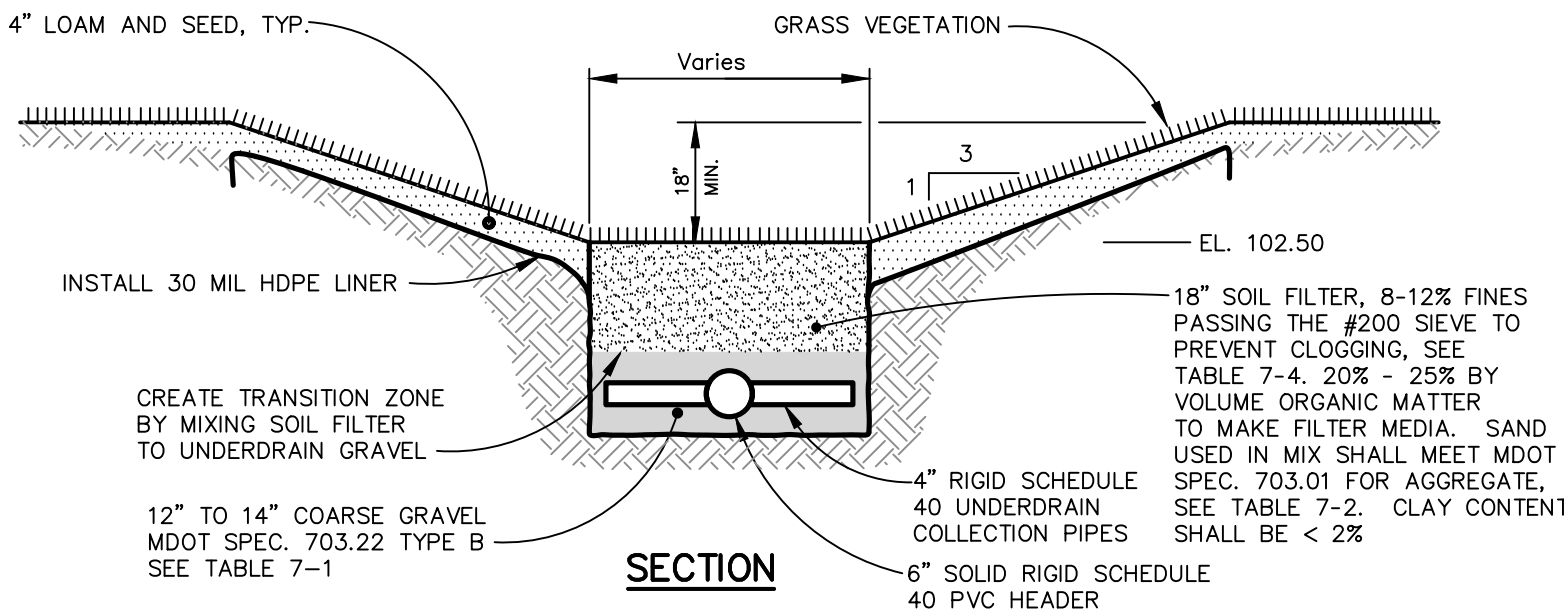
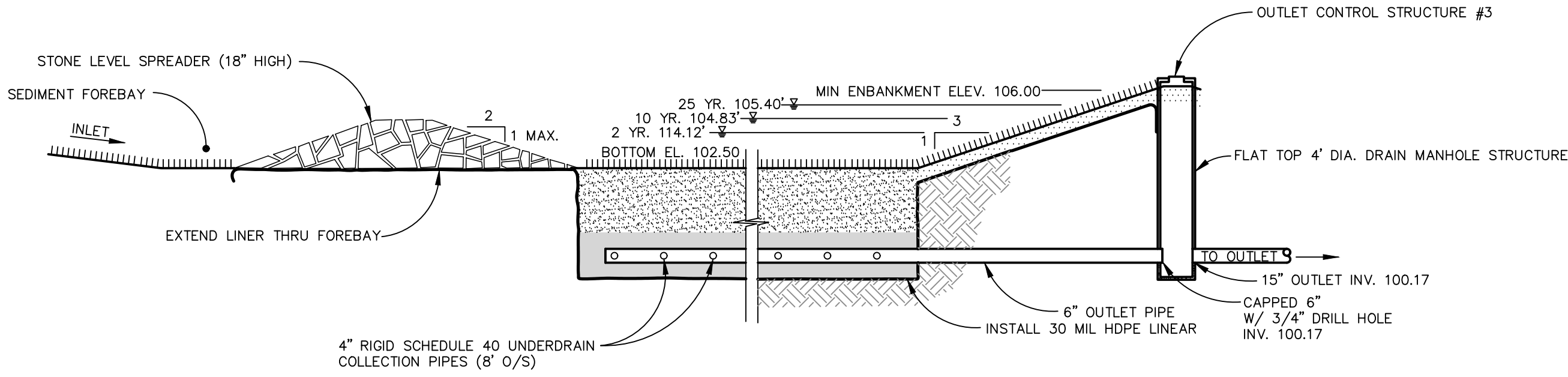
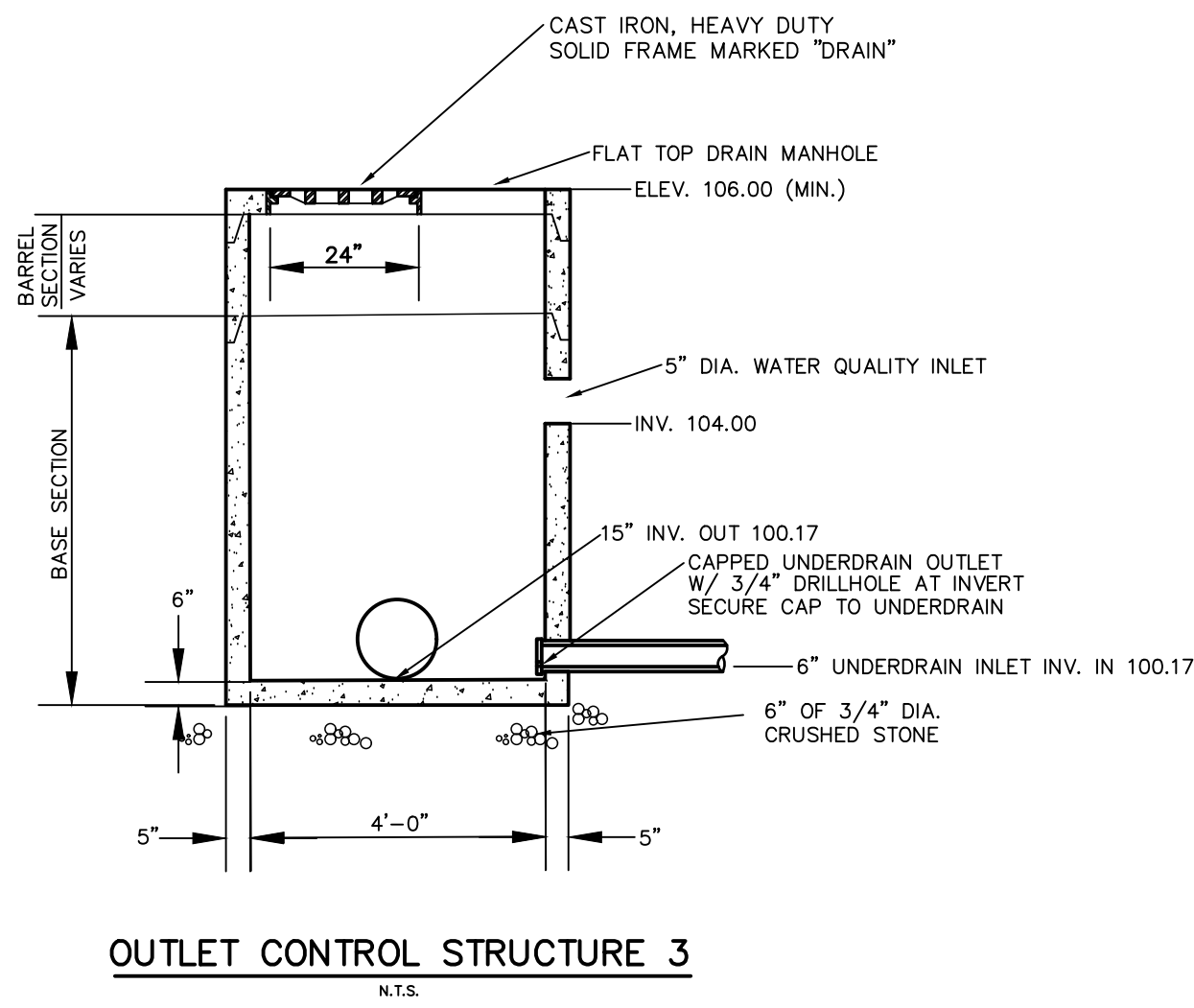
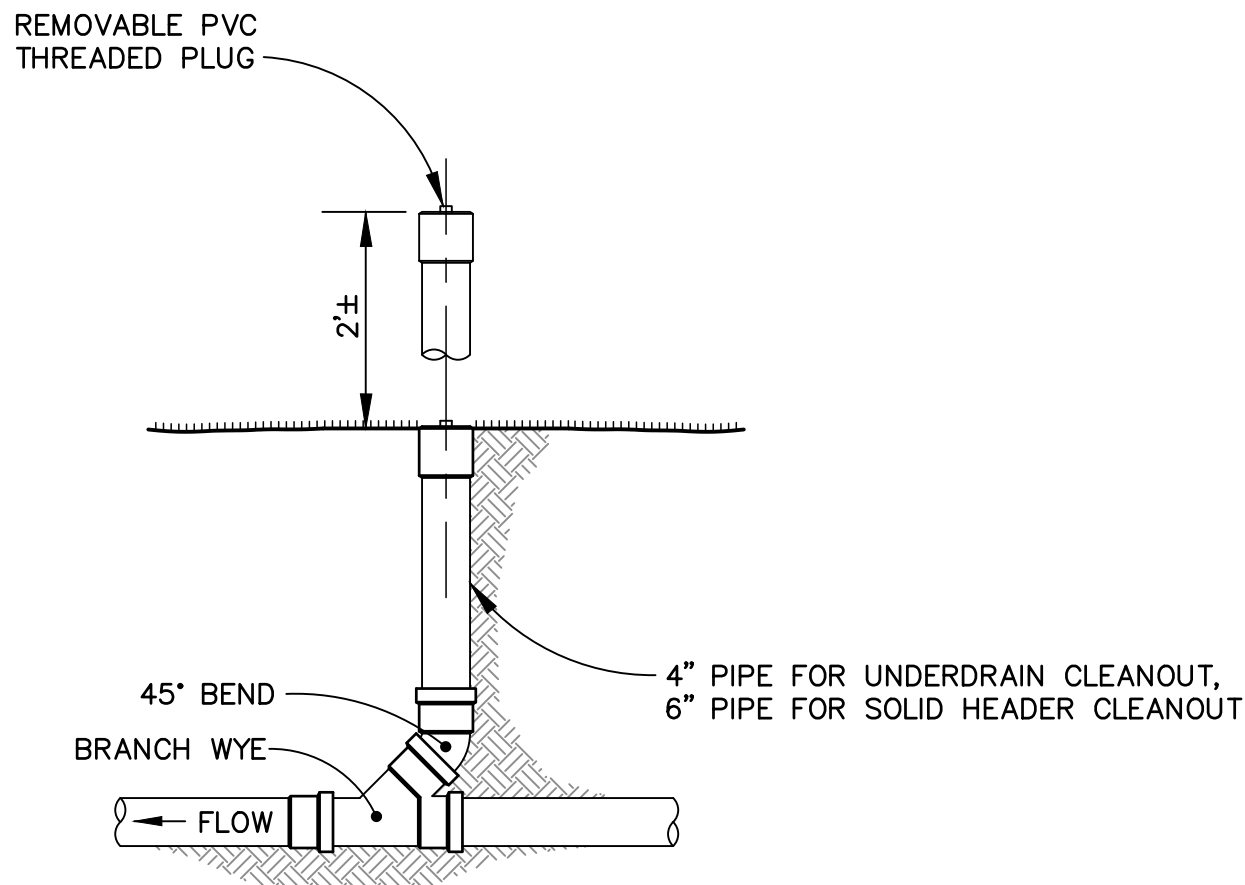
SIEVE SIZE	% BY WEIGHT
UNDERDRAIN TYPE C	
1"	100
3/4"	90-100
3/8"	0-25
#4	0-25
#10	0-5

TABLE 7-2
AGGREGATE SPECS.
MDOT #703.01

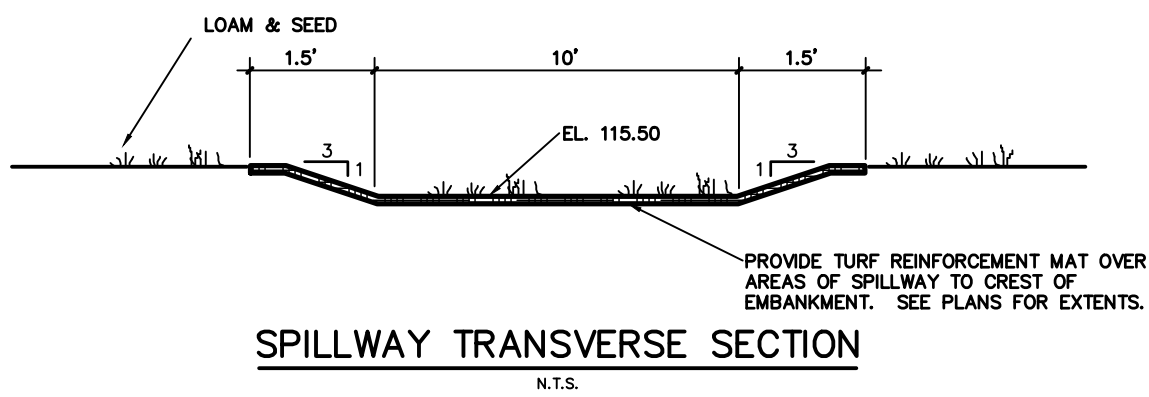
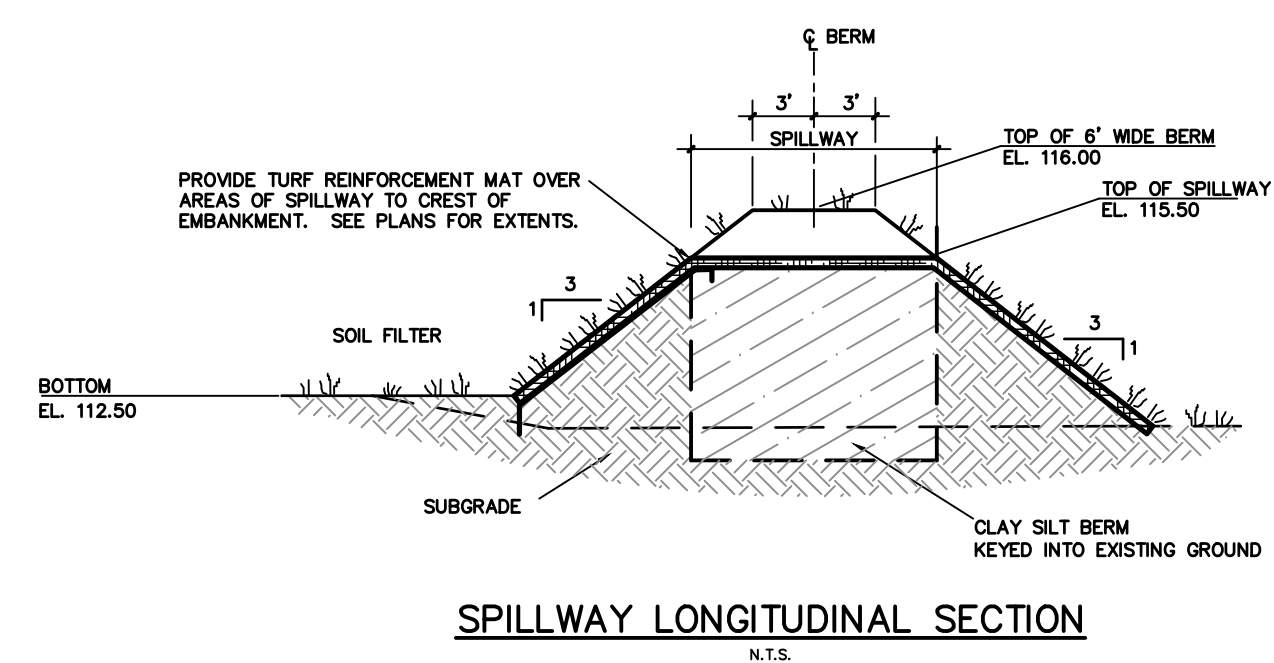
SIEVE SIZE	% BY WEIGHT
3/8"	100
#4	95-100
#8	85-100
#16	50-85
#30	25-60
#60	10-30
#100	2-10
#200	0-5

TABLE 7-4
COARSE LOAMY SAND SIEVE
ANALYSIS SPECIFICATION

SIEVE #	% PASSING BY WEIGHT
#10	85-100
#20	70-100
#50	15-40
#200	6-15

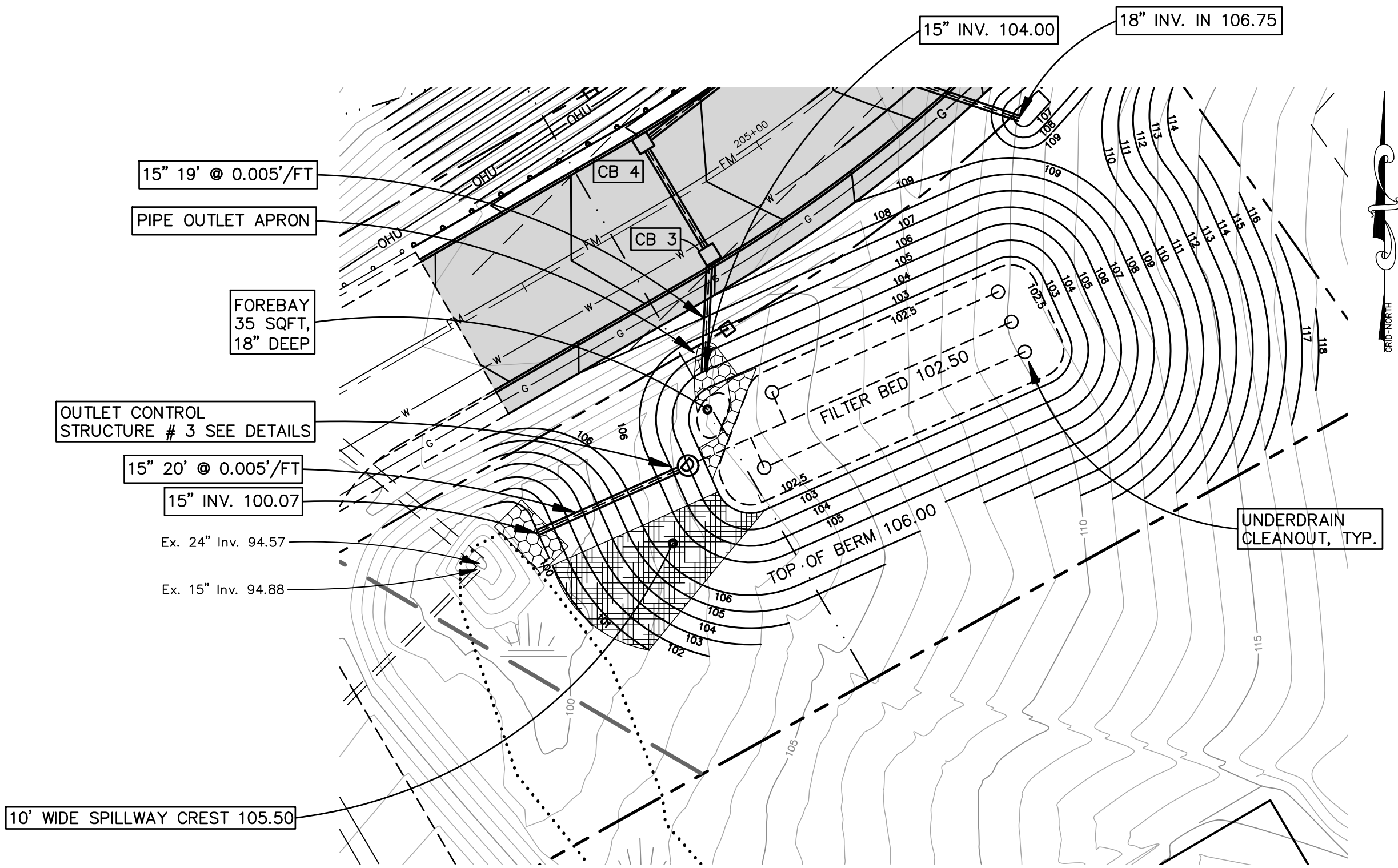


**GRASSED UNDERDRAIN
SOIL FILTER**
N.T.S.

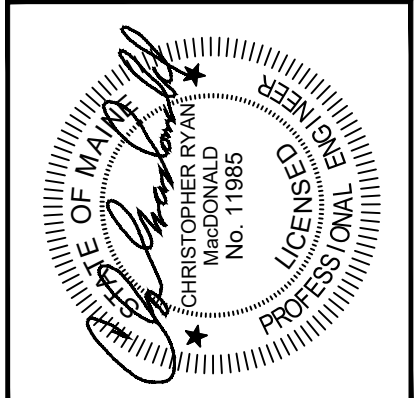


EMBANKMENT AND SPILLWAY DETAIL
N.T.S.

- DETENTION POND EMBANKMENT NOTES:**
- THE FOUNDATION AREA SHALL BE CLEARED OF TREES, LOGS, ROOTS BRUSH, BOULDERS, SOD, RUBBISH & TOPSOIL. THE ENGINEER SHALL OBSERVE & APPROVE THE EMBANKMENT SUBGRADE PRIOR TO PLACING ANY FILL TO DETERMINE SUITABILITY & POSSIBLE NEED FOR A CUTOFF TRENCH.
- FILL MATERIAL FOR THE EMBANKMENT SHALL CONSIST OF SILT AND/OR CLAY MATERIAL APPROVED BY THE ENGINEER. THE CONTRACTOR SHOULD NOTE THAT ACCEPTABLE MATERIAL MAY NOT BE FOUND ON-SITE. ALL FILL MATERIAL SHALL BE FREE OF SOD, ROOTS, FROZEN SOIL, STONES, GREATER THAN 6" IN DIA. & OTHER OBJECTIONABLE MATERIAL. ALL SNOW, ICE, OR FROZEN FILL SHALL BE REMOVED PRIOR TO ADDING ADDITIONAL FILL. FILLING SHALL COMMENCE IN THE LOWEST POINT OF THE CUTOFF TRENCH AND/OR DAM & CONTINUE IN HORIZONTAL LIFTS NO GREATER THAN 12". 92% MODIFIED PROCTOR DENSITIES SHALL BE OBTAINED IN EACH LIFT PRIOR TO ADDITIONAL LIFTS. THE DISTRIBUTION & GRADATION OF THE FILL SHALL BE SUCH THAT NO LENSES, POCKETS, STREAMS, OR LAYERS OF SUBSTANTIALLY DIFFERENT MATERIALS ARE PLACED IN THE LAYERS IN THE EMBANKMENT. FILL WITHIN 5' OF THE DISCHARGE PIPE & STRUCTURE SHALL BE COMPACTED TO 95% MODIFIED PROCTOR.



NO.	DATE	REVISION	DESCRIPTION
1	5/15/24		Submitted for Preliminary Permit Application
2	7/17/24		Submitted for Final Permit Application



BH2M

Berry, Huff, MacDonald, Milligan Inc.
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FOR

Indian Cliff Development Corp
260 Main Street
P.O. Box 444
Biddeford, Maine

**GRASSED UNDERDRAINED
SOIL FILTER 3 DETAILS**

BARRA ROAD SUBDIVISION

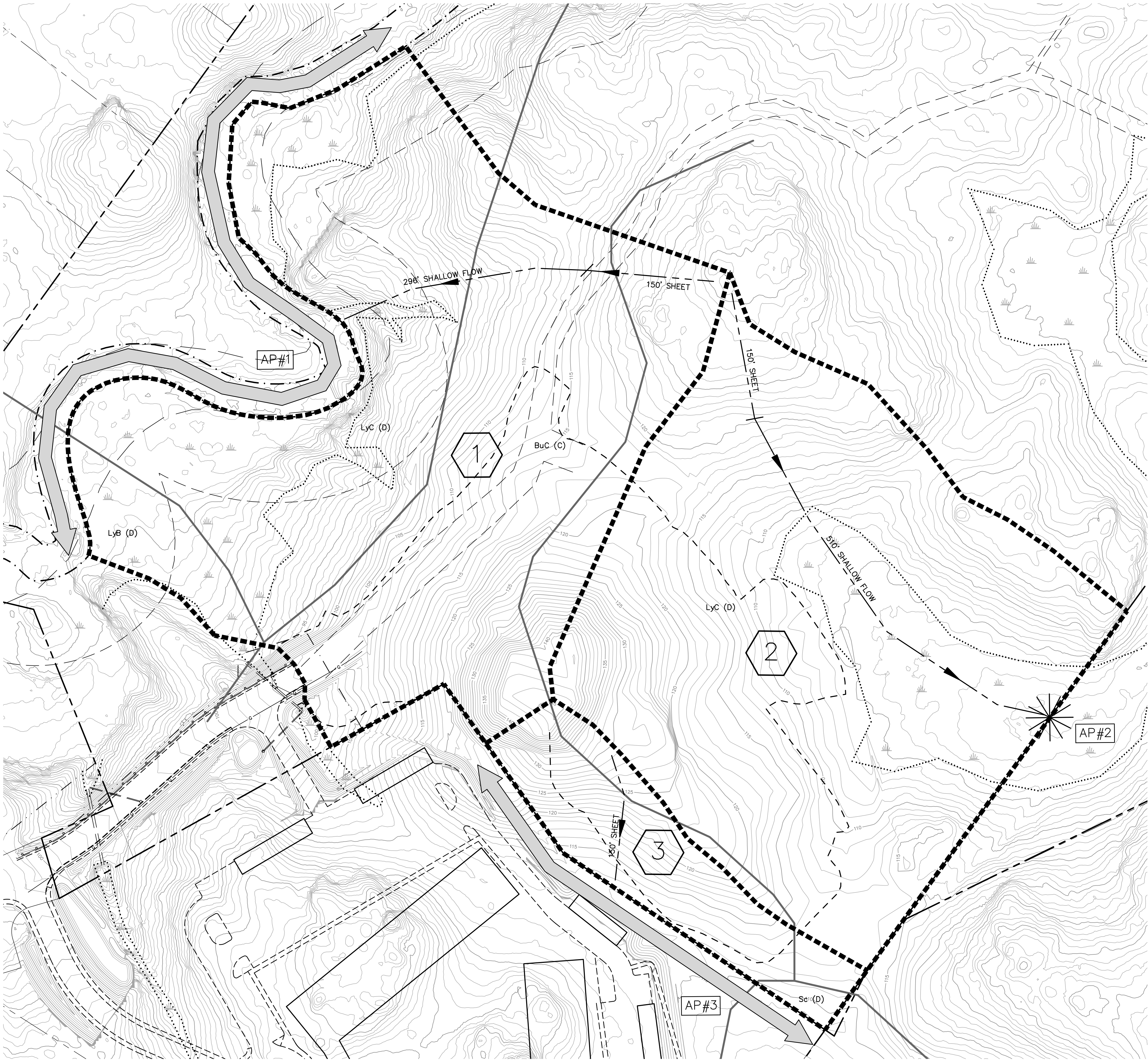
BARRA ROAD
BIDDEFORD, MAINE

DESIGNED C. MacDonald	DATE May 2024
DRAWN Staff	SCALE As Noted
CHECKED C. MacDonald	JOB. NO. 24017

SHEET

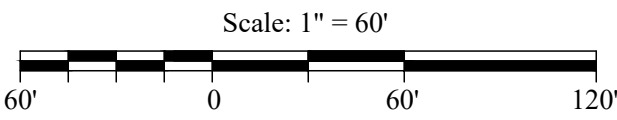
10

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SYMBOL	DESCRIPTION
	POND
	DRAINAGE SUB AREA
	REACH
	DRAINAGE AREA BOUNDARY
	TIME OF CONCENTRATION ROUTE
	LIMIT OF WETLANDS
	EXISTING CONTOUR
	PROPOSED CONTOUR

ANALYSIS POINT	PRE DEVELOPMENT FLOWS		
	2 YR. STORM	10 YR. STORM	25 YR. STORM
AP-1	7.20 CFS	15.25 CFS	22.36 CFS
AP-2	6.10 CFS	12.15 CFS	17.39 CFS
AP-3	1.00 CFS	2.23 CFS	3.32 CFS

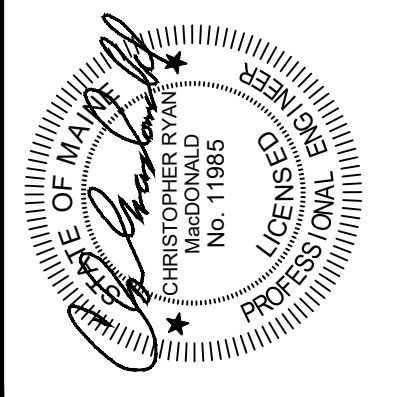


SOIL DESIGNATION	
AdB(A)	SLOPE DESIGNATION
AdB(A)	HYDROLOGIC SOIL GROUP
AdB(A)	HYDROLOGIC SOIL

SOILS LEGEND	
SYMBOL	DESCRIPTION
	SOIL BOUNDARY LINES
	LIMIT OF WETLANDS

HYDROLOGIC SOIL GROUP	
SOIL	GROUP
BUXTON (BuC)	C
LYMAN-ROCK (LyB)	D
LYMAN-ROCK (Lyc)	D
SCANTIC (Sc)	D

REVISION	
NO.	DATE
1	5/15/24
2	7/17/24



**BH2M**

Berry, Huff, McDonald, Milligan Inc.
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FOR

Indian Cliff Development Corp
260 Main Street
P.O. Box 444
Biddeford, Maine

PRE-DEVELOPMENT
PLAN

BARRA ROAD SUBDIVISION

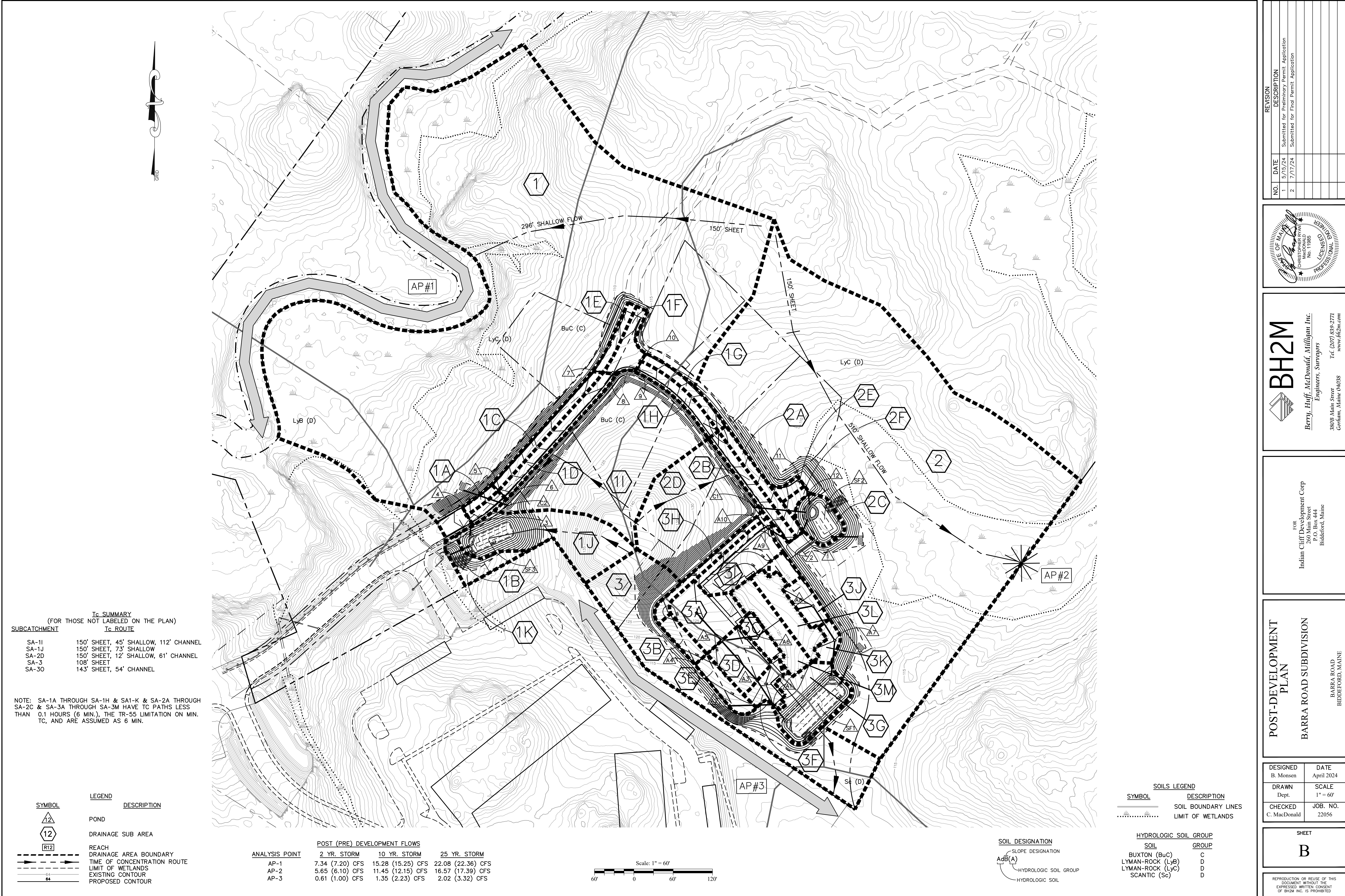
BARRA ROAD
BIDDEFORD, MAINE

DESIGNED B. Monsen	DATE April 2024
DRAWN Dept.	SCALE 1" = 60'
CHECKED C. MacDonald	JOB. NO. 24017

SHEET

A

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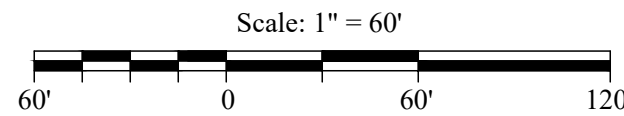
Tc SUMMARY
(FOR THOSE NOT LABELED ON THE PLAN)
SUBCATCHMENT Tc ROUTE

SA-1I	150' SHEET, 45' SHALLOW, 112' CHANNEL
SA-1J	150' SHEET, 73' SHALLOW
SA-2D	150' SHEET, 12' SHALLOW, 61' CHANNEL
SA-3	108' SHEET
SA-3O	143' SHEET, 54' CHANNEL

NOTE: SA-1A THROUGH SA-1H & SA-1K & SA-2A THROUGH SA-2C & SA-3A THROUGH SA-3M HAVE TC PATHS LESS THAN 0.1 HOURS (6 MIN.), THE TR-55 LIMITATION ON MIN. TC, AND ARE ASSUMED AS 6 MIN.

SYMBOL	DESCRIPTION
	POND
	DRAINAGE SUB AREA
	REACH
	DRAINAGE AREA BOUNDARY
	TIME OF CONCENTRATION ROUTE
	LIMIT OF WETLANDS
	EXISTING CONTOUR
	PROPOSED CONTOUR

ANALYSIS POINT	POST (PRE) DEVELOPMENT FLOWS		
	2 YR. STORM	10 YR. STORM	25 YR. STORM
AP-1	7.34 (7.20) CFS	15.28 (15.25) CFS	22.08 (22.36) CFS
AP-2	5.65 (6.10) CFS	11.45 (12.15) CFS	16.57 (17.39) CFS
AP-3	0.61 (1.00) CFS	1.35 (2.23) CFS	2.02 (3.32) CFS

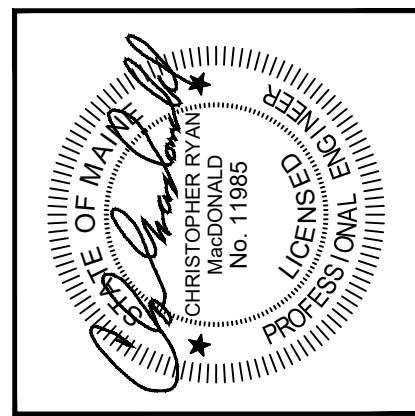


SOIL DESIGNATION
SLOPE DESIGNATION
AdB(A)
HYDROLOGIC SOIL GROUP
HYDROLOGIC SOIL

SOILS LEGEND	
SYMBOL	DESCRIPTION
	SOIL BOUNDARY LINES
	LIMIT OF WETLANDS

HYDROLOGIC SOIL GROUP	
SOIL	GROUP
BUXTON (BuC)	C
LYMAN-ROCK (LyB)	D
LYMAN-ROCK (LyC)	D
SCANTIC (Sc)	D

NO.	DATE	REVISION DESCRIPTION
1	5/15/24	Submitted for Preliminary Permit Application
2	7/17/24	Submitted for Final Permit Application



BH2M
Berry, Huff, MacDonald, Milligan Inc.
Engineers, Surveyors
380B Main Street
Gorham, Maine 04038
Tel: (207) 839-2771
www.bh2m.com

FOR
Indian Cliff Development Corp
260 Main Street
P.O. Box 444
Biddeford, Maine

POST-DEVELOPMENT
PLAN
BARRA ROAD SUBDIVISION
BARRA ROAD
BIDDEFORD, MAINE

DESIGNED B. Monsen	DATE April 2024
DRAWN Dept.	SCALE 1" = 60'
CHECKED C. MacDonald	JOB. NO. 22056

SHEET
B

REPRODUCTION OR REUSE OF THIS DOCUMENT WITHOUT THE EXPRESSED WRITTEN CONSENT OF BH2M INC. IS PROHIBITED.

REQUEST FOR CONSIDERATION AND APPLICATION FOR
CONTRACT ZONE
PURSUANT TO ARTICLE V, SECTION 9 OF
THE ZONING ORDINANCE OF
THE CITY OF BIDDEFORD

To: Biddeford City Council
c/o David Galbraith, Planner
City of Biddeford, Maine

Applicant: Indian Cliff Development Corp.
P. O. Box 444
Biddeford, ME 04005

Project Developer: Indian Cliff Development Corp.
P. O. Box 444
Biddeford, ME 04005

AVESTA Housing Development Corporation
307 Cumberland Avenue
Portland, ME 04101

Location of Property: Barra Road
Biddeford, Maine 04005 (the "Property")

Current Zoning: I-3 District & R-3 District

Proposed Zoning: Contract Zone #_____

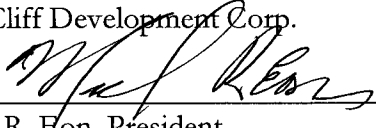
General Outline: The Applicant hereby makes application to the City of Biddeford for a zoning amendment pursuant to the Contract Zoning provisions contained in Article V, Section 9 of the Zoning Ordinance of the City of Biddeford. The Applicant is the owner of a parcel of land adjacent to and near the current terminus of Barra Road containing approximately 55.94 acres. Of that land, the Applicant and Project Developer wish to develop 7 acres, more or less, into 8 lots, one of which is to be developed by the Project Developer for 46 units of elderly affordable housing, 6 lots for single family/duplex housing and 1 lot to be non-buildable and to be dedicated to providing drainage and other infrastructure improvements. Currently the Property is undeveloped land to which public sewer and public water services are available as well as electrical and natural gas service, through extension from existing installations. The Project Developer intends to create approximately 46 units of elderly housing in one building. The residential units shall be single bedroom units. Density shall be no less than 1500 square feet per unit. There shall be a total of 35 parking spaces in the elderly affordable housing project which is .76 spaces for each unit of housing. The housing contemplated is intended to provide additional units of affordable housing in accordance with the Project Developer's organizational mission.

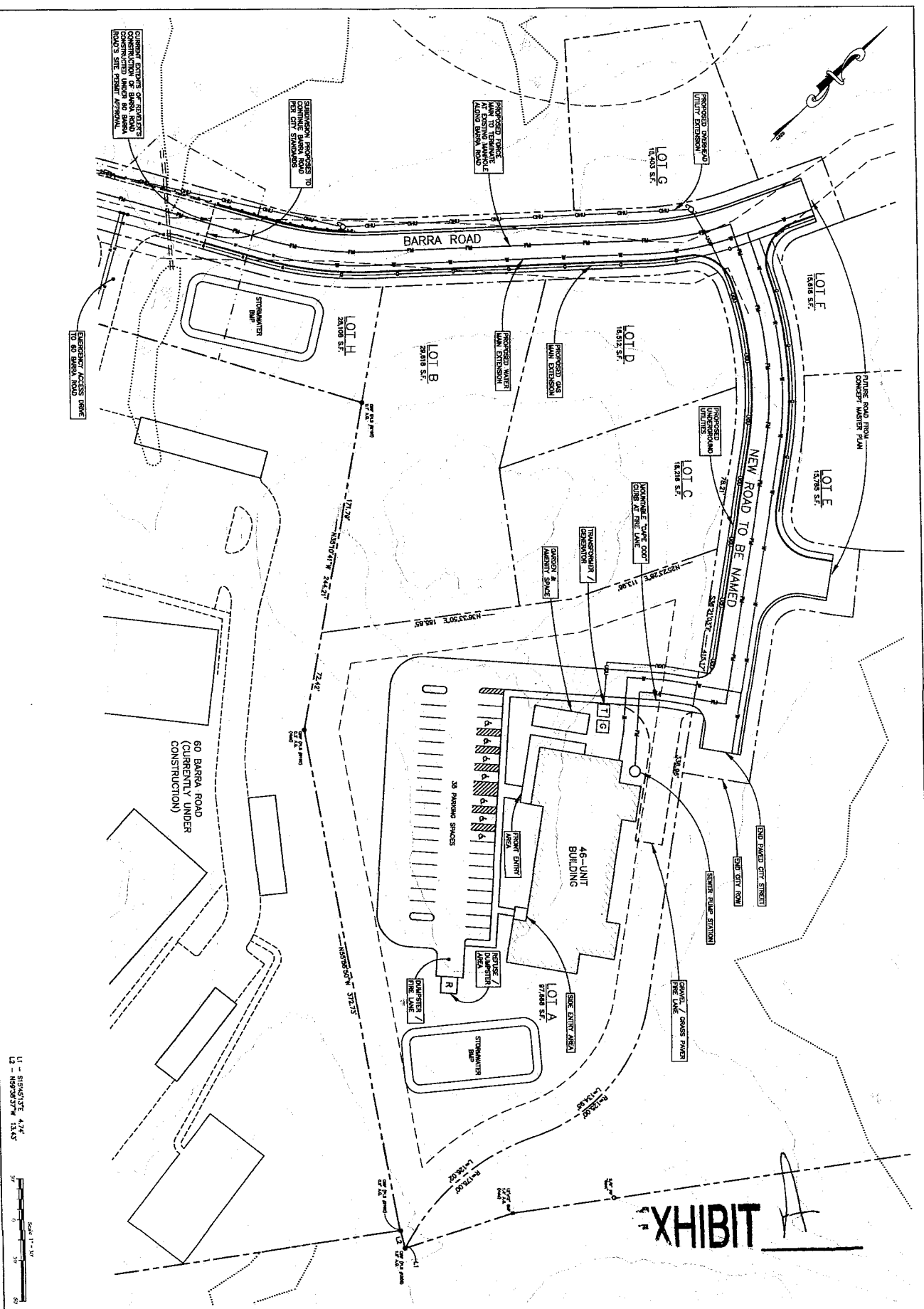
- A. Attached hereto as Exhibit A is a plan prepared entitled "CONCEPT PLAN, Avesta Biddeford, Barra Road, Biddeford, Maine" by BH2M Inc. dated March, 2024, which is a preliminary conceptual plan of the lot divisions planned by Applicants and improvements and parking planned by Project Developer. The requested Contract Zone applies to Lot A on said plan.
- B. The names and mailing address of the Applicant appears above. The primary contact person for this project is Michael R. Eon. His telephone number is 207-283-3000.
- C. Currently the property is located in the R-3 zone.
- D. As stated above, the property is currently unimproved. It is proposed to amend the current zoning ordinance on a contract basis to allow certain residential uses on the Property which are not currently not allowed. The Property is located in the R-3 zone and the intended use as residential housing is allowed in said zone. However, the minimum lot size in the R-3 zone is 15,000 square feet for the first 2 Units and 6000 square feet for each additional unit. The Applicant is requesting that the minimum lot size for this project be reduced to no less than 1500 square feet per unit as is allowed in the adjacent contract zone and height requirements will be no more than 60 feet as allowed in the adjacent zone. The front, side and rear minimum setbacks would be 25 feet and the minimum frontage would be 50 feet. The anticipated zone change is consistent with the City of Biddeford's Comprehensive Plan as the City has developed since the current Comprehensive Plan adopted in 1999, and the current discussions involving amendments to the Comprehensive plan. Biddeford has a greater percentage of persons renting housing instead of owning housing than other municipalities in the area. For this reason rental housing is to be encouraged. It is to be noted that the adjacent property is part of Contract Zone #18, which was created to allow the development of work force housing and that the proposed use is consistent with such adjacent use.

It is requested that the City Planner consult with the Code Enforcement Officer of the City of Biddeford and develop a recommendation for consideration at a regular City Council meeting. Following that, the Applicants look forward to the recommendation of the City Council that the Planning Board proceed with further review of the Project in order to develop a zoning contract.

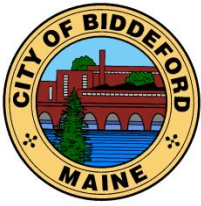
Dated at Biddeford, Maine this 29th day of March, 2024.

Indian Cliff Development Corp.

By: 
Michael R. Eon, President



DESIGNED C. MacDonald DRAWN C. MacDonald SHEET ORDERED C. MacDonald		DATE	CONCEPT SITE PLAN AVESTA BIDDEFORD BARRA ROAD BIDDEFORD, MAINE		FOR Avesta Housing 307 Cumberland Avenue Portland, Maine 04101	 BH2M <u>Berry, Huff, McDonald, Milligan Inc.</u> Engineers, Surveyors 2605 Maine Street Portland, Maine 04103 Tel: (207) 638-3371 www.bh2m.com	REVISION NO. DATE DESCRIPTION	
		SCALE						
JOB NO. 1-1-97 SHEET 2011		DATE						



CITY OF BIDDEFORD

Planning and Development Department

David C.M. Galbraith
Deputy Director/City Planner
205 Main Street
P.O. Box 586
Biddeford, ME 04005
(207) 284-9115

David.Galbraith@biddefordmaine.org

PLANNING BOARD STAFF REPORT

TO: Chair Patoine and Members of the Biddeford Planning Board

FROM: David C.M. Galbraith, City Planner & Deputy Director of the Planning & Development Dept.

DATE: July 31, 2024

RE: **2024.18 Final Plan Application for AVESTA Housing to build a 46 unit low income housing project for the elderly and Contract Zone #23 Approval. Property is located at Barra Road (Tax Map 7, Lot 15) in the R-3 zone.**

MEETING DATE: August 7, 2024 at 6:00 PM

1. INTRODUCTION

This Application was last discussed before the Board on June 5, 2024 where it received Preliminary Plan approval. The Applicant, Avesta Housing is before the Planning Board for the final review by the Planning Board. The Applicant is being represented by Ryan Fecteau, Senior Officer of Policy and Planning for Avesta Housing and Christopher MacDonald, PE Civil Engineer of BH2M Engineering Consultants.

The proposed Avesta Housing project is a four story, 46 unit, low / moderate income (LMI), senior housing development. The subject property (Tax Map 7, Lot 15) is a proposed 2.2-acre property lot located to the east of Barra Road, immediately north of the 60 Barra Road project (Reveler, formerly Saxon), and is located in the R-3 zoning district.

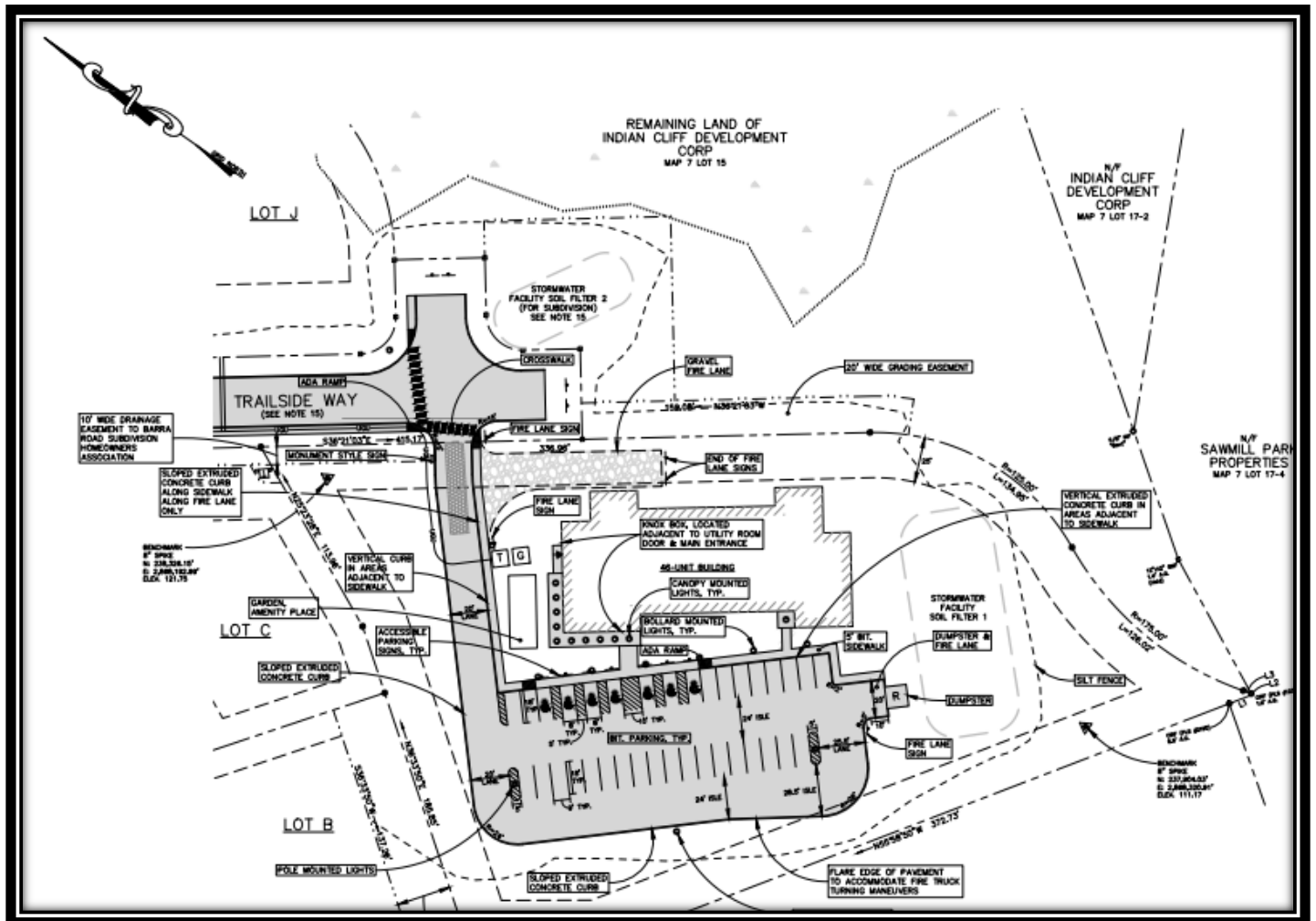
The project will be accessed via an extension of Barra Road to a new connecting roadway to be named Trailside Way. The proposed roadway name has been approved by the City's E-911 Addressing Officer who determined that the roadway name does not conflict with other street names in the City. In addition to site plan review and approval, the project will also require:

- A. A subdivision plan approval which is being reviewed concurrently with this application by Indian Cliff Development Corporation (property owner).
- B. Contract Zone # 23 review and approval. The proposed subdivision and Contract Zone have been applied for by the Indian Cliff Development Corp. which is owned, in part, by Michael Eon.

These projects / development reviews are being run concurrently and both are seeking Final Approval at the August 7, 2024 Planning Board meeting.

2024.18 Final Plan Application for AVESTA Housing to build a 46 unit low income housing project for the elderly and Contract Zone #23 Approval. Property is located at Barra Road (Tax Map 7, Lot 15) in the R-3 zone.

Planning Board Meeting Date: August 7, 2024

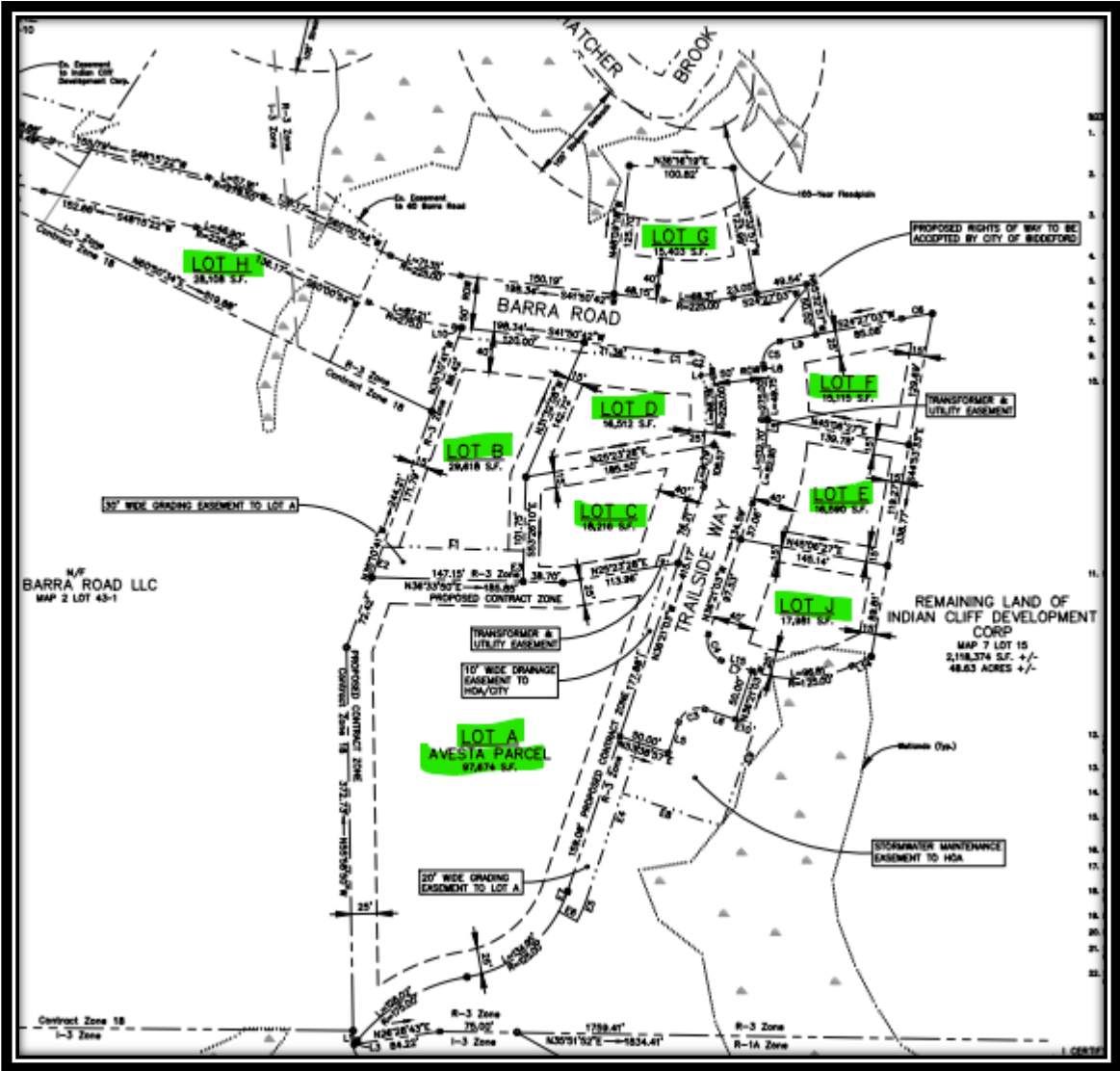


Avesta Housing – 46 Unit, LMI senior housing project

The Indian Cliff applications are being run parallel to the Avesta Site Plan Approval. As such the following process / approvals for the combined projects will require the following:

1. Avesta Housing – Site Plan: Final Site Plan approval.
2. Contract Zone # 23 – Planning Board recommendation for approval to the City Council for ultimate approval. A copy of the proposed Contract Zone # 23 is provided in the Planning Board review materials.
3. Indian Cliff Development – Final Subdivision approval.

2024.18 Final Plan Application for AVESTA Housing to build a 46 unit low income housing project for the elderly and Contract Zone #23 Approval. Property is located at Barra Road (Tax Map 7, Lot 15) in the R-3 zone.
Planning Board Meeting Date: August 7, 2024



Indian Cliff 9-Lot Subdivision

The subdivision project proposes to subdivide approximately 7 acres of the existing parcel to provide 9 new lots, with Lot A being the parcel proposed for Avesta’s development, Lots B through G being proposed as single family or duplex lots for Indian Cliff Development Corp, and Lot H being a remainder lot that is not proposed for housing development. Lot H currently features stormwater and access easements granted to Reveler for development of the 60 Barra Road project, which construction is currently ongoing, and will propose to provide stormwater management for the extension of Barra Road proposed by Indian Cliff Development.

2024.18 Final Plan Application for AVESTA Housing to build a 46 unit low income housing project for the elderly and Contract Zone #23 Approval. Property is located at Barra Road (Tax Map 7, Lot 15) in the R-3 zone.
Planning Board Meeting Date: August 7, 2024



Avesta Housing – South Elevation Front / Interior Elevation View



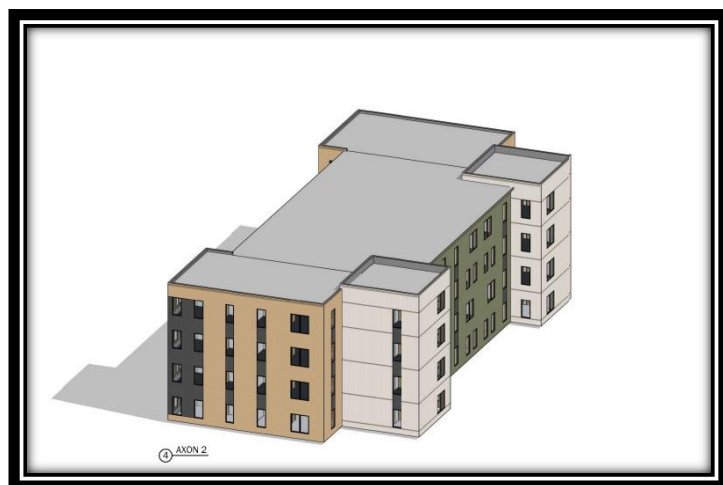
Avesta Housing – North Elevation - Roadway Elevation View

2024.18 Final Plan Application for AVESTA Housing to build a 46 unit low income housing project for the elderly and Contract Zone #23 Approval. Property is located at Barra Road (Tax Map 7, Lot 15) in the R-3 zone.

Planning Board Meeting Date: August 7, 2024



Massing Perspective – South Elevation



Massing Perspective – North Elevation

As the site plan, subdivision plan and Contract Zone are intertwined, Staff will be running these projects concurrently. The Applicants have submitted preliminary final subdivision plans and their proposed Contract Zone documents which will be discussed under the Indian Cliff Development application (Subdivision & Contract Zone).

2. PROJECT DATA/INFORMATION

1.	Applicant:	AVESTA Housing 307 Cumberland Avenue Portland, ME 04101
2.	Owner of Property:	Indian Cliff Development Corp
3.	Agent:	Christopher MacDonald P.E. BH2M 380B Maine Street Gorham, ME 04038
4.	Surveyor:	Same as above
5.	Project Location:	Barra Road
6.	Project Tax Map #/Lot #:	Tax Map 7, Lot 15
7.	Lot Size:	2.2 Acres
8.	Base Zoning:	R-3
9.	Overlay Zoning:	N/A
10.	Existing Use:	Vacant Land
11.	Proposed Use:	46 Unit Low Income Housing for Elderly
12.	Approvals Required:	Subdivision/Site Plan
13.	Uses in the Vicinity:	Commercial/Medical
14.	Waivers Needed:	a. Article VI, Section 26. F (slopes) b. Article XI .Article II.5.B.1.e.1 of the City Code, (exceeding pre-development stormwater run-off rates in post-development conditions)
18.	Waivers Granted:	a. None
22.	Other Non-City Permits Required:	
23.	LDR Attachment A: Fees Paid:	All Fees Paid

2024.18 Final Plan Application for AVESTA Housing to build a 46 unit low income housing project for the elderly and Contract Zone #23 Approval. Property is located at Barra Road (Tax Map 7, Lot 15) in the R-3 zone.

Planning Board Meeting Date: August 7, 2024

25.	Planning Board Review History: April 14, 2024- Sketch Plan; June 5, 2024- Preliminary; Final Plan Approval 8-7-2024.
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3. REVIEW PROCESS

Per City ordinance, this application is subject to Site Plan (Land Development Regulations, Article XI) review and Subdivision Review (Chapter 66 – Subdivisions) and approval by the Planning Board. The Application also includes a Contract Zone Approval Request (#23) which requires a positive recommendation from the Board to the City Council.

4. STAFF REVIEW

- **APPLICATION COMPLETENESS:** This application is for final plan approval so the purpose of this memorandum is to update the Board on the progress made to date and to provide direction to Staff and the Applicant regarding any missing items the Board would like to review as part of the Final Application review.
- **ZONING:** The subject property (Tax Map 7, Lot 15) is a proposed 2.2-acre property lot located to the east of Barra Road, immediately north of the 60 Barra Road project (Reveler, formerly Saxon), and is located in the R-3 zoning district. The Avesta project will require Site Plan approval, Subdivision Approval and Contract Zone Approval.
- **REVIEW STANDARDS:** In general, staff found the ~~preliminary~~ final plan application to satisfy City’s subdivision and site plan requirements.

WAIVER REQUESTS AND SAMPLE MOTIONS:

- A. Motion to Approve Waiver Request to Article VI, Section 26. F, for slopes greater than 3:1 and grading within 10’ of property lines.
- B. Motion to Approve Waiver Request to Article XI .Article II.5.B.1.e.1 of the City Code, exceeding pre-development stormwater run-off rates in post-development conditions.

5. STAFF RECOMMENDATION

City Staff has been working diligently with the Applicants to address technical and design related issues and are pleased to have this project in a final form that Staff supports. Staff is supportive of the Final plan proposal, the two waivers and Contract Zone #23 and recommends Approval of the project subject to the attached Findings of Fact (FOF) and Conditions of Approval (COA).

6. SAMPLE MOTION – CONTRACT ZONE:

- A. **Motion to Approve:** Motion to forward a positive recommendation to the City Council to approve Contract Zone # 23, as written.

7. SAMPLE MOTIONS – SITE PLAN REVIEW:

2024.18 Final Plan Application for AVESTA Housing to build a 46 unit low income housing project for the elderly and Contract Zone #23 Approval. Property is located at Barra Road (Tax Map 7, Lot 15) in the R-3 zone.

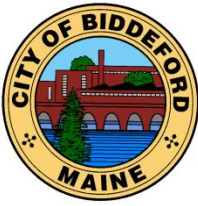
Planning Board Meeting Date: August 7, 2024

- A. **Motion to Approve:** Case # 2024.18 Final Plan Application for AVESTA Housing to build a 46 unit low income housing project for the elderly. Property is located at Barra Road (Tax Map 7, Lot 15) in the R-3 zone, Findings of Fact (FOF) and Conditions of Approval (COA) as written.
- B. **Motion to Table** Case # 2024.18 Final Plan Application for AVESTA Housing to build a 46 unit low income housing project for the elderly. Property is located at Barra Road (Tax Map 7, Lot 15) in the R-3 zone, based upon the following reasons:

- a) _____
- b) _____
- c) _____

- C. **Motion to Deny:** Case # 2024.18 Final Plan Application for AVESTA Housing to build a 46 unit low income housing project for the elderly. Property is located at Barra Road (Tax Map 7, Lot 15) in the R-3 zone, based upon the following reasons:

- a) _____
- b) _____
- c) _____



CITY OF BIDDEFORD

Planning and Development Department

David Galbraith
City Planner & Deputy Director of Planning &
Development
205 Main Street
P.O. Box 586
Biddeford, ME 04005
(207) 284-9115
David.galbraith@biddefordmaine.org

FINDINGS OF FACT AND CONCLUSIONS OF LAW

**Avesta Housing
Trailside Way/Barra Road
Site Plan/Subdivision Approval/Contract Zone #23
August 7, 2024**

RE: 2024.18 Final Plan Application for AVESTA Housing to build a 46 unit low income housing project for the elderly and Contract Zone #23 Approval. Property is located at Barra Road/Trailside Way (Tax Map 7, Lot 15) in the R-3 zone.

Pursuant to the provisions of the City of Biddeford Code of Ordinances Land Development Regulations, Article XI (Site Plan Review), and Article VI (Performance Standards), the Biddeford Planning Board has considered the application of Based on its review, including supportive data, public hearing testimony and related materials contained in the record, the Planning Board makes the following Findings of Fact and Conclusions of Law:

FINDINGS OF FACT:

	<i>SUBJECT</i>	<i>DATA/INFORMATION</i>
1.	Applicant:	AVESTA Housing 307 Cumberland Avenue Portland, ME 04101
2.	Owner of Property:	Indian Cliff Development
3.	Agent:	Christopher MacDonald P.E. BH2M 380B Main Street Gorham, ME 04038
4.	Engineer/Surveyor:	Same as Agent
5.	Project Location:	Barra Road/Trailside Way
6.	Project Tax Map #/Lot #:	Tax Map 7, Lot 15
7.	Existing Zoning:	R-3
8.	Overlay Zoning:	N/A
9.	Existing Use:	Vacant Land 2.2 acres
10.	Proposed Use:	46 Unit Low Income Housing for the Elderly
11.	Approvals Required:	Subdivision/Site Plan
12.	Uses in the Vicinity:	Commercial/Medical
13.	Parcel Size:	2.2 acres
14.	Limits of Disturbance:	2± acres
15.	Drainage Watershed:	Thatcher Brook

FINDINGS OF FACT AND CONCLUSIONS OF LAW
AVESTA Housing
Trailside Way/Barra Road
Site Plan/Subdivision Approval/Contract Zone #23
August 7, 2024

16.	Water Supply:	Maine Water
17.	Sewerage Disposal:	Public Sewer
18.	Solid Waste Disposal:	Private Hauler
19.	Fire Protection:	City of Biddeford
20.	Other Non-City Permits Required:	Maine DEP Stormwater
21.	Waivers Needed:	A. Waiver Request to Article VI, Section 26. F, for slopes greater than 3:1 and grading within 10' of property lines. B. Article XI .Article II.5.B.1.e.1 of the City Code, (exceeding pre-development stormwater run-off rates in post-development conditions)
	Waivers Granted:	A. Waiver Request to Article VI, Section 26. F, for slopes greater than 3:1 and grading within 10' of property lines. B. Article XI .Article II.5.B.1.e.1 of the City Code, (exceeding pre-development stormwater run-off rates in post-development conditions)
	LDR Attachment A: Fess Paid:	All Fees Paid

CONCLUSIONS OF LAW:

1. The proposed use meets specific requirements set forth in this ordinance and would be in compliance with applicable state or federal laws;
2. The proposed use would not create fire safety hazards by providing adequate access to the site, or to the buildings on the site, for emergency vehicles and would not create hazards through the storage of chemicals and wastes;
3. The proposed exterior lighting, where allowed, would not create hazards to motorists traveling on adjacent public streets or is adequate for the safety of occupants or users of the site or would not damage the value and diminish the usability of adjacent properties;
4. The provisions for buffers and on-site landscaping provide adequate protection to neighboring properties from detrimental or unsightly features of the development;

FINDINGS OF FACT AND CONCLUSIONS OF LAW
AVESTA Housing
Trailside Way/Barra Road
Site Plan/Subdivision Approval/Contract Zone #23
August 7, 2024

5. The proposed use would not have a significant, detrimental effect on the use and peaceful enjoyment of abutting property as the result of noise, vibrations, fumes, odor, dust, glare, hours of operation, or other causes;
6. The provisions for vehicular loading and unloading and parking and for vehicular and pedestrian circulation on the site and onto adjacent public streets would not create hazards to public safety or traffic congestion;
7. The proposed use would generate a volume of traffic that can reasonably be accommodated by the existing road network, or would not create unreasonable traffic hazards or would not exacerbate an existing traffic hazard, or would not create unreasonable traffic congestion;
8. The proposed use would not have a significant, detrimental effect on the value of adjacent properties which could be avoided by reasonable modification of the proposal;
9. The proposed use would not have an adverse impact on the privacy of the residents of the immediate area (within 500 feet) which could be avoided by reasonable modification of the proposal;
10. The proposed use would be in compliance with Biddeford's Comprehensive Plan;
11. The proposed use would not have an adverse impact on the immediate neighborhood or the community relative to architectural design, scale, bulk and building height, identity and historical character, or visual integrity, which could be avoided by reasonable modification of the proposal;
12. The design of the site would not result in significant flood hazards or flood damage or would be in conformance with applicable flood hazard protection requirements;
13. Adequate provision has been made for disposal of wastewater or solid waste or for the prevention of ground or surface water contamination;
14. Adequate provision has been made to control erosion or sedimentation;
15. Adequate provision has been made to handle stormwater runoff or other drainage problems on the site; and the proposed development will not unduly burden off-site surface water systems;
16. The proposed water supply would meet the demands of the proposed use for fire protection purposes;
17. Adequate provision has been made for the transportation, storage, and disposal of hazardous substances and materials as defined by state law;

FINDINGS OF FACT AND CONCLUSIONS OF LAW
AVESTA Housing
Trailside Way/Barra Road
Site Plan/Subdivision Approval/Contract Zone #23
August 7, 2024

18. The proposed use would not have an adverse impact on scenic vistas or on significant wildlife habitat or wetland areas and water bodies which could be avoided by reasonable modification of the proposal;
19. When located in the Shoreland Zone, the proposed use would meet the purposes of Shoreland Zoning as identified in Article XIV, Section 1 (Purposes) of this ordinance.

APPROVAL GRANTED:

Based on the evidence available and the conclusions above, the Biddeford Planning Board approves the proposed project summarized within the attached Staff report and pursuant to the provisions of the City of Biddeford Code of Ordinances Land Development Regulations, Article XI (Site Plan Review), and Article VI (Performance Standards), the Biddeford Planning Board has approved the application of Final Site Plan and Subdivision review for a proposed 46 unit affordable housing project for AVESTA Housing at Barra Road/Trailside Way (Tax Map 7, Lot 15) the recommended Findings of Fact (FOF) with the following Conditions of Approval (COA):

1. The material provided for the proposed project has been reviewed only for general conformance to the City technical requirements. The applicant(s) and/or their technical consultant shall be responsible for the actual design details and completeness of their work. It is incumbent upon the applicant(s) to ensure that the project is in conformance and complies with all City Codes, ordinances and regulations as well as with all state regulations, including, but not limited to, space and bulk standards, performance standards, use standard and other zoning type requirements.
2. All work shall be in conformance with the approved plans and submission documents. No deviations from the approved plans are permitted without prior approval from the Planning Board for major changes, and from the City Planner and City Engineer for minor changes. The City Planner shall make the determination of major or minor.
3. A Letter of Credit or other surety acceptable to the City of Biddeford shall be submitted prior to the issuance of permits or site work being initiated. The financial guarantee shall be established for 150% of the cost of the following improvements:
 - a. Landscaping
 - b. Paving
 - c. Work within ROW (existing or proposed)
 - d. Stormwater Drainage
 - e. Loam & Seed
 - f. Sediment & erosion control
 - g. As-Built Plans
 - h. Property Monuments

FINDINGS OF FACT AND CONCLUSIONS OF LAW
AVESTA Housing
Trailside Way/Barra Road
Site Plan/Subdivision Approval/Contract Zone #23
August 7, 2024

4. Prior to any ground disturbance, the applicant shall establish a construction inspection Account equal to \$2,500.00.
5. Prior to any ground disturbance, a pre-construction meeting with the owner/applicant, contractor, and City is required. Contact the Planning Department to get the information to schedule this meeting.
6. Contact the Department of Public Works for driveway location permits, curb cut permits and/or street opening permits prior to the start of construction.
7. An as-built plan must be provided to the City of Biddeford Engineering Office at the end of the project electronically, which can be read by the City of Biddeford's Geographic Information System software. Note: Any modifications to the Planning Board approved development plans shall be reviewed and approved by the Planner prior to being made, including any "field changes."
8. The applicant shall incorporate appropriate erosion control measures into this project to reduce erosion affects from the work. All disturbed areas must be re-vegetated and/or otherwise stabilized at the appropriate stage of the work per Maine DEP standards in the Best Management Practice (BMP) manual.
9. That the Article VI Performance requirements regarding Dust, Fumes, Vapors & Gases (sect. 25), Explosive Materials (sect. 28), Glare (sect. 37), Noise (sect. 48) be followed.
10. The applicant shall obtain all other pertinent local, state and federal permits, licenses, and Insurance such as blasting, building, electrical, plumbing, etc. prior to commencing business.
11. At the completion of the project the owner/applicant shall request a final inspection. This request shall be directed to the Planning Office. Performance guarantees and remaining escrow accounts shall not be released until the Planning Office certifies that the project has been completed and is in compliance with the approval and all applicable City Ordinances.
12. The applicant shall submit approved plans for signature of the City's Planning Board, which shall be recorded in the York County Registry of Deeds. An electronic copy of the recorded plan shall be sent to the Planning Office.
13. All conditions of approval previously adopted for the property are hereby affirmed.
14. Prior to the issuance of a Building Permit the Applicant shall pay a one-time fee of \$10,975.00 for the Thatcher Brook Impact Fee as outlined below:

FINDINGS OF FACT AND CONCLUSIONS OF LAW
AVESTA Housing
Trailside Way/Barra Road
Site Plan/Subdivision Approval/Contract Zone #23
August 7, 2024

CFUP Fee Schedule – Avesta Site Project			
Type of Surface	Compensation Fee (per acre)	Proposed Area (acres)	Compensation Fee
Non-roof Impervious Area	\$12,500	0.59	\$7,375
Roof	\$5,000	0.25	\$1,250
Landscape Area	\$2,500	0.94	\$2,350
Total			\$10,975

15. Curb-Opening Permit Fee: Prior to the issuance of a Building Permit the Applicant shall pay a curb-opening fee to be determined by the Engineering Department at building permit issuance.
16. Sewer Connection Fee: Prior to the issuance of a Building Permit the Applicant shall pay a sewer connection fee of \$77,433.20.
17. Prior to the development of the 46-unit low income housing facility the following fees shall be paid prior to the issuance of a building permit:
 - A. Curb-Opening Fee (Amt. to be determined by the Engineering Department.)
 - B. Sewer Connection Fee (Amt. to be determined by the Engineering Department)
 - C. Thatcher Brook/CFUP Fee, calculated for the proposed use utilizing the CFUP Fee Schedule as shown in Condition #14.
18. Prior to the scheduling of the required Pre-Construction meeting, the Applicant shall Make any required changes to the project's Civil Plans for the review of the Public Works Director.
19. This approval is valid through December 31, 2027. Building permits shall be issued and construction begun within this stipulated time period or the approval becomes invalid.

Larry Patoine Planning Board Chair

Date



City of Biddeford

Site Plan and Subdivision Final Application

AVESTA HOUSING PROJECT

Barra Road, Biddeford, Maine

July 2024

Applicant

Avesta Housing
307 Cumberland Avenue
Portland, ME 04101

Agent

BH2M
380B Main Street
Gorham, Maine 04038



Civil Engineering | Surveying

David Galbraith
City Planner of Biddeford, Maine
205 Main Street
P.O. Box 586
Biddeford, ME 04005

July 17, 2024

Re: Avesta Housing Biddeford
Final Site and Subdivision Submission

Dear David;

BH2M has been retained by Avesta Housing to provide Engineering, Surveying, and Permitting services for development of a 46-unit affordable elderly housing project proposed along the end of Barra Road in Biddeford. The project proposes to construct the 46-unit building, access, parking, sidewalks, stormwater and other amenities on a 2.2 acre parcel to be located on a proposed subdivision off the end of Barra road. The property for the Avesta project is being proposed in a subdivision by Indian Cliff Development, which is being applied for in parallel to these applications. Please see Indian Cliff Development's application for details of the Subdivision project proposed to create Lot A, where the Avesta development is proposed to be sited.

We had previously provided a Preliminary Site plan and Subdivision application for this project on May 15, 2024, and had a Preliminary approval for these applications at the June 5 Planning Board meeting. In advance of and following that meeting, we have received comments from City staff from Planning, Fire, Engineering and Department of Public works, as well as a 3rd party technical review of the plans and submissions. Based on these, we are providing a revised plan set and additional information for the City's review. Most changes between Preliminary and Final have been detailed in nature, with the same basic configuration of the proposed building and site improvements.

We have also had follow up conversations with Maine Water, having received an ability to service letter, and have made detail changes to the low pressure force main sewer system, providing updated detail calculations for this project and the subdivision which have been reviewed by the City Engineering department.

While reviewing the final details of the project, we understand that requests for waivers will be necessary based on the proposed details of the project. The project formally requests waivers for the following:

- Article XI .Article II.5.B.1.e.3 of the City Code, for slopes steeper than 2:1. The project proposes a slope of 2:1 for the southeastern corner of the parking lot to accommodate grading and along the west side of the parking lot where ledge is likely to be encountered.

For this western side, as we expect the majority of the cut to be in ledge, there may be an opportunity to provide steeper slopes and reduce impacts during construction.

- Article VI, Section 26. F, for slopes greater than 3:1. The project does propose 2:1 slopes as noted in the above waiver request. These slopes will either be in areas of ledge, or feature riprap final surface to prevent erosion. The project also proposes grading within 10' of the property line, with easements for grading where necessary.

In support of this project being reviewed for Final Approval, we are including the following attachments:

Attachment 1 – Updated Planning Department Drawing Checklist

Attachment 2 – Response to Preliminary Comments

Attachment 3 – Maine Water Ability to Service Letter

Attachment 4 - Updated Sewer Design Report

Attachment 5 – City Cost Estimate Worksheet

Attachment 6 – Updated Stormwater Management Report

We trust that these additional details will provide you with the necessary information to bring the Site Plan and Subdivision applications to the Planning Board for Final Approval. If you need any additional information, feel free to contact me directly.

Sincerely,



Christopher MacDonald, P.E.
Civil Engineer

Cc Ryan Fecteau – Avesta Housing
Todd Rothstein – Avesta Housing
Patraic Hodgson – Avesta Housing
Mike Eon – Indian Cliff Development Corp.



ATTACHMENT 1
UPDATED PLANNING DEPARTMENT DRAWING CHECKLIST



CITY OF BIDDEFORD - SITE PLAN APPLICATION DRAWING CHECKLIST

LAST REVISED: 04/18/23

CHECKLIST DIRECTIONS:

1. The following checklist must be completely filled out by the applicant for any Site Plan submittal to the Planning Department.
2. Applicant to confirm all of the items listed are included within the submittal. Any missing items must have adequate reasoning to justify their absence.
3. City to review applicant's submittal and checklist responses. Projects missing submittal information with non-acceptable reasoning will be rejected.
4. Items in **BLACK** are required for 'Preliminary Site Plan' approval & 'Final Site Plan' approval.
5. Items in **BLUE** are only required for 'Final Site Plan' approval.

SUBMITTAL INFORMATION - TO BE FILLED OUT BY APPLICANT	
Project Name:	Avesta Biddeford
Planning Board # (if available):	2024.18
Applicant Name/Info:	Avesta Housing
Submittal #/Type (Prelim/Final):	Final Site and Subdivision Applications
Submittal Date:	17-Jul-24

SUBMITTAL REQUIREMENT		APPLICANT RESPONSE		CITY REVIEW RESPONSE	
ITEM NUMBER	DESCRIPTION	INFORMATION PROVIDED (YES/NO)	REASON NOT PROVIDED/COMMENT	ACCEPTABLE (YES/NO-REVISE & RESUBMIT)	COMMENT
1	GENERAL PLAN REQUIREMENTS				
A	Drawing specific legends (linetypes, hatches, etc.)	Yes			
B	Individual drawing layer control should be utilized: freeze/thawing, changing lineweights, and screening (i.e. screen existing layers on a proposed plan, freeze topography and underground utilities on a proposed site plan)	Yes			
C	North arrows, standard engineering scale viewports, dated revision blocks	Yes			
D	All drawings and surveys must be in the following coordinate systems: NAD83 Maine State Plane West (Horizontal) and NAVD88 (Vertical)	Yes			
E	Drawings need to be designed, signed & sealed by a Maine licensed professional engineer (PE); all boundary survey data needs to be performed by a licensed professional land surveyor (PLS)	Yes			
2	COVER SHEET				
A	Project Name & Property Address	Yes			
B	Project Team Contact Information (Owner, Engineer, Contractor, etc.)	Yes			
C	Site Location Map	Yes			
D	Sheet Set List of Drawings	Yes			
E	Tax Map and Lot ID	Yes			
F	Zoning & Shoreland Zone Information	Yes			
G	Existing Use Description	Yes			
H	Proposed Use Description	Yes			
I	Required Waiver/Variances (Yes/No); if yes, plan must clearly list waivers/variances requesting	Yes	See cover letter for details on waivers being requested		
J	Name of Drainage Watershed	Yes	Thatcher Brook		
K	Within the MS4 Urbanized Area (Yes/No)	Yes			
L	Natural resources (streams, wetlands, etc.) located on-site or adjacent to the property (Yes/No)	Yes			
M	Within the 100-year Flood Zone (Yes/No)	No	Flood zone shown where applicable, project not in flood zone		
N	Public Road Proposed (Yes/No)	Yes			
O	Private Road Proposed (Yes/No)	No	No private ways proposed		
P	Public Sewer Connection (Yes/No); if yes, need to include a proposed sewer flow calculation per Maine's Subsurface Wastewater Disposal Rules, Chapter 241, Section 4 (Tables 4A & 4C)	Yes	Based on detailed analysis by City Engineering department		
Q	Public Storm Drain Connection (Yes/No)	No	No public storm drain connections proposed		
R	Limits of Disturbance in acres	Yes	Provided in Stormwater Report		
S	Pervious Land Cover square footage, existing and proposed	Yes	Provided in Stormwater Report		
T	Impervious Land Cover square footage (Pavement/Gravel), existing and proposed	Yes	Provided in Stormwater Report		
U	Building Roof square footage, existing and proposed	Yes	Provided in Stormwater Report		
V	Assigned Planning Board Number	Yes	2024.18 as provided during the sketch plan submission		
W	Estimated cut/fill earthwork volumes; if disturbing within Flood Zone, separate set of earthwork volumes required (site vs. within flood zone)	Yes	Reviewing an overall comparison of existing conditions and proposed conditions, we find that the project yields approximately 5225 cy of cut and 3420 cy of fill, or a net of 1805 cy of cut; not accounting for subbase materials or structual excavation for structures		
3	EXISTING CONDITIONS PLAN				
A	Horizontal & Vertical Datums annotated (NAD83 & NAVD88)	Yes			
B	Survey Benchmark Locations (with XYZ Coordinates annotated)	Yes			
C	Property & Right-of-Way Lines	Yes			
D	Boundary line information (bearings, distances, etc.)	Yes			
E	Property pin and monumentation locations	Yes			
F	Existing easements with proper ownership identified	Yes			
G	Road Names & Individual Lot Labels (Map, Lot, Owner, Acreage)	Yes			
H	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
I	100-year Flood Zone Limits & Elevation	Yes			
J	USDA-NRCS Soil Boundaries and Labels	Yes	Provided in Stormwater Report and Plans		
K	Existing contours with adequate contour labelling; minimum 1' contour interval	Yes			
L	Existing building FFEs annotated	No	No existing buildings on proposed project area		
M	Spot elevations for existing building corners, door entrances, accessible parking/walkways, road centerlines, and bottom/top of curbs	No	No existing buildings on proposed project area		
N	Existing buildings & structures	No	No existing buildings on proposed project area		
O	Existing pavement areas & number of parking spaces	No	No existing parking		
P	Existing ADA ramp geometry, detectable warning plates, and ADA parking spaces	No	No existing sidewalks		
Q	Existing site features (sidewalks, retaining walls, curbing, lightpoles, guide rails, dumpsters, fencing)	No	No existing site features		
R	Existing signage and striping	No	No existing roads		

S	Existing underground utility locations (storm, sewer, force main, water, gas, elec, tele)	No	All utilities are proposed by the accompanying subdivision project		
T	Existing above-ground utility locations (manholes, catch basins, utility poles, hydrants, transformers, riprap)	No	No existing utilities		
U	Rim, invert in, invert out, pipe size, cardinal direction (N, E, S, W) information for any existing utility infrastructure being tied into (upstream/downstream/outfalls)	No	No existing utilities		
V	Existing tree lines, street trees, free-standing trees (12" or larger diameter at breast height), and vegetation	Yes	Site fully wooded		
W	Location of any borings, drinking wells, and monitoring wells	Yes	Included in geotechnial report		
4	SITE DEMOLITION & EROSION CONTROL (E&SC) PLAN				
A	Limits-of-disturbance outlined and acreage annotated	Yes			
B	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
C	100-year Flood Zone Limits	Yes			
D	Callout existing site features to be demolished/removed/replaced	No	No existing structures or infrastructure		
E	Callout existing utilities to be demolished/removed/abandoned-in-place	No	No existing structures or infrastructure		
F	Hatch existing buildings and pavement to be removed	No	No existing structures or infrastructure		
G	Construction Entrance location(s)	Yes			
H	Perimeter E&SC control location(s) (i.e. silt fence, erosion berm mix)	Yes			
I	Stockpile and staging area(s) identified (with proper perimeter control)	Yes			
J	Inlet protection location(s)	Yes			
K	Note requiring contractor to implement dust control measures throughout construction	Yes			
L	Note requiring contractor to pave utility trenches within right-of-way within 3 days of excavation or prior to any rain event	Yes			
M	If groundwater expected, show dewatering/silt bag location(s); show temporary pumping routing				
N	If large development is proposed with an extensive underground stormwater conveyance network, show sediment trap/basin location(s) needed for constructability/phasing; provide sizing calculations				
5	SITE PLAN/SUBDIVISION PLAN				
A	Partial Site Plans needed for any viewport scale greater than 1"=20'	No	Plans provide appropriate detail at these drawing scales		
B	Existing property and right-of-way lines	Yes			
C	Proposed subdivision lot lines and labels	Yes			
D	Required Zoning Setbacks shown with dimensions and annotation	Yes			
E	Bulk requirement summary table (zoning/parking calculations)	Yes	Parking studies provdied in preliminary submission		
F	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
G	100-year Flood Zone Limits	Yes			
H	Proposed building outlines, door entrances and loading docks	Yes			
I	Proposed building labels	Yes			
J	Proposed road extents; provide clear annotation if roads will be public or private	Yes			
K	Proposed parking and accessible parking locations; annotate parking space counts	Yes			
L	Proposed signage, parking striping, and traffic striping	Yes			
M	Detailed ADA ramp geometry, detectable warning surfaces, and ADA parking striping/signage; existing & proposed	Yes			
N	Proposed site features (i.e. curbing, walls, fencing, guiderail, fire hydrant, transformers, light pole locations)	Yes			
O	Separate hatching for buildings, sidewalks, pavement, landscaping	Yes			
P	Proposed landscaping; detailed landscaping design should be on separate plans	Yes			
Q	Designated snow storage areas	Yes			
R	Proposed dumpster locations and trash removal access	Yes			
S	Linear dimensions of all drive aisles, sidewalk widths, parking spaces, loading docks	Yes			
T	Radial dimensions for all curbs, landscaped islands, sidewalks	Yes			
U	Road centerline stationing shown, labelled every 0+50' with curve data	No	Not Applicable, no roadways proposed		
V	If Private Road is proposed, final recorded plans must clearly note that proposed private roads will not be submitted in the future for public acceptance	No	Not Applicable, no private ways		
W	If Private Road is proposed, final recorded plans must clearly note that the City is not responsible for any maintenance, repair, plowing, or trash removal of proposed private roads	No	Not Applicable, no private ways		
X	Planning Board signature block for final recording	Yes			
6	GRADING PLAN				
A	Partial Grading Plans needed for any viewport greater than 1"=20'	No	1" = 30' Plans provided are at an appropriate scale for detail		
B	Limits-of-disturbance outlined and acreage annotated	Yes			
C	Proposed Building Labels with Individual Finished Floor Elevations (FFE)s	Yes			
D	Existing contours with adequate contour labelling, screened; minimum 1' contour interval	Yes			
E	Proposed contours with adequate contour labelling; minimum 1' contour interval	Yes			
F	Detailed grading for all ditches, swales, outfalls, and riprap	Yes			
G	All proposed contours tie-into existing contours at limits-of-disturbance outline	Yes			
H	Existing spot elevations for all asphalt and curb tie-in locations	No	Ties into proposed conditions for the Barra Road Subdivision, being jointly applied for		
I	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
J	100-year Flood Zone Limits	Yes	Proposed project does not impact flood zone limits associated with Thatcher Brook		
K	Proposed spot elevations for all important roadway geometric points and/or on a 50' maximum interval: low/high points, PC/PT, road centerline, edge-of-asphalt	Yes			
L	Proposed spot elevations for all curblines (bottom/top-of-curb) and sidewalks	Yes			
M	Proposed spot elevations for all parking and drive aisle geometry points	Yes			
N	Proposed spot elevations for all building corners and door-entry locations	Yes			
O	Proposed retaining wall/loading dock elevations (bottom/top of wall)	No	Not Applicable		
P	Proposed spot elevations for all ADA ramp/landing/parking stall geometry points	Yes			

	Q Proposed % slope arrows for all ADA parking spaces and sidewalks	Yes			
	R Proposed longitudinal % slope arrows for drainage ditch centerlines	Yes			
	S Proposed % slope arrows for roads, parking areas, and landscape tie-in areas	Yes			
	T Estimated cut/fill earthwork volumes; if disturbing within Flood Zone, separate set of earthwork volumes required (site vs. within flood zone)	Yes	Reviewing an overall comparison of existing conditions and proposed conditions, we find that the project yields approximately 5225 cy of cut and 3420 cy of fill, or a net of 1805 cy of cut; not accounting for subbase materials or structural excavation for structures		
7	ROAD PROFILES (if public/private road proposed)	No	Road not Proposed		
	A Existing surface; dashed and screened				
	B Proposed surface; continuous and bold				
	C Corresponding centerline stationing and curve data annotation				
	D Road cross-section including proposed surface cross slopes; include multiple sections for various road cross slope conditions proposed (crowned, superelevated)				
	E Horizontal and vertical scale bars				
	F Clear annotation if proposed road will be public or private				
	G If Private Road is proposed, plans must clearly note that proposed private roads will not be submitted in the future for public acceptance				
	H If Private Road is proposed, plans must clearly note that the City is not responsible for any maintenance, repair, plowing, or trash removal of proposed private roads				
8	UTILITY PLAN				
	A Existing underground utility locations; screened (storm, sewer, force main, water, gas, electric, telecom)	Yes			
	B Existing above-ground utility locations; screened (manholes, catch basins, utility poles, hydrants, riprap)	Yes			
	C Rim, invert in, invert out, pipe size, cardinal direction (N, E, S, W) information for any existing utility infrastructure being tied into (upstream/downstream/outfalls)	No	No existing structures or infrastructure		
	D Proposed underground utility locations; bold (storm, sewer, force main, water, gas, electric, telecom, lighting)	Yes			
	E Proposed above-ground utility locations; bold (manholes, catch basins, utility poles, hydrants, transformers, riprap)	Yes			
	F Proposed storm culverts, outfalls, and riprap locations and sizes	Yes			
	G Storm/sewer structure labels must include: rim, inverts in, inverts out, pipe sizes, cardinal directions (N, E, S, W)	Yes			
	H Storm/sewer pipe labels must include: linear footage, pipe size, material, slope	Yes			
	I Flow directional arrows for storm & sewer pipes	Yes			
	J Proposed & existing site features shown that could conflict with proposed utilities (trees, signs, lightpoles, bollards, foundations, guiderails)	Yes			
	K All storm drains must be sized to convey the 25-year storm	Yes			
	L Sewer force main sizes and invert elevations	Yes			
	M Sewer pump station locations, model, rim, inverts, pipe sizes, cardinal directions (N,E,S,W)	Yes			
	N Grease trap & oil-water separator locations, sizes, elevations	No	Not Applicable		
	O Water, gas, electric, and telecom sizes labelled	Yes			
9	UTILITY PROFILES	No	All gravity drain information shown on plans		
	A Utility profiles for all gravity storm drains and sewer pipes, including all laterals, catch basins, culverts, and outfalls; profiles preferred to be aligned on the pipe centerline (not superimposed on the road centerline)				
	B Existing surface; dashed and screened				
	C Proposed surface; continuous and bold				
	D Storm/sewer structure labels must include: rim, inverts in, inverts out, pipe sizes, cardinal directions (N, E, S, W)				
	E Storm/sewer pipe labels must include: linear footage, pipe size, material, slope				
	F Existing and proposed gravity pipe crossings shown; sizes labelled and depths/clearance annotated				
	G Existing and proposed electric/water/telecom/gas crossings shown at approximate depths; sizes labelled and depths/clearance annotated				
	H Known ledge or groundwater elevations				
	I For all storm drains, 25-year HGL must be shown on profiles with starting tailwater condition identified				
	J For storm outfalls, include riprap sizing and grading extents				
	K Horizontal and vertical scale bars				
10	DETAILS				
	A Road section detail, including pavement & gravel depths	Yes			
	B Sidewalk, paver, crosswalk, and any other pavement section details	Yes			
	C Pavement sawcut detail	Yes			
	D Utility trench/backfill detail	Yes			
	E All site feature details; curbing, retaining walls, fencing, guiderails, dumpsters, etc.	Yes			
	F Signage, striping, and ADA details	Yes			
	G E&S notes and details; only show applicable/proposed measures	Yes			
	H Utility structure details (manholes, cleanouts, fittings, handholes, transformer pads, hydrants)	Yes			
	I Storm outfall & riprap details	Yes			
	J Drainage ditch cross section identifying minimum depth, minimum bed width, and maximum side slopes	Yes			
	K Pump station, grease trap, and oil-water separator details	Yes			
	L Conduit section details	Yes			

M	Miscellaneous details (as needed)	Yes			
11	LANDSCAPING, LIGHTING & PHOTOMETRIC PLANS				
A	As required by ordinance; at a minimum: locations, counts, and species/models must be identified	Yes			
B	Landscaping & lighting details	Yes			
12	DOCUMENTS/REPORTS/CALCULATIONS				
A	On initial preliminary submittal applications, applicant must submit a development review and inspection fee. Applicant to coordinate fee amount with City Planner prior to submittal. This fee will be drawn against to cover the following type of services throughout the project life cycle (and may require replenishing): i. 3rd Party City Peer-Review ii. Site Inspections during the permitting process iii. Erosion & Sediment Control Inspections during construction iv. Right-of-Way Inspections during construction	Yes	Per Sketch plan application, Sketch Plan Application fees of \$12,915 and Preliminary Application fees \$8,355 have been previously paid, and Final Application fees of \$825 have been submitted with this application.		
B	Predevelopment & Post-development Drainage Area Maps, including: i. Subdrainage areas delineated and labeled ii. Points of Interest/Analysis shown and labeled iii. Hatching for different land cover areas (impervious, pervious, gravel) iv. Time of concentration (Tc) paths & durations v. Four City standardized stormwater summary tables	Yes			
C	An approved 'Sewer Ability-to-Serve Letter' from the Engineering Department: i. Applicant to submit proposed sewer flow calculations per Maine's Subsurface Wastewater Disposal Rules, Chapter 241, Section 4 (Tables 4A & 4C)	Yes	Provided in prelimiary application		
D	A Performance Guarantee Cost Estimate utilizing Planning's template	Yes	Provided as Attachment 5		
E	25-year hydraulic calculations for all storm conveyance piping (rational method), including starting tailwater conditions/documentation	Yes	See Stormwater Report		
F	If any SWM water quality BMP or detention facility is proposed, hydrologic model exports/hydrographs must be submitted for the for the 2, 10, 25, & 100-year storm frequencies	Yes	See Stormwater Report		
G	Sizing calculations for any SWM water quality BMP or detention facility	Yes	See Stormwater Report		
H	A stormwater maintenance manual for any proposed SWM water quality BMP or detention facility, including: i. Annual maintenance requirements ii. Annual inspection requirements by a licensed PE; noting that all inspection reports/logs need to be submitted to the Engineering Department by March 1st each following year, identifying what on-going maintenance has occurred and what remedial repairs are needed iii. Signed Property Owner Agreement: including the current property owner's contact information and signature; it must be noted that all stormwater BMP maintenance requirements are linked to the property for perpetuity and transfer to any new ownership	Yes	See Stormwater Report		
I	Salt Management Plan	Yes	Provided with preliminary application		
J	Sewer pump station sizing calculations	Yes			
K	Sewer pump station maintenance plan	No	To be provided for final application		
L	Grease trap sizing calculations	No	Not Applicable		
M	Homeowner Association (HOA) agreement for any private road serving two (2) lots or more	No	Not Applicable		
N	Summary list & copy of any required DOT/DEP/USACE permits & approvals	Yes	Project has applied for Maine DEP Stormwater Law Permit, copies provided to City		



ATTACHMENT 2
RESPONSE TO PRELIMINARY COMMENTS



July 17, 2024

David Galbraith
City Planner of Biddeford, Maine
205 Main Street
P.O. Box 586
Biddeford, ME 04005

Re: Avesta Housing Project
Barra Road – 64 Unit Housing Project Review Response to comments

Dear David,

We have reviewed the comments from the 3rd party review letter from Site Design Associates review, Biddeford City Planning Department review, and Biddeford Fire Department review for the Avesta Housing Project. Below we are providing responses to each of those comments:

Site Design Associates Tom Saucier comments Dated May 30, 2024

A. Drainage Plans and Calculations

1. Although the entire area of SC-3O (12,046 s.f.) is included in the model for the peak rates of runoff, and will be routed to SF-1, only 6,947 s.f. is included in the soil filter sizing calculations.

Response: The routing of these watersheds have changed, and SC-3O is no longer included in the model, however, the watershed that has replaced this, SC-2D, is now fully included in the soil filter calculations, with undeveloped vegetated areas included at a 50% reduction per Maine DEP Chapter 500.

2. The soil filter storage calculations appear to indicate that the filter material will have a 40% void ratio. Given the specifications for this material, that will not be the case.
Response: This has been revised to 20% void ratios in discussions with the City of Biddeford Engineering Staff.

3. The post-construction I and M plan narrative should include the requirements for inspecting the soil filter.

Response: The I&M plan does refer to requirements of inspecting the soil filter per section 1.6 of the plan, and as detailed in Appendix C of the plan. This plan has also been updated to include details of the City's inspection and reporting requirements to now include section 1.6 paragraph 5 to detail the City's inspection and reporting requirements, as well as have included the required form as Appendix F of the I&M plan.

B. Drawings

1. Sheet 1 – Site Plan

- a. Signage should be shown for the accessible spaces.

Response: These are now included in the plans.

- b. Site lighting should be shown on this drawing.

Response: Site lighting is now shown on the plans.

- c. A larger radius on the easterly side of the fire access should be considered.

Response: In discussions with the City Fire Department, we have made changes to the parking lot configuration to allow for a wider turning area to the east of the parking lot, flaring out the curb line to accommodate.

- d. Will Trailside Way be paved prior to the paving of this site?

Response: It is expected that Trailside Way will be paved prior to construction of this project.

2. Sheet 3 – Grading Plan

- a. What is the intent/purpose of note 3?

Response: Note 3 is included as required per the City's checklist. We believe the intent is to minimize erosion and sedimentation within existing areas of pavement if trenching is required.

- b. The plan for the soil filter indicates that stormwater will back up into the stormdrain lines from the soil filters, surcharging most of the drainage system. This has the potential to cause issues during winter months, and reducing the storm drain capacity during freeze thaw cycles, particularly with the slow drawdown of the soil filters.

Response: The outlet conditions for the close drainage system have been revised to accommodate a higher inlet level. This has been set to be at the water quality level to provide appropriate outlet conditions while maximizing the cover depth at CB A2, and set at the spillway elevation for other reaches of the drainage system.

- c. We recommend a level spreader at the end of the ditch below the soil filter outlet.

Response: A level spreader is now shown.

- d. Additional spot grades would be beneficial at the accessible parking spaces.

Response: We had shown spot grades at the 4 corners of the accessible spaces previously, and have added additional spot grades approximately in the middle of the accessible parking row to better demonstrate proposed grades.

- e. Slopes steeper than 3H:1V require additional erosion protection. This should be specified on the drawings and the extent shown. A waiver of Article XI .Article II.5.B.1.e.3. is required for slopes steeper than 2H:1V and of Article VI, Section 26. F. for slopes steeper than 3:1.

Response: Waivers have been requested, as the project does propose greater than 3:1 slopes. The steepest slope currently proposed is 2:1, but where there is likely significant ledge along the western side of the site, there may be an opportunity to have steeper slopes in areas of ledge cut.

3. Sheets 4 and 5 - Details

- a. Minimum 2 ft deep sumps should be provided in the Type F basins. Two courses of brick or equivalent grade rings should also be noted.

Response: F-type basins have been eliminate from the project.

- b. The pavement joint detail should include a shiplap joint.

Response: The pavement joint detail shows a 12" overlap shiplap joint between lifts of pavement, and is now noted as such.

- c. A typical section for the fire lane should be provided.

Response: A typical section for the gravel fire lane is now provided.

- d. We recommend hoods such as snouts or equivalent on catch basin outlet pipes.

Response: The project now shows a "Casco Trap".

4. Sheet 6 – Grassed Underdrained Soil Filter Details

- a. Provide embankment sections showing materials, compaction requirements, and relevant dimensions. Minimum embankment width should be 6 ft.

Response: Grading has been revised to include a 6' wide embankment.

- b. The inspection requirements for the soil filter construction should include inspections when the filter is excavated to subgrade, after it is reshaped if used as a sediment basin, and when the liner is in place prior to backfill.

Response: Inspection notes have been updated.

- c. What will prevent water from flowing through 20" of riprap in the emergency spillway? A better option for preventing erosion may be a Turf Reinforcement Mat.

Response: Turf Reinforcement Mat is now shown at the proposed spillway.

- d. The elevations for the various storms should be shown in the typical sections, along with the water quality volume.

Response: These elevations are now shown.

- e. Riprap aprons should be shown at the ends of the outlet control structure outlet pipes and inlet pipes to the soil filter.

Response: Riprap aprons are now shown.

- f. A detail of the forebay with dimensions should be provided

Response: Dimensions of the forebays are now provided.

City of Biddeford Planning Department comments Dated May 28, 2024

1. Final application plans shall include a plan detail of the refuse and recycling enclosure. The enclosure shall match the building materials and color palate.
Response: As discussed with the City Planning Department, the cedar fence proposed for the enclosure is a good match for the earth toned color palate of the proposed building. A stained cedar fence was found satisfactory.
2. The submitted Landscape plans consisted of six (6) Sea Green Junipers; three (3) Serviceberry trees; two (2) Columinar Red Maple trees; and one (1) Canadian Plumb tree with the balance of the property being a clover lawn. The proposed plantings seem minimal for a residential development and Staff encourages additional landscaping (trees, bushes, flowers, etc) to be included in the final application review.

The formal application plans shall include landscape plans which includes proposed plant species (Maine native species), installation sizes, number of plant species and species locations on a formal Landscape / Planting Plan.

Response: A revised planting plan was previously provided to planning for initial review. These changes were found to be satisfactory.

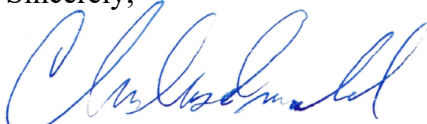
City of Biddeford Fire Department comments Dated May 15, 2024

1. The turning radius you applied in your plans shows the turn of the vehicle touching the parking curbs at each end of the middle parking area, along the back curb, and shows the truck driving over the painted area in front of the building. This is not acceptable. This does not allow any room for errant parking of the tenants where our operators will have to make adjustments based on their parking nor does it allow any consideration for snow buildup.
Response: Revisions to the parking layout are now shown on the revised plans. These make better accommodations for the larger City ladder truck by flaring out the southeastern curb line to provide a wider turning area for the ladder truck. A turning template has been provide to the City Fire Department for final review.
2. We will need a second Knox Box located at the main entrance.
Response: A second Knox Box is now proposed at the main entrance.

3. I did not see the hydrant location added to the building unless it's on another page that I missed.

Response: Based on our follow up conversations, an additional fire hydrant is now shown on the northern side of the parking lot, and the previously proposed hydrant was moved across the intersection with Trailside Way to allow for hookup without impacting access to Avesta's driveway.

Sincerely,



Christopher MacDonald, PE

Cc Ryan Fecteau – Avesta Housing
Todd Rothstein – Avesta Housing
Patraic Hodgson – Avesta Housing
Mike Eon – Indian Cliff Development Corp.



ATTACHMENT 3
MAINE WATER ABILITY TO SERVICE LETTER





June 7, 2024

ATTN: Christopher MacDonald, PE
BH2M
380B Main Street
Gorham, ME 04038

Re: Ability to Serve Determination – Avesta Housing - Barra Road, Biddeford

Greetings,

The Maine Water Company (MWC) has received your request on the behalf of your client, Avesta Housing, for an Ability to Serve Determination for the above-referenced project. The request specifies a plan to construct a 46-unit senior housing facility and associated utility infrastructure improvements. The expected domestic service demand is 4,622 gallons per day. The expected fire service demand is currently unknown.

Domestic water is available for your project from the existing 12-inch ductile iron main in the Barra Road Right-of-Way (ROW) to serve the project. A developer-proposed main extension to serve the Barra Road Subdivision is currently under review under a separate cover. Domestic service for the Avesta Housing development is planned to extend off the proposed main extension. Based on the criteria provided by the developer's agent, the expected increase in water usage is within the Biddeford Saco Division of MWC's available system capacity. The static pressure in the area is approximately **60 psi**. Additional infrastructure improvements may be required at the expense of the developer to meet the overall needs of this project.

Conditions of Service

- MWC has the understanding that fire service demand is unknown at this time, are not be included in this request, or accounted for in this Ability to Serve Determination.
- If fire service is required, ap hydrant flow test at the nearest available hydrant will need to be conducted and analyzed by the sprinkler designer to ensure that adequate flows can be met during a peak fire demand event.
- The developer is required to pay for the cost of any modification, renewal of impacted service lines, and retirement of unused or discontinued services to MWC standards of best practice.
- Additional plan approval, paperwork, and fees associated with this project will require proper coordination with MWC. MWC requires upfront payment for inspection and paperwork to be fully completed before any construction on waterworks materials.
- Service lines must comply with MWC Cross Connection Control Program.
- Allow up to 30 days for the MWC utility review process once final plans are ready to be completed before any construction on waterworks materials will be approved.

Should a request for service or completion of the project not be executed within one year of the date of this letter, MWC reserves the right to reevaluate its ability to serve this project.

All work must be completed in accordance with MWC Terms and Conditions as well as material specifications. All appropriate paperwork must be completed, and deposit paid prior to the start of construction. Please forward all design plan revisions as the project develops to prevent construction delays. Water service will be provided in accordance with Maine Public Utility Commission rules. If you have any additional questions, please do not hesitate to contact our office at 1-800-287-1643 or by email at Patrick.Gere@mainewater.com. We look forward to working with you throughout design and construction.

Sincerely,
The Maine Water Company

A handwritten signature in black ink, appearing to read "P. Gere".

Patrick Gere, PE
Project Engineer

ATTACHMENT 4
UPDATED SEWER DESIGN REPORT

Pressure System Design Report For

Barra Rd Single and Duplex Lots

Biddeford, ME

June 27, 2024



Christopher MacDonald, P.E.
Civil Engineer
BH2M
380B Main Street
Gorham, Maine 04038
207 839-2771 x 203

June 27, 2024

RE: Barra Rd, Biddeford ME Single and Duplex Lots

Dear Christopher;

This preliminary design analysis examines the use of the E/One Pressure Sewer System for your project. E/One has over 50 years of installation and O&M experience along with considerable research and development leading to continuous product and system improvements. E/One remains the worldwide industry standard and industry leader in the pressure sewer technology. The unique characteristics of the E/One Pressure Sewer approach provides not only a technical solution, but also an economic advantage to be realized with low up front and O&M costs.

System Analysis

Based on the proposed plan, we are showing forty six (46) unit elderly affordable housing apartment, and seven (7) duplex residential lots. All proposed lots will than connect to a manhole located on Barra Rd. We broke this into two (2) reports, one showing if the seven (7) lots remained single lots, and the other showing if the became duplex. We labeled said reports as "Barra Rd- Biddeford ME Single lots" and "Barra Rd- Biddeford ME Duplex lots"

Using the information you provided, we ran the enclosed preliminary pressure sewer pipe sizing analysis. This was run through our Low Pressure Sewer Design Software that employs our Flow Velocity and Friction Head Loss vs. Pumps in Simultaneous Operation Spreadsheet. We have used the surface topography provided to make our analyses.

Zone Layout

Using your site plan we laid out a system of two (2) flow Zones leading to the final discharge point. Zone one (1) is showing the affordable housing unit and Zone two (2) shows the seven (7) duplex residential lots. Zone one (1) will be a 2 inch HDPE FM and Zone two (2) will be a 3 inch HDPE FM. FM is sized for future connections. In both reports the zones remain the same, the only change is we go from seven (7) pumps in zone 2 to fourteen (14) pumps, pipe size remains the same.

Computations are based on the Hazen-Williams formula for friction loss, using

calculations of cross-sectional area and flow rate to determine pipe sizes that create "self-cleaning" velocities of 2.0 fps or higher. A "C" factor of 150, SDR HDPE pipe and the average expected daily volumes for single family homes are also used in this analysis.

The highest Total Dynamic Head generated is approximately 26 feet with single lots and 32 feet with duplex lots which is predominately head conditions when the pressure sewer pumps operate with the lift station operating. This is well below our pump's continuous-run rating of 185 ft, and well within its intermittent, i.e., normal, operating range. Flow velocity throughout the system meets or exceeds 2 fps these characteristics and low retention time indicate that this will be a reliable, low-maintenance system.

Design Flows & System Velocity

We have used the design flows you provided.

The ADF of 6,000 gpd and commercial use would suggest that we use the DH502 duplex pump station rated to 6,000 gpd. For the residential could be met with our DH071 simplex station rated to 700 gpd. Again, due to the commercial nature of the application we have selected the DH502 station as is shown in the budget portion of the report.

Appurtenances

Our normal recommendations for valve placement are as follows: flushing connections at 1,000' to 1,500' intervals and at branch ends and junctions; isolation valves at branch junctions; and air release valves at peaks of 25 ft or more and/or at intervals of 2,000 to 2,500 ft.

Common practice in pressure sewers requires the ability to isolate each lot with a corporation stop off the main and service lateral kit to the lot line. E/One has

developed a true wastewater rated check valve which is built in to our stainless steel lateral kit shown in this report. These components are rated to 235 psi and with standard connection fittings rated to 150 psi. These items are included in the budget analyses and shown in this report.

We strongly advise against the use of waterworks check valves as they are not rated for sewage environments. We do not like to recommend brass due to concerns for corrosion. **WEF Manual of Practice FD-12, Second Edition**, page 45 speaks to the limited success of brass or bronze alloys.

“Besides corrosion considerations, brass is subject to de-alloying, while some bronze, such as 85-5-5, will give better performance. The terms *brass* and *bronze* are used loosely, despite having different meanings; the engineer is advised to evaluate these materials with caution.”

We have also seen PVC body check valves with pressure rating to 150 psi that do not have the same rating for back pressure on the check valve. This can result in damage to the check valve and pumping issues as the check valve disc can become dislodged under pressure and then become a line obstruction. Connections to the main pressure line do not require WYE type fittings. We commonly use a TEE or saddle connection. We isolate each connection to the main line with a stainless steel corporation valve in the same manner used for other utilities such as gas and water services.

System Monitoring

We also include in this package information regarding the Sentry monitoring system for Environment One stations. This system allows the owners to monitor run times, pump starts and stops and running conditions such as amp draw, etc. This system can be monitored from a secure web access and will provide the ability to pre-empt service issues before they become emergencies.

Budget Notes

We can formally quote this when the project comes closer.

\



water supply and pollution control equipment



273 Weymouth Street, Rockland, MA 02370
tel. 781-982-9300 • fax. 781-982-1056
www.frmahony.com • www.amphidrome.com
info@frmahony.com

Costs of pipeline excavation and pump installation are best obtained from sources in your region. You may be better able to determine these costs. I am looking forward to working with you on this and future projects. Please contact me if you have any questions or require additional information.

Best regards,

Daryl Coppola

Outside Sales Engineer

781-820-5808

dcoppola@frmahony.com

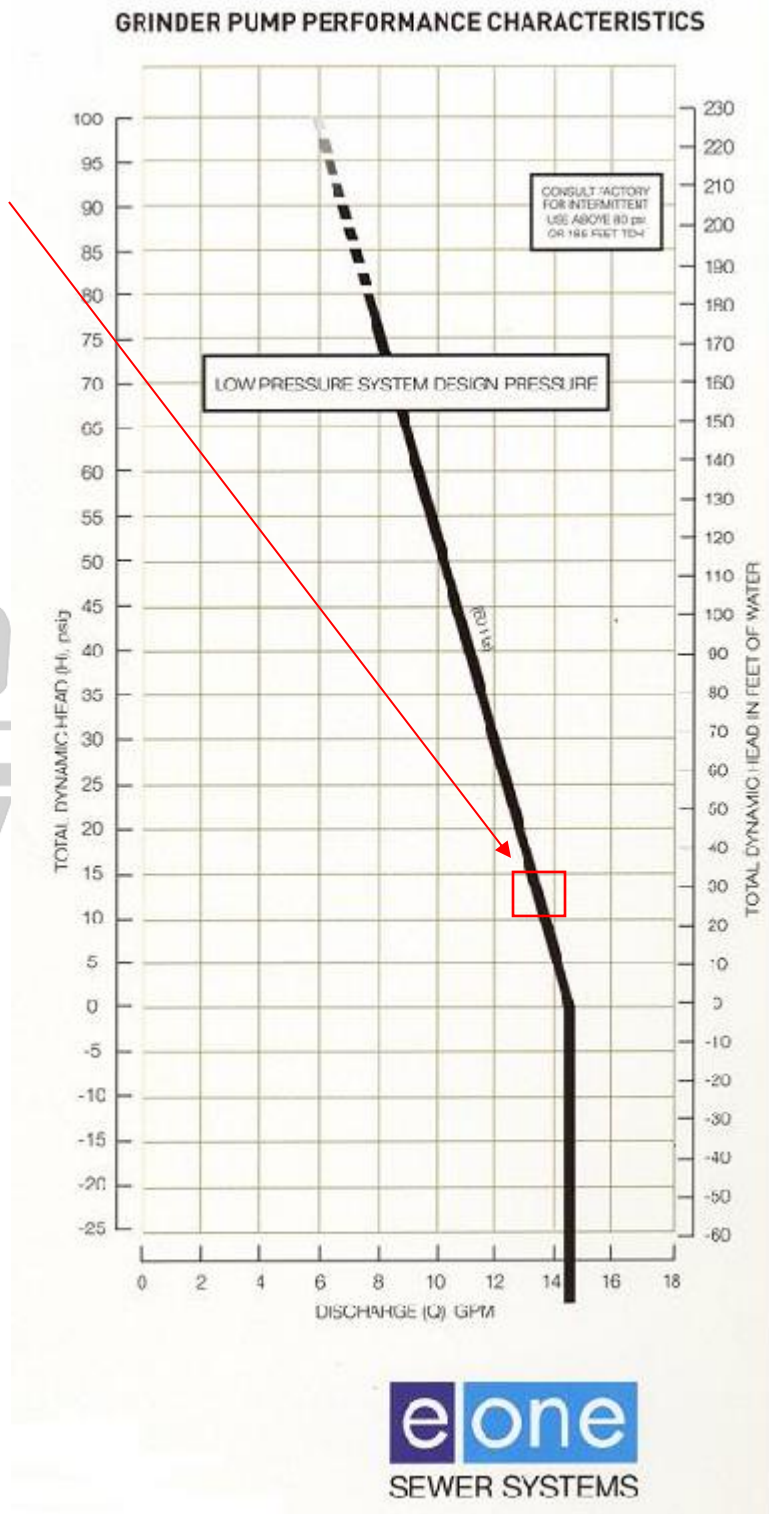


Operation Conditions

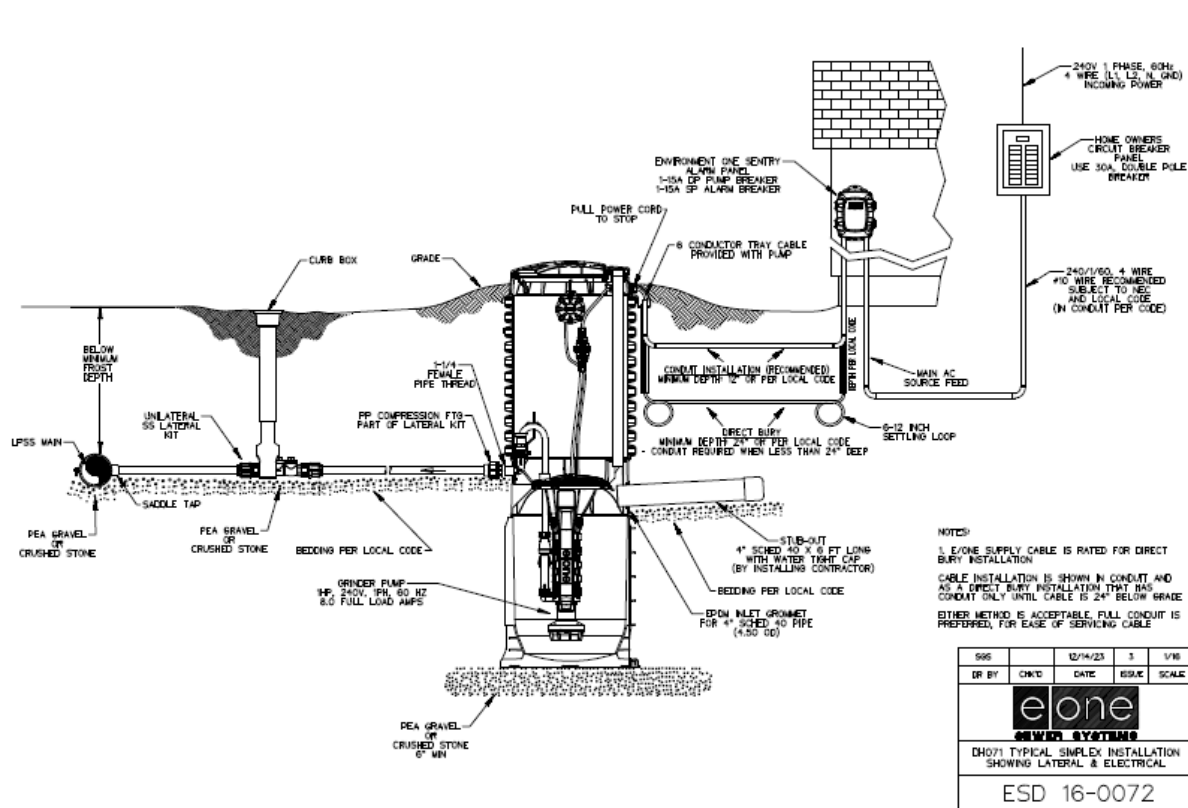
26.94 and 32.15 TDH at simultaneous operating conditions with the expected number of pumps operating in each zone, or the head of an individual pump operating in a single zone condition.

Operating range of E/One pumps from 0-185 feet TDH and from 0 to -60 feet TDH.

Anti-siphon valves in E/One cores provide for negative head pumping. In common systems with negative heads of 25-30 feet or more we recommend the use of combination air/vacuum release valves as described below.



This image shows the typical layout of an outdoor pump unit for single-family home use. This layout will be very similar to the duplex layout. All piping for inlets and discharge will have the same orientation as shown above. The pump unit is furnished complete, ready for installation. The installer needs to confirm the power cord length and discharge and inlet configuration. Standard products are supplied with 32 foot power supply cable. Standard inlets are 4-inch Schedule 40 Grommets (@ zero degrees) with 1-1/4 inch discharge (@ 180 degrees). Other configurations are available.



Lateral Connections

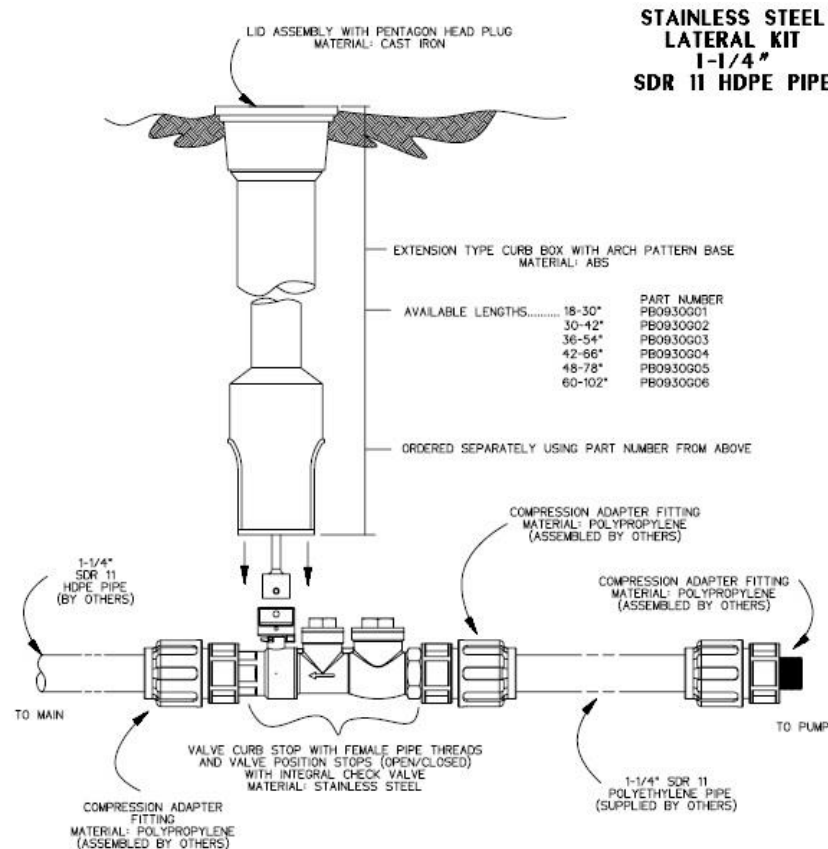


Pressure Sewer System pumps must be isolated from the common mainline with a corporation stop and curb stop lateral kit.

The lateral kit will have a full port ball valve and full port redundant check valve. Check valves shall be rated for 150 psi minimum system operating pressure including system back pressure.

Components are to be corrosion resistant Stainless Steel with Corrosion resistant PVC, Polypropylene or HDPE materials.

REME
S E R I E S



NOTES:

1. SS CURB STOP/CHECK VALVE AND FITTINGS ARE PROVIDED SEPARATELY, TO BE ASSEMBLED BY OTHERS
2. TO ASSEMBLE, APPLY A DOUBLE LAYER OF TEFLON TAPE, AND A LAYER OF PIPE DOPE (SUPPLIED BY OTHERS) TO THE THREADS ON THE PLASTIC FITTINGS AND INSTALL PER THE MANUFACTURER'S INSTRUCTIONS
3. ASSEMBLY IS TO BE PRESSURE TESTED (BY OTHERS)
4. ASSEMBLY IS TO BE USED WITH SDR11 HDPE PIPE
5. TO ORDER SS LATERAL KIT, USE PART NUMBER NC0193G01
6. CURB BOX IS TO BE ORDERED SEPARATELY, SEE ABOVE

KIT PARTS ARE NOT ASSEMBLED

SGS	DN	11/02/11	A	3/16
DR BY	CHK'D	DATE	ISSUE	SCALE
eone SEWER SYSTEMS STAINLESS STEEL LATERAL KIT 1-1/4" SDR 11 HDPE PIPE NA0330P02				

SERVICE OPERATIONS

**9 Town Forest Rd
Oxford, MA 01540**

D: (508) 765-0051

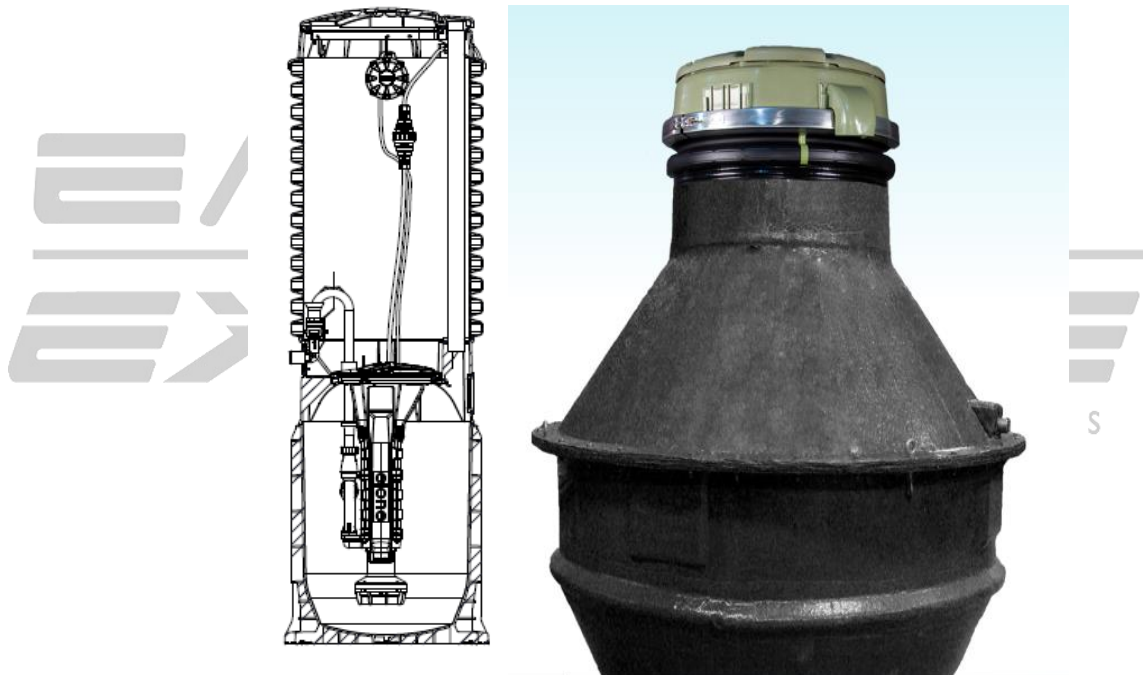
We recommend Pump Model DH502-104 for the 45 unit building. The station height can be adjusted to meet variable inlet elevations with 6 inch and 2 foot extensions. Stations and riser sections can be adjusted in heights in 4-inch increments. These stations are UL listed NSF and CSA certified.

Model DH071-93 Outdoor Pump

Station is rated to flows up to 700 gpd

Model DH502-104 Outdoor Pump

Station is rated to flows up to 6,000 gpd



Other station configurations are available for higher flow requirements. Please contact us for more information. Additional information may be found at www.eone.com



Standard alarm panels are the Sentry® panel mounted outside of the home as shown in the drawing (above).

Options include emergency (see photo) and Redundant panel shown. Other panel available. See the partial listing



generator connection alarm Remote Sentry® configurations are of panel options below.

- Basic Panels include circuit breaker for the pump and separate breaker for the alarm. These panels include alarm light, alarm buzzer and alarm silence button. **All F. R. Mahony panels are equipped with dry contacts to enable the connection of the Remote Sentry® (battery powered redundant alarm panel option)**
- Standard options include auto transfer generator connection shown above. This panel provides automatic power transfer without having to open the alarm panel or having to operate any manual transfer switching. This feature can be added to the basic panel or the panels offered below.
- Popular options include the **“Protection Package”** which monitors and protects the system from:
 - Pump Run Dry Condition (Pump running out of water)
 - Pump Overpressure Condition (Closed valve)
 - Brownout Condition (Main voltage under 12% of nameplate)
 - High Liquid Level
- The **“Protect Plus”** panel features offer the same items in the “Protection Package” plus the following:
 - High & Low Amperage draw by the pump
 - High & Low voltage to the pump
 - Extended Runtime by the pump (indicating wear or excessive flow) (field adjustable settings)
 - Monitoring of:
 - Real-time Pump Voltage and Current
 - Cycles & Hours (can be reset)
 - Minimum & Maximum Amperage (can be reset)
 - Minimum, Maximum, Average, and Last Run Cycle (in minutes, can be reset)

The Sentry Duplex Protect Plus panel is an Environment One full-featured Alarm/Monitor panel. The Sentry Duplex Protect Plus panel monitors for the following operating conditions:

- Pump Run Dry Condition – Pump running out of water
- Pump Overpressure Condition – Pump operating at abnormally high wattage level
- Brownout Condition – Mains voltage under 12% of nameplate rating
- Overvoltage Condition – Mains voltage above 12% of nameplate rating
- High Liquid Level Real-time,
- High, and Low Voltage to the Pump Real-time,
- High, and Low Wattage drawn by the Pump
- Extended Pump Runtime (field programmable limit)

The Sentry Duplex Protect-Plus Panel displays pump status, operating parameters, and user options by means of the following indicators: LCD Display to show Pump & Panel operating conditions Four Status Indicators:

- Ready (Green LED)
- Pump Running (Green LED)
- Trouble (Amber LED)
- High Level Alarm (Red LED)

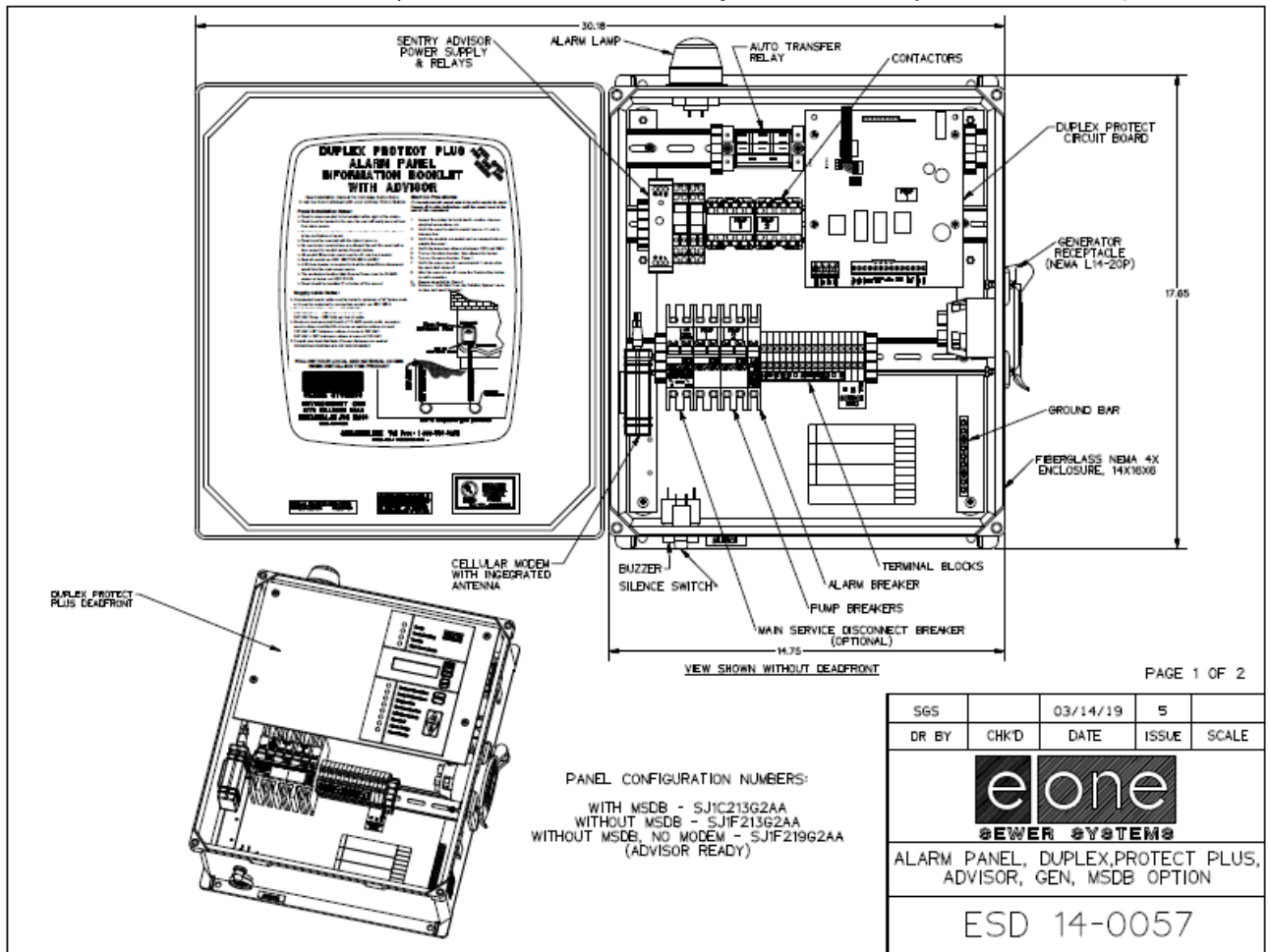
Eight Selectable Modes to view or change panel operation Menu Navigation Buttons – Enter, Scroll, Mode, ↑ ‘A’ and ↓ ‘B’



Standard Features

- Corrosion-proof fiberglass enclosure
 - NEMA 4X rated enclosure
- Lockable latch with padlock
 - Circuit breakers
- Terminal blocks & ground lugs
 - Dry Contacts
- Lead/Lag indicator lights
 - Alarm indicator lights
 - Run indicator lights
 - Manual Push-to-Run

Panel options, Emergency Generator transfer switch and remote power inlet.



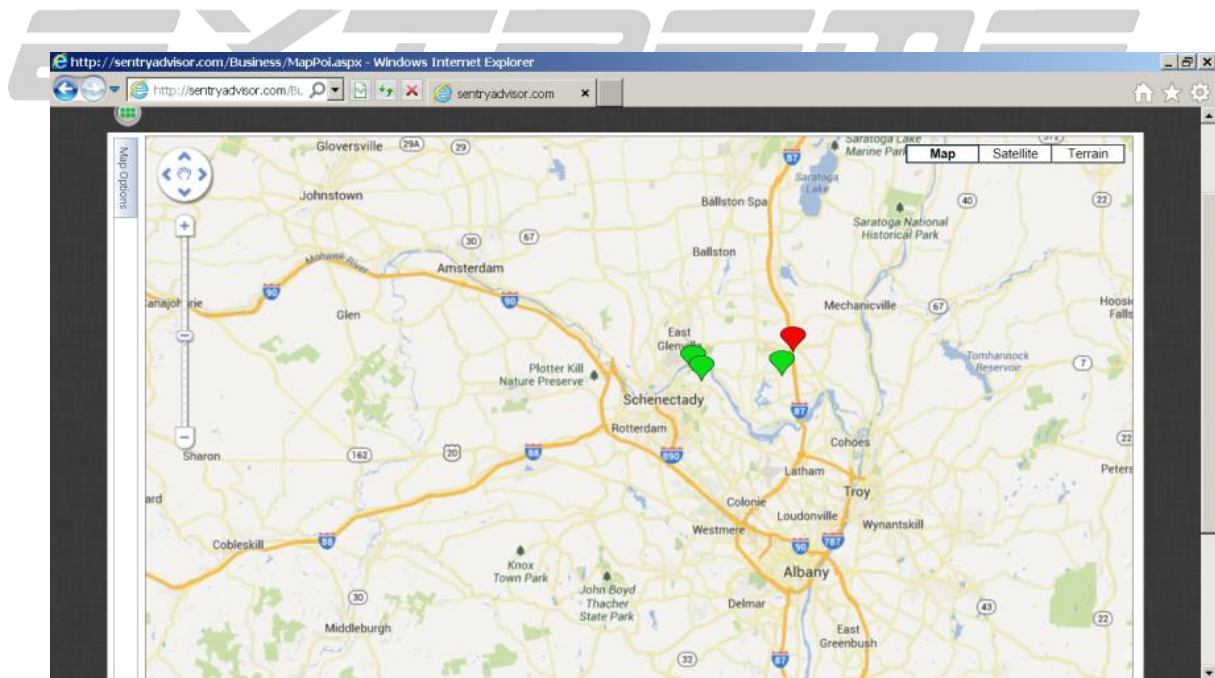
E/One Sentry Advisor offers a new level of sewer system monitoring and protection — and can even predict service needs. Let E/One Sentry Advisor monitor your system and help reduce the number of emergency service call-outs and eliminate unnecessary overtime.

E/One Sentry Advisor monitors pump performance and records every start, run time duration and stop of each grinder pump on the system. Alarm conditions can be sent automatically to service personnel. Use reports to review system performance and spot data trends such as frequent alarms or unusually long run times.

The online mapping feature shows the location of each grinder pump in the system, whether there are a few stations or hundreds.

The modem in the alarm panel transmits pump run and alarm data. The web interface can be configured to send alarm notices via SMS text, phone or e-mail to multiple contacts. Data is stored online and can be used to generate system performance reports and help identify pending service needs.

System mapping can be used for quick overview of operating conditions.



Standard Package

- Includes all necessary components and wiring — cellular modem, antenna, auxiliary power supply, and dry contacts for both high level alarm and pump running
- High level alarm
- Run time meters (daily, cumulative, last run, minimum/maximum/average)
- Cycle counters (daily and cumulative)
- Extended run time alerts (cycle, daily, etc.)
- Generate pump run and/or alarm event reports
- Map the location of each grinder pump in the system
- Battery back-up for power loss notification

Optional Features (Protect Plus Panels only)

- Brownout and over-voltage alerts
- Run dry and over-pressure alerts
- Volts, amps, watts historical information
- Volts, amps, watts related alerts
- Detailed system status
- Visibility or system settings and user defined options
- Board-level fault indications (DIP switch, watt meter, alarm circuit protection)

All Components fit neatly inside the Sentry Panel. Reporting is through web based access with voice, text, and email alerts of critical events.



SENTRY ADVISOR BASIC SENTRY SIMPLEX

REMOTE MONITORING OF:

- HIGH LEVEL ALARM
- PUMP RUNNING

WEB INTERFACE PROVIDES:

- RUN TIME HISTORY
 - DAILY, CUMULATIVE, LAST, MIN., MAX., AVG.
- CYCLE HISTORY
 - DAILY, CUMULATIVE
- EXTENDED RUN TIME ALERTS
 - CYCLE, DAILY
- GENERATE PUMP RUN AND/OR ALARM EVENT REPORTS
- MAP LOCATION OF EACH GRINDER PUMP IN THE SYSTEM WITH STATUS INDICATION

BACKUP BATTERY FOR POWER LOSS NOTIFICATION

USES EXISTING BOARD ALARM DRY CONTACTS

FACTORY INSTALLED, RETROFIT, OR STANDALONE CONFIGURATIONS AVAILABLE

OPERATING TEMPERATURE RANGE:
-20C TO +70C

INPUT VOLTAGE:
85 - 264VAC

MODEM CONTAINS:

- 2 AUXILIARY A-D INPUTS
- 3 AUXILIARY DIGITAL OUTPUTS



CELLULAR MODEM WITH INTEGRATED ANTENNA

CABLE ASSEMBLY

EXTRA TERMINAL BLOCKS

20W, 12VDC POWER SUPPLY

RELAY FOR RUNTIME DRY CONTACTS

SILENCE

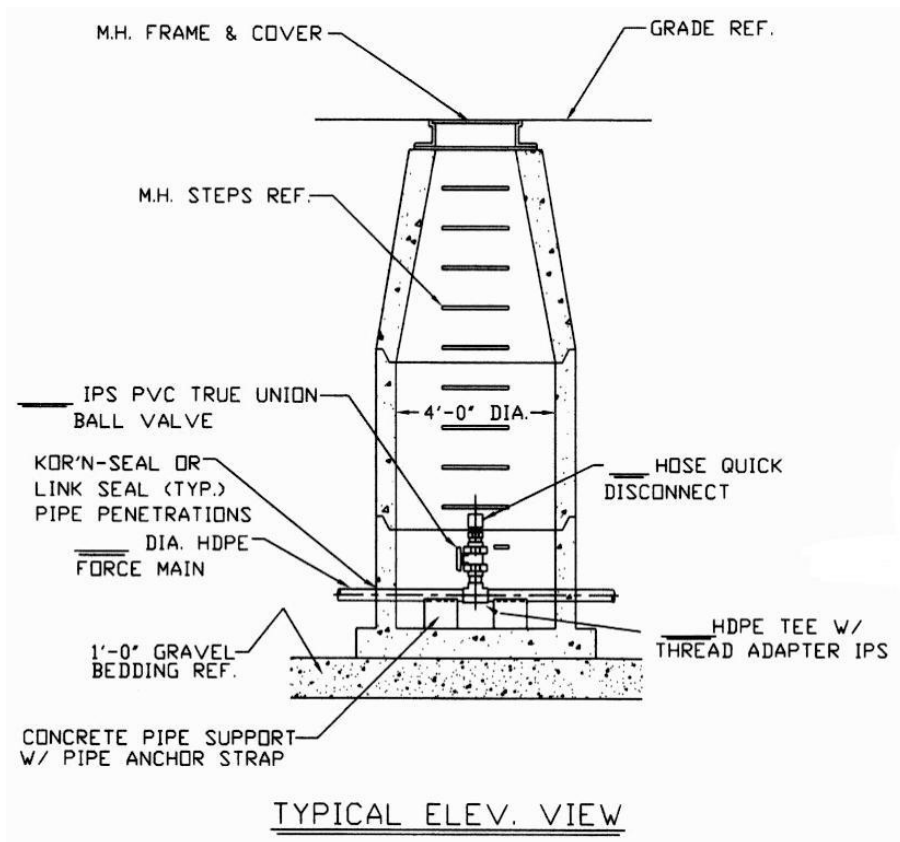
TYPICAL SENTRY PANEL IN SENTRY ENCLOSURE, SHOWN FOR REF. ENCLOSURE DOOR NOT SHOWN



BF	11/08/2013	CTT	-	11/11/2013
DR BY	DATE	CHK'D	ISSUE	DATE
 ENVIRONMENT ONE CORPORATION CUT SHEET, ADVISOR, BASIC SENTRY 240V, 2P NA0440P02				

Typical Cleanout Detail (Optional Air/Vacuum Valve shown –right)

Cleanout detail can be modified to match typical installation needs. Inline shut offs may be added to isolate flow direction. Image shown is flow through cleanout. These structures can be terminal end of line cleanouts, or junction cleanouts as may be required. Optional air and vacuum relief valves may be added when required.





Environment One Corporation

Pressure Sewer Preliminary

Cost and Design Analysis

For

Barra Rd- Biddeford ME Duplex Lots

Prepared For:

Christopher MacDonald, P.E. BH2M Engineers

380B Main Street

Gorham

Maine 04038

Tel: 207 839-2771 x 203

Fax:

Prepared By: D.Coppola

June 27, 2024

Barra Rd- Biddeford ME Duplex Lots

Prepared by : D.Coppola

On: June 27, 2024

Notes :

This report is showing the proposed Avesta properties and if we made the 7 lots duplex lots

<<<<< END OF NOTES >>>>>

PRELIMINARY PRESSURE SEWER - PIPE SIZING AND BRANCH ANALYSIS

Barra Rd- Biddeford ME Duplex Lots

Prepared By:

D.Coppola

June 27, 2024

Zone Number	Connects to Zone	Number of Pumps in Zone	Accum Pumps in Zone	Gals/day per Pump	Max Flow Per Pump (gpm)	Max Sim Ops	Max Flow (GPM)	Pipe Size (inches)	Max Velocity (FPS)	Length of Main this Zone	Friction Loss Factor (ft/100 ft)	Friction Loss This Zone	Accum Fric Loss (feet)	Max Main Elevation	Minimum Pump Elevation	Static Head (feet)	Total Dynamic Head (ft)
This spreadsheet was calculated using pipe diameters for:						SDR11HDPE	Friction loss calculations were based on a Constant for inside roughness "C" of:										150
1.00	2.00	2	2	6000	14.76	2	29.52	2.00	3.19	115.00	2.05	2.36	15.87	125.00	125.00	0.00	15.87
2.00	2.00	14	16	200	14.65	4	58.64	3.00	2.92	1,221.00	1.11	13.51	13.51	115.00	96.00	19.00	32.51

PRELIMINARY PRESSURE SEWER - ACCUMULATED RETENTION TIME (HR)

Barra Rd- Biddeford ME Duplex Lots

Prepared By:

D.Coppola

June 27, 2024

Zone Number	Connects to Zone	Accumulated Total of Pumps this Zone	Pipe Size (inches)	Gallons per 100 lineal feet	Length of Zone	Capacity of Zone	Average Daily Flow	Average Fluid Changes per Day	Average Retention Time (Hr)	Accumulated Retention Time (Hr)
This spreadsheet was calculated using pipe diameters for: SDR11HDPE								Gals per Day per Dwelling		200
1.00	2.00	2	2.00	15.40	115.00	17.71	12,000	677.46	0.04	0.70
2.00	2.00	16	3.00	33.47	1,221.00	408.63	14,800	36.22	0.65	0.66



Environment One Corporation

Pressure Sewer Preliminary

Cost and Design Analysis

For

Barra Rd- Biddeford ME Simplex Lots

Prepared For:

Christopher MacDonald, P.E. BH2M Engineers

380B Main Street

Gorham

Maine 04038

Tel: 207 839-2771 x 203

Fax:

Prepared By: D.Coppola

June 27, 2024

Barra Rd- Biddeford ME Simplex Lots

Prepared by : D.Coppola

On: June 27, 2024

Notes :

This report is showing the proposed Avesta properties and for 7 single family lots

<<<<< END OF NOTES >>>>>

PRELIMINARY PRESSURE SEWER - PIPE SIZING AND BRANCH ANALYSIS

Prepared By:

D.Coppola

Barra Rd- Biddeford ME Simplex Lots

June 27, 2024

Zone Number	Connects to Zone	Number of Pumps in Zone	Accum Pumps in Zone	Gals/day per Pump	Max Flow Per Pump (gpm)	Max Sim Ops	Max Flow (GPM)	Pipe Size (inches)	Max Velocity (FPS)	Length of Main this Zone	Friction Loss Factor (ft/100 ft)	Friction Loss This Zone	Accum Fric Loss (feet)	Max Main Elevation	Minimum Pump Elevation	Static Head (feet)	Total Dynamic Head (ft)
This spreadsheet was calculated using pipe diameters for SDR11HDPE								Friction loss calculations were based on a Constant for inside roughness "C" of: 50									
1.00	2.00	2	2	6000	14.76	2	29.52	2.00	3.19	115.00	2.05	2.36	10.30	125.00	125.00	0.00	10.30
2.00	2.00	7	9	200	14.65	3	44.01	3.00	2.19	1,221.00	0.65	7.94	7.94	115.00	96.00	19.00	26.94

PRELIMINARY PRESSURE SEWER - ACCUMULATED RETENTION TIME (HR)

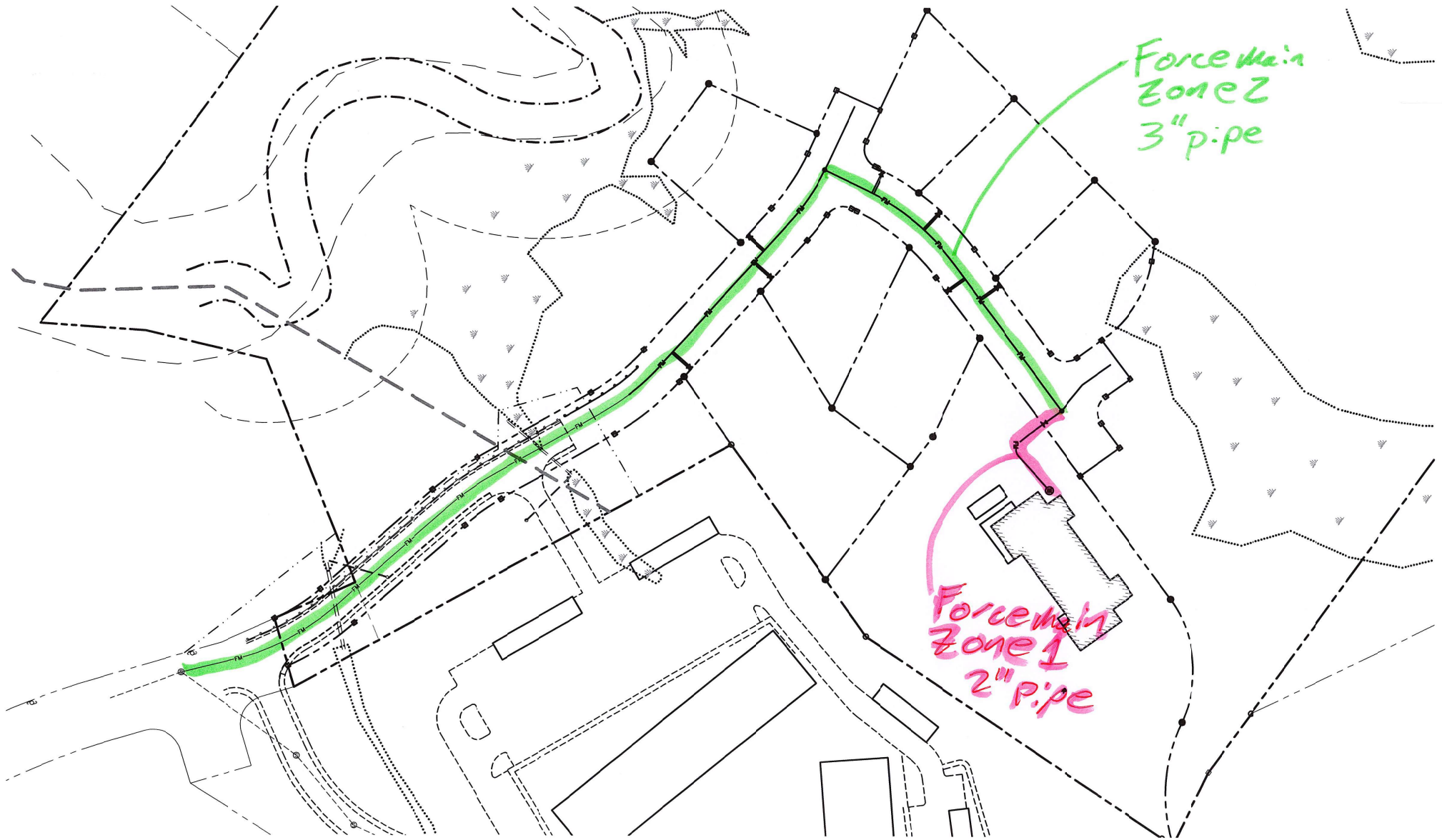
Barra Rd- Biddeford ME Simplex Lots

Prepared By:

D.Coppola

June 27, 2024

Zone Number	Connects to Zone	Accumulated Total of Pumps this Zone	Pipe Size (inches)	Gallons per 100 lineal feet	Length of Zone	Capacity of Zone	Average Daily Flow	Average Fluid Changes per Day	Average Retention Time (Hr)	Accumulated Retention Time (Hr)
This spreadsheet was calculated using pipe diameters for: SDR11HDPE				Gals per Day per Dwelling					200	
1.00	2.00	2	2.00	15.40	115.00	17.71	12,000	677.46	0.04	0.77
2.00	2.00	9	3.00	33.47	1,221.00	408.63	13,400	32.79	0.73	0.73





ATTACHMENT 5
CITY COST ESTIMATE WORKSHEET



City of Biddeford, Maine

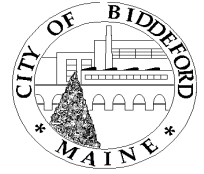
COST ESTIMATE WORKSHEET

OWNER/APPLICANT: Avesta Housing

PB #: 2024.18

PROJECT NAME: Barra Road 46-Unit Elderly Housing

DATE: 17-Jul-24



	ITEM	UNIT	QUANTITY	UNIT COST	TOTAL
1	Clearing and Grubbing	Acre	1.79	\$6,000.00	\$10,740.00
2	Erosion/Sediment Control	Lump Sum	1	\$10,000.00	\$10,000.00
3	Site Stabilization	Lump Sum	1	\$5,000.00	\$5,000.00
4	Ledge Removal	Cubic Yard	1500	\$60.00	\$90,000.00
5	Sanitary Sewer				
	Manholes	Each			\$0.00
	Main	Linear Foot			\$0.00
	House Services	Linear Foot	115	\$30.00	\$3,450.00
6	Water Main				
	Main	Linear Foot	230	\$60.00	\$13,800.00
	House Services	Linear Foot	150	\$37.00	\$5,550.00
	Hydrants	Each	1	\$5,000.00	\$5,000.00
7	Electric				
	Underground Utility Trench	Linear Foot	150	\$30.00	\$4,500.00
	Conduit/Wiring	Linear Foot	150	\$30.00	\$4,500.00
	Transformer Bases	Each	1	\$2,500.00	\$2,500.00
8	Storm Drainage				
	Pipe/Culvert	Linear Foot		\$60.00	\$0.00
	Catch Basin	Each	12	\$7,500.00	\$90,000.00
	Other Treatment Devices	Each	1	\$20,000.00	\$20,000.00
9	Stormwater Management				
	Outlet Control Structure	Each			\$0.00
	Stromwater Management Facilities	Each			\$0.00
10	Excavate and Grade Subgrade	Cubic Yard	3725	\$20.00	\$74,500.00
11	Roadways				
	Subbase Gravel	Cubic Yard			\$0.00
	Base/Finish Gravel	Cubic Yard			\$0.00
	Base Paving	Ton			\$0.00
	Finish Paving	Ton			\$0.00
	Geotextile Fabric	Ton			\$0.00
12	Sidewalks				
	Subbase Gravel	Cubic Yard			\$0.00
	Base/Finish Gravel	Cubic Yard			\$0.00
	Base Paving	Ton			\$0.00
	Finish Paving	Ton			\$0.00
13	Parking Lots/Other Areas				
	Subbase Gravel	Cubic Yard	1306	\$30.00	\$39,166.67
	Base/Finish Gravel	Cubic Yard	290	\$38.00	\$11,013.67
	Base Paving	Ton	283	\$120.00	\$33,938.70
	Finish Paving	Ton	177	\$120.00	\$21,262.80

City of Biddeford, Maine

COST ESTIMATE WORKSHEET

14	Curbing – Bituminous	Linear Foot	829	\$15.00	\$12,435.00
15	Curbing - Concrete				
15	Curbing – Granite	Linear Foot			\$0.00
16	Pavement Striping	Linear Foot	800	\$5.00	\$4,000.00
17	Guardrail	Linear Foot	169	\$120.00	\$20,280.00
18	Fencing	Linear Foot			\$0.00
19	Loam and Seed	1,000 Square Feet	41	\$400.00	\$16,335.60
20	Riprap	Cubic Yard	60	\$30.00	\$1,800.00
21	Landscaping	Lump Sum	1	\$30,000.00	\$30,000.00
22	Street Lights	Each			\$0.00
23	Site Lighting	Each	21	\$1,500.00	\$31,500.00
24	Monuments/Iron Pipes	Lump Sum			\$0.00
25	Clean Up	Lump Sum	1	\$5,000.00	\$5,000.00
26	As Builts	Lump Sum	1	\$10,000.00	\$10,000.00
27	Other				\$0.00
28	Other				\$0.00
29	Other				\$0.00
30	Other				\$0.00
31	Other				\$0.00

COST ESTIMATE TOTAL:

\$576,272.43

150% of TOTAL:

\$864,408.65

FOR OFFICE USE ONLY

EROSION CONTROL/SITE STABILIZATION BOND (IF APPLICABLE):

PERFORMANCE GUARANTEE REQUIRED:

Name:

Signature:

Date:



ATTACHMENT 6
UPDATED STORMWATER MANAGEMENT REPORT



STORMWATER MANAGEMENT REPORT

BARRA ROAD SUBDIVISION

**Barra Road
Biddeford, Maine**

Submitted by:

**Indian Cliff Development Corp.
260 Main Street
P.O. Box 444
Biddeford, ME**

And

**Avesta Housing
307 Cumberland Avenue
Portland, ME**

Prepared by:



Date:
July 2024

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1.0 INTRODUCTION

Indian Cliff Development Corporation is proposing to permit a 9 lot subdivision known as Barra Road Subdivision (the Subdivision project). The project is proposed to subdivide an approximate 7 acre portion of a larger parcel, approximately 56 acres, off of the current end of Barra Road in Biddeford, ME, known as Map 7 lot 15. The subdivision proposes to construct 2 new roads to service the subdivision, one being an extension of Barra Road, and the second being Trailside Way. The subdivision will include 7 residential lots, Lots B-G and J, meeting bulk and space standards for 2-unit duplex homes that will be offered for sale and development by others at a future time. The larger approximate 2.2-acre lot, Lot A, is proposed to be developed Avesta Housing to develop a 46-unit elderly affordable housing project (the Site project), consisting of a 4-story building, and associated parking and amenities. An additional lot, Lot H, is proposed as a non-buildable lot proposed for stormwater and site access to an abutting property. These projects are required to obtain a City of Biddeford Subdivision permit for Indian Cliff Development's 9-lot subdivision, and a City of Biddeford Site and Subdivision permit for Avesta Housing's 46-unit affordable housing project. These projects will also jointly file for a required Stormwater Law Permit from the Maine DEP.

The scope of work for these projects includes but is not limited to:

- Tree clearing and grubbing
- Stump and boulder removal
- Construction of 27' wide paved roadways with a 5' sidewalk
- Extension of municipal services and associated service connection stubs
- Installation of underground electric and communications conduit and transformer pads
- Installation of storm drain system including catch basins, storm drain culverts, and vegetated swales.
- Construction of Grassed Underdrained Soil Filters
- Construction of proposed 46-unit affordable elderly housing building and associated utilities, parking, and stormwater management facilities.

The Stormwater Management Plan has been prepared to satisfy the requirements of the Maine Department of Environmental Protections "Stormwater Management Rules" Chapters 500, 501 and 502, the most recent version of the "Maine Stormwater Best Management Practices Manual", and the City of Biddeford's Stormwater Ordinance.

1.1 OVERVIEW OF MODELING METHODOGY AND SOURCE INFORMATION

Hydrologic Analysis: The pre and post development conditions have been modeled using modeling software (Hydrocad Version 10) which is based upon the methodology contained within the USDA Soil Conservation Service Technical Release 55. Type III 24-hour storm distributions for York County were used for the analysis. The following return periods and 24-hour rainfall depths were used for the analysis:

Return Period	24-Hour Rainfall Depth
2-Year Storm	3.30 inches
10-Year Storm	4.90 inches
25-Year Storm	6.20 inches

Soils: The soils used for the stormwater analysis were digitized from the Natural Resource Conservation Service (NRCS), web soil survey website. The source of the data is the Cumberland County Soil Survey (Class D). Refer to the following for additional documentation regarding the soils used for modelling:

- Appendix A of this Report
- Pre and Post Development Watershed Plans (Sheets A and B)

The onsite soils include:

Soil Map Unit	Unit Description	Hydrologic Soil Group
BuC	Buxton silt loam, 8-15% slopes	C
LyB	Lyman-Rock outcrop complex, 3-8% slopes	D
LyC	Lyman-Rock outcrop complex, 8-15% slopes	D
Sc	Scantic silt loam, 0-3% slopes	D

Topography: Ground Survey by BH2M and LIDAR data from the NOAA LiDAR Digital Coast Dataset

Natural Resources: Wetland delineations performed by Mark Hampton Associates

1.2 DESCRIPTION OF POINTS OF ANALYSIS

The watershed model analyzes the discharge of runoff at five Analysis Points as described below:

Analysis Point #1

Description: Culmination of flow along Thatcher Brook.

Pre Development Tributary Drainage Areas: 7.84 Acres

Post Development Tributary Drainage Areas: 7.96 Acres

Analysis Point #2

Description: Point flow to wetland along south eastern property line.

Pre Development Tributary Drainage Areas: 6.66 Acres

Post Development Tributary Drainage Areas: 6.95 Acres

Analysis Point #3

Description: Culmination of flow to low point at south western property line.

Pre Development Tributary Drainage Areas: 1.16 Acres

Post Development Tributary Drainage Areas: 0.75 Acres

1.3 PRE DEVELOPMENT CONDITIONS

The Existing Conditions are shown on Sheet 2 and Sheet A of the accompanying plans. The portion parcel to be developed encompasses an area of approximately 7 acres and is located on Barra Road in Biddeford. The parcel is mostly wooded and lies within the Thatcher Brook Watershed.

The watershed that was analyzed for this project is approximately 15.7 acres. The analysis points are described in Section 1.2 of this report. The watershed generally flows from a ridgeline central to the project and runs primary south, east and west. The project is bounded by woodland areas to the east and north, a residential apartment complex currently under construction to the south, and Thatcher Brook to the west.

The Pre-Development Watershed Map is included as Sheet A of the accompanying plans and the Calculations are attached as Appendix B.

The Pre-Development Watershed Model predicts the following peak flow rates:

Pre-Development Peak Flows (cu. ft./sec)			
Analysis Point	2-Year	10-Year	25-Year
AP-1	7.20	15.25	22.36
AP-2	6.10	12.15	17.39
AP-3	1.00	2.23	3.32

1.4 POST DEVELOPMENT CONDITIONS

The overall projects propose construction of the Subdivision by Indian Cliff Development and the proposed Site project by Avesta Housing. The Subdivision will

include construction of 27' wide paved roadways and 5' sidewalk intended to meet City of Biddeford standards, along above ground and underground municipal services for water, sewer, drainage specific to the Subdivision project, gas, and electric and data to support the development of the 9 new lots. The 7 duplex lots proposed by Indian Cliff Development for this subdivision are proposed to be developed by others at a later date, and service connections will be stubbed in at the time of the construction of the extension of Barra Road and Trailside Way.

Avesta Housing proposes to develop a 2.2 acre parcel as a 46-unit affordable elderly housing development as soon as development of the Subdivision and funding sources will allow. This will include the building, parking lot, connections to municipal utilities installed for the Subdivision project, and stormwater systems specific to the Site project.

For the Subdivision project, it should be noted that the 7 duplex lots proposed for future development by others have been included in the stormwater models assuming 1,000 sf per unit for driveways, or 2,000 sf per lot, and 3000 sf per lot for the duplex homes. While these assumptions are being provided in the stormwater run off models, these are not carried forward in the treatment calculations presented in the General Standards, section 1.6 of this report, as these lots are not proposed to be developed with the initial development of the Subdivision. The below is a summary of the proposed developed areas associated with construction of the public infrastructure associated with development of the Subdivision roads, and assumed duplex home lot development.

Proposed Impervious Area (Subdivision Roadways)	=	28,802 sf
Proposed Landscaped Area	=	41,974 sf
<u>Assumed Duplex Lot Development (treatment not required)</u>	=	<u>35,000 sf</u>
Proposed and Assumed Developed Area Subdivision	=	105,776 sf

Avesta Housing is proposing to develop the 46-unit affordable elderly housing project in conjunction of the initial development of the subdivision. The details of the developed areas for the Site project are summarized below.

Proposed Impervious Area (Site project Development)	=	37,192 sf
<u>Proposed Landscaped Area</u>	=	<u>40,839 sf</u>
Proposed Developed Area Avesta Site	=	78,031 sf

The projects will include Grassed Underdrained Soil Filters to provide treatment and attenuation of peak flows.

While the Subdivision and Site projects are proposed to be developed and permitted by separate entities, given the timing of development and interrelated impacts to the overall watersheds, it is best to review peak flows of their combined effects.

The Post Development Watershed Map is included as Sheet B of the accompanying plan set and the Calculations are attached as Appendix C.

The Post-Development Watershed Model predicts the following peak flow rates:

Post Development Peak Flows (cu. ft./sec)			
Analysis Point	2-Year	10-Year	25-Year
AP-1	7.34	15.28	22.08
AP-2	5.65	11.45	16.57
AP-3	0.61	1.35	2.02

1.5 **BASIC STANDARDS**

The proposed projects are required to meet the Basic Standards for the Maine DEP. To meet the Basic Standards the project designs must demonstrate that the erosion and sedimentation control, inspection and maintenance, and housekeeping standards specified in Appendices A, B, and C of 06-096 Chapter 500 (Maine DEP) are met, and that the grading or other construction activity will not impede or otherwise alter drainageways so as to have an unreasonable adverse impact on a wetland or waterbody, or an adjacent downslope parcel.

The proposed projects will provide temporary (during construction) BMP's and post-construction BMP's. Refer to Erosion Control Plans for each project's plan set plans for erosion and sedimentation control narratives and details. The project requirements for inspection and maintenance during construction and post-construction are described in the Erosion and Sedimentation Control - Inspection and Maintenance Plans found in Appendix E for the Subdivision and Appendix F for the Site project of this Report. The housekeeping standards can also be found in the respective Inspection and Maintenance Plans.

1.6 **GENERAL STANDARDS**

The proposed project is required to meet the General Standards. To meet the general standards, the project design must demonstrate that the stormwater management system includes treatment measures that will provide pollutant removal or treatment and mitigate for the increased frequency and duration of channel erosive flows due to runoff from smaller storms and potential temperature impacts. This must be achieved by providing treatment of no less than 95% of the impervious area and no less than 80% of the developed area. For linear portions of projects, the treatment requirements can be reduced to no less than 75% of the impervious area and no less than 50% of the developed area (See 06-096 Chapter 500 4.C(5)(c)). For development of these projects, we have assumed that the Subdivision portions of the project will meet the 75% linear exemption criteria, and the Site portion of the project will meet the 95% criteria.

The stormwater management system includes individual Grassed Underdrained Soil Filters for both roads of the Subdivision and an additional Grassed Underdrained Soil Filter for the Site project. The proposed soil filters have been designed in accordance with the design requirements outlined in the Maine Stormwater Best Management Practices Manual, Volume III, Chapter 7.1.

Below is a summary of the treatment areas associated with the proposed infrastructure. Refer to Appendix D for detailed calculations.

Stormwater Treatment Summary Indian Cliff Subdivision (Linear Project)	
Total Proposed (Linear) Impervious Area	28,802 sf
Total Proposed (Linear) Developed Area	70,776 sf
Total Treated (Linear) Impervious Area	27,325 sf
Total Treated (Linear) Developed Area	40,375 sf
Linear Subdivision Impervious Area Treatment %	94.9% (75% required)
Linear Subdivision Developed Area Treatment %	57.0% (50% required)

Stormwater Treatment Summary Avesta Site	
Total Proposed Impervious Area	37,192 sf
Total Proposed Developed Area	78,031 sf
Total Treated Impervious Area	37,192 sf
Total Treated Developed Area	64,152 sf
Impervious Area Treatment %	100.0% (95% required)
Developed Area Treatment %	82.2% (80% required)

As shown in the Table above, the stormwater management systems have been designed to meet the applicable General Standard requirements for both the Subdivision and Site projects. Detailed treatment calculations can be found in Appendix D.

1.7 **PHOSPHORUS STANDARD**

The proposed project is located in the watershed of Thatcher Brook. The proposed project is not located within the direct watershed of a lake or lake most-at-risk listed in 06-096 Chapter 502. The Phosphorus Standard does not apply to this project.

1.8 **URBAN IMPAIRED STREAM STANDARD**

The proposed project is located in the watershed of Thatcher Brook. The Thatcher Brook is listed in 06-096 Chapter 502 as an Urban Impaired Stream, however, as the projects have been assessed by Maine DEP as a Stormwater Law project and not subject to Site Location of Development permitting, the full Maine DEP Urban Impaired Stream Standard does not apply to the project.

However, as the project is being proposed in the City of Biddeford, the City does require that the projects within an Urban Impaired Stream Watershed pay into the Compensation Fee Utilization Plan (CFUP) managed by the City at Maine DEP's prescribed rates, based on Table 1 found in 06-096 CMR 501 3.A.(1). Where there are two distinct projects being proposed and permitted, there are two sets of impact fees that will need to be assessed:

CFUP Fee Schedule – Indian Cliff Development Subdivision Project			
Type of Surface	Compensation Fee (per acre)	Proposed Area (acres)	Compensation Fee
Non-roof Impervious Area	\$12,500	0.66	\$8,250
Roof	\$5,000	N/A	\$N/A
Landscape Area	\$2,500	0.96	\$2,400
Total			\$10,650

CFUP Fee Schedule – Avesta Site Project			
Type of Surface	Compensation Fee (per acre)	Proposed Area (acres)	Compensation Fee
Non-roof Impervious Area	\$12,500	0.60	\$7,500
Roof	\$5,000	0.25	\$1,250
Landscape Area	\$2,500	0.94	\$2,350
Total			\$11,100

1.9 **FLOODING STANDARD**

The proposed project is required to meet the Flooding Standards for the City of Biddeford. To meet the Flooding Standard, the project design must demonstrate that the stormwater management systems will accomplish the following:

- a) The system must detain, retain, or result in the infiltration of stormwater from 24-hour storms of the 2-year, 10-year, and 25-year frequencies such that the peak flows of stormwater from the project site do not exceed the peak flows of stormwater prior to undertaking the project.
- b) The design of piped or open channel systems must be based on a 25-year, 24-hour storm without overloading or flooding beyond channel limits.
- c) The areas expected to be flooded by runoff from a 10-year or 25-year, 24-hour storm must be defined, and no buildings or other similar facilities may be planned within such areas.
- d) Runoff from the project may not flood the primary access road to the project and any public roads bordering the project as a result of a 25-year, 24-hour storm.

Given the combined development of these projects, both the Subdivision and Site projects flooding criteria have been developed in a single model, but as a note, this model was broken between AP-1 and AP-2&3 due to node size limitations. The following table compares the Pre and Post Development peak flow rates for the 2-year, 10-year, and 25-year return periods. Refer to Appendix B for the Pre-Development model and Appendix C for Post Development model.

Peak Flow Comparison (cu. ft./sec)						
Analysis Point	2-Year		10-Year		25-Year	
	Pre	Post	Pre	Post	Pre	Post
AP-1	7.20	7.34	15.25	15.28	22.36	22.08
AP-2	6.10	5.65	12.15	11.45	17.39	16.57
AP-3	1.00	0.61	2.23	1.35	3.32	2.02

As illustrated in the table above, development of the proposed project will create a condition where most of the post development peak rates of runoff are decreased from the pre development peak rates of runoff for events for both the Subdivision and Site projects.

The models do suggest, however, that a slight increase in run off is predicted for AP-1 during only the 2 year and 10 year events in post-construction conditions. These very minor increases, 0.14 cfs for the 2-year and 0.03 cfs increase for the 10-year events are both less than a 2% increase in their respective modeled storm events over existing conditions. Reviewing the results, these increases are mostly driven due to assumed development of duplex house lots in post-development watershed SA-1 where the project cannot provide practical storage. Also considering AP 1 and 2 both flow directly to the Thatcher Brook watershed, reviewing the combined effects of these show a net reduction of run off to the river. Given the minor nature of these increase specifically at AP 1, that this is based on assumed future development, and the fact that this run off will go directly to Thatcher Brook with a net reduction, we do not expect downstream effects or flooding concerns. The projects request that waivers be granted by the City of Biddeford and Maine DEP as deemed necessary for these minor increases in run off.

Given these results, no adverse impacts will be created to the downstream conditions as a result of this development.

1.10 CLOSURE

The proposed stormwater management facilities have been designed to mitigate stormwater impacts associated with development of the proposed to meet the City of Biddeford Subdivision and Site permit requirements, as well as applicable sections of Chapter 500, 501 and 502 for Stormwater Law permit requirements.

Appendix A
Soils Reports

Appendix B
Pre Development Calculations

Appendix C
Post Development Calculations

Appendix D
Water Quality Calculations and BMP Sizing

Appendix G
Maine DEP Stormwater Application Checklist

Appendix A
Soils Reports



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for York County, Maine

Barra Road Development



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: York County, Maine
Survey Area Data: Version 22, Sep 5, 2023

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

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BuC	Buxton silt loam, 8 to 15 percent slopes	4.0	25.7%
LyB	Lyman-Rock outcrop complex, 3 to 8 percent slopes	0.5	3.2%
LyC	Lyman-Rock outcrop complex, 8 to 15 percent slopes	11.1	70.6%
Sc	Scantic silt loam, 0 to 3 percent slopes	0.1	0.4%
Totals for Area of Interest		15.7	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

York County, Maine

BuC—Buxton silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9k55

Elevation: 10 to 900 feet

Mean annual precipitation: 34 to 48 inches

Mean annual air temperature: 43 to 46 degrees F

Frost-free period: 90 to 160 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Buxton and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Buxton

Setting

Landform: Coastal plains

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Glaciolacustrine deposits derived from siltstone and/or fine-silty marine deposits

Typical profile

H1 - 0 to 7 inches: silt loam

H2 - 7 to 19 inches: silt loam

H3 - 19 to 37 inches: silty clay

H4 - 37 to 65 inches: silty clay

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Depth to water table: About 18 to 30 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Hydric soil rating: No

LyB—Lyman-Rock outcrop complex, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2trqh

Elevation: 0 to 560 feet

Mean annual precipitation: 36 to 65 inches

Mean annual air temperature: 36 to 52 degrees F

Frost-free period: 60 to 160 days

Farmland classification: Not prime farmland

Map Unit Composition

Lyman, very stony, and similar soils: 65 percent

Rock outcrop: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lyman, Very Stony

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountaintop, mountainbase, side slope, crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 3 inches: loam

E - 3 to 5 inches: fine sandy loam

Bhs - 5 to 7 inches: loam

Bs1 - 7 to 11 inches: loam

Bs2 - 11 to 18 inches: channery loam

R - 18 to 28 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent

Surface area covered with cobbles, stones or boulders: 1.5 percent

Depth to restrictive feature: 11 to 24 inches to lithic bedrock

Drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.03 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Custom Soil Resource Report

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountaintop, mountainbase, side slope, crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Igneous and metamorphic rock

Typical profile

R - 0 to 10 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: 0 inches to lithic bedrock

Capacity of the most limiting layer to transmit water (Ksat): Very low to very high
(0.00 to 14.17 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydric soil rating: Unranked

LyC—Lyman-Rock outcrop complex, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2trqj

Elevation: 0 to 790 feet

Mean annual precipitation: 36 to 65 inches

Mean annual air temperature: 36 to 52 degrees F

Frost-free period: 60 to 160 days

Farmland classification: Not prime farmland

Map Unit Composition

Lyman, very stony, and similar soils: 62 percent

Rock outcrop: 25 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lyman, Very Stony

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountaintop, mountainbase, side slope, crest

Custom Soil Resource Report

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 3 inches: loam

E - 3 to 5 inches: fine sandy loam

Bhs - 5 to 7 inches: loam

Bs1 - 7 to 11 inches: loam

Bs2 - 11 to 18 inches: channery loam

R - 18 to 28 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent

Surface area covered with cobbles, stones or boulders: 1.5 percent

Depth to restrictive feature: 11 to 24 inches to lithic bedrock

Drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.03 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Ecological site: F144BY701ME - Shallow Till

Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountaintop, mountainbase, side slope, crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Igneous and metamorphic rock

Typical profile

R - 0 to 10 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: 0 inches to lithic bedrock

Capacity of the most limiting layer to transmit water (Ksat): Very low to very high (0.00 to 14.17 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Ecological site: F144BY801ME - Rockland (reserved)

Hydric soil rating: Unranked

Sc—Scantic silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2slv3

Elevation: 10 to 900 feet

Mean annual precipitation: 33 to 60 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 160 days

Farmland classification: Not prime farmland

Map Unit Composition

Scantic and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scantic

Setting

Landform: River valleys, marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Glaciomarine deposits

Typical profile

Ap - 0 to 9 inches: silt loam

Bg1 - 9 to 16 inches: silty clay loam

Bg2 - 16 to 29 inches: silty clay

Cg - 29 to 65 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: About 0 to 12 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: D

Ecological site: F144BY304ME - Wet Clay Flat

Hydric soil rating: Yes

References

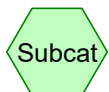
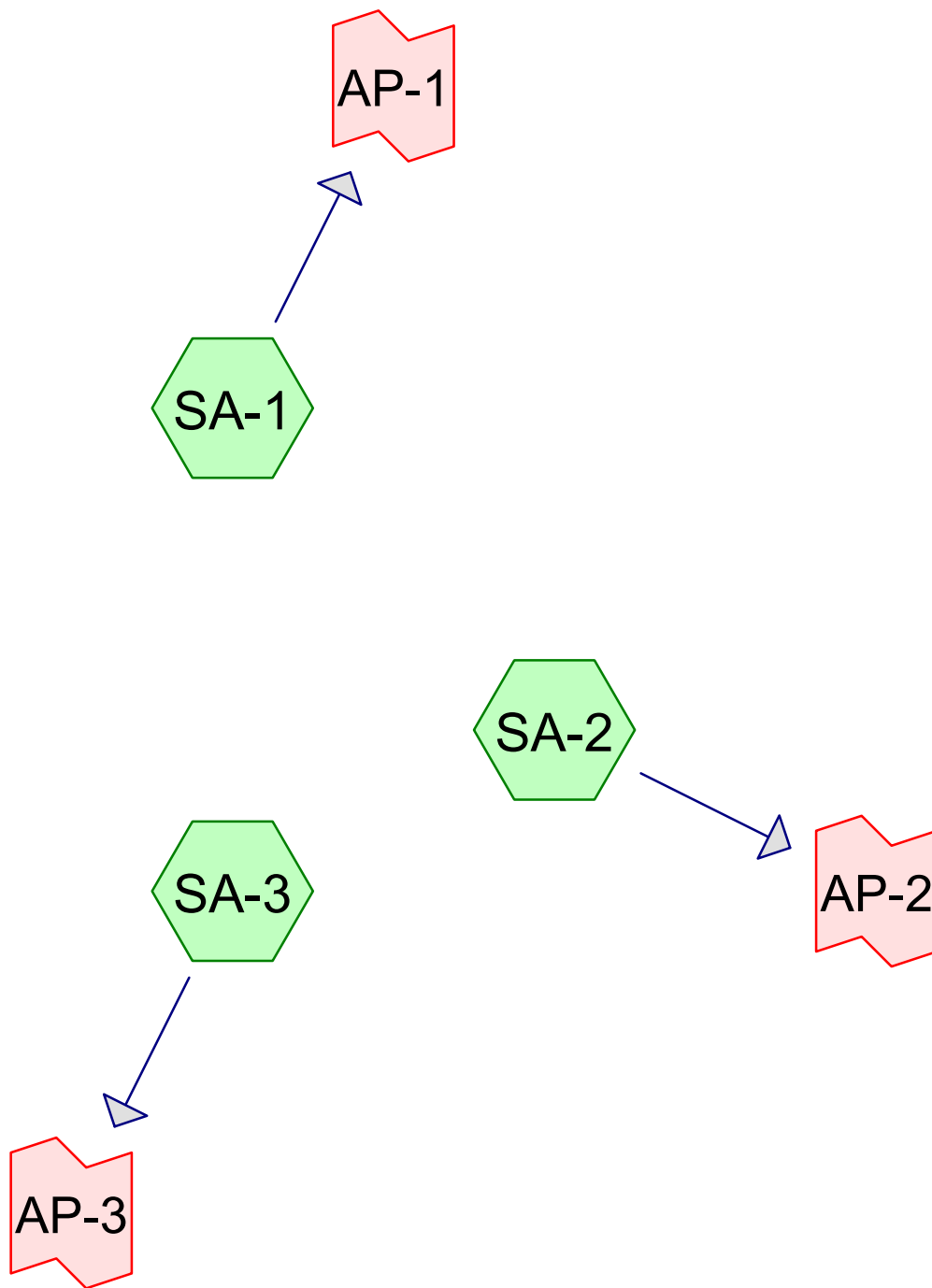
- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. September 18, 2002. Hydric soils of the United States.
- Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
- National Research Council. 1995. Wetlands: Characteristics and boundaries.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580
- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

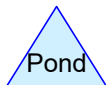
Appendix B
Pre Development Calculations



Subcat



Reach



Pond



Link

Routing Diagram for Pre-Development
Prepared by BH2M, Printed 5/7/2024
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Pre-Development

Prepared by BH2M

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Type III 24-hr 25-YR Rainfall=6.20"

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Page 2

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-1: Runoff Area=341,483 sf 0.00% Impervious Runoff Depth>3.21"
Flow Length=446' Tc=17.8 min CN=75 Runoff=22.36 cfs 2.096 af

Subcatchment SA-2: Runoff Area=290,295 sf 0.00% Impervious Runoff Depth>3.49"
Flow Length=660' Tc=26.9 min CN=78 Runoff=17.39 cfs 1.939 af

Subcatchment SA-3: Runoff Area=50,383 sf 0.00% Impervious Runoff Depth>3.02"
Flow Length=150' Slope=0.1067 '/' Tc=15.0 min CN=73 Runoff=3.32 cfs 0.291 af

Link AP-1: Inflow=22.36 cfs 2.096 af
Primary=22.36 cfs 2.096 af

Link AP-2: Inflow=17.39 cfs 1.939 af
Primary=17.39 cfs 1.939 af

Link AP-3: Inflow=3.32 cfs 0.291 af
Primary=3.32 cfs 0.291 af

Total Runoff Area = 15.660 ac Runoff Volume = 4.326 af Average Runoff Depth = 3.31"
100.00% Pervious = 15.660 ac 0.00% Impervious = 0.000 ac

Pre-Development

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Type III 24-hr 25-YR Rainfall=6.20"

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Summary for Subcatchment SA-1:

Runoff = 22.36 cfs @ 12.25 hrs, Volume= 2.096 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
115,270	70	Woods, Good, HSG C
17,262	77	Woods, Poor, HSG C
200,676	77	Woods, Good, HSG D
8,275	83	Woods, Poor, HSG D
341,483	75	Weighted Average
341,483		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	150	0.1067	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
2.8	296	0.1216	1.74		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
17.8	446	Total			

Summary for Subcatchment SA-2:

Runoff = 17.39 cfs @ 12.37 hrs, Volume= 1.939 af, Depth> 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
2,883	70	Woods, Good, HSG C
259,270	77	Woods, Good, HSG D
28,142	83	Woods, Poor, HSG D
290,295	78	Weighted Average
290,295		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.1	150	0.0667	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
8.8	510	0.0373	0.97		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
26.9	660	Total			

Pre-Development

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Type III 24-hr 25-YR Rainfall=6.20"

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Summary for Subcatchment SA-3:

Runoff = 3.32 cfs @ 12.21 hrs, Volume= 0.291 af, Depth> 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
34,989	70	Woods, Good, HSG C
3,545	77	Woods, Poor, HSG C
7,882	77	Woods, Good, HSG D
3,967	83	Woods, Poor, HSG D
50,383	73	Weighted Average
50,383		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	150	0.1067	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"

Summary for Link AP-1:

Inflow Area = 7.839 ac, 0.00% Impervious, Inflow Depth > 3.21" for 25-YR event
 Inflow = 22.36 cfs @ 12.25 hrs, Volume= 2.096 af
 Primary = 22.36 cfs @ 12.25 hrs, Volume= 2.096 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link AP-2:

Inflow Area = 6.664 ac, 0.00% Impervious, Inflow Depth > 3.49" for 25-YR event
 Inflow = 17.39 cfs @ 12.37 hrs, Volume= 1.939 af
 Primary = 17.39 cfs @ 12.37 hrs, Volume= 1.939 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link AP-3:

Inflow Area = 1.157 ac, 0.00% Impervious, Inflow Depth > 3.02" for 25-YR event
 Inflow = 3.32 cfs @ 12.21 hrs, Volume= 0.291 af
 Primary = 3.32 cfs @ 12.21 hrs, Volume= 0.291 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pre-Development

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Type III 24-hr 2-YR Rainfall=3.30"

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Page 1

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-1:

Runoff Area=341,483 sf 0.00% Impervious Runoff Depth>1.06"
Flow Length=446' Tc=17.8 min CN=75 Runoff=7.20 cfs 0.691 af

Subcatchment SA-2:

Runoff Area=290,295 sf 0.00% Impervious Runoff Depth>1.23"
Flow Length=660' Tc=26.9 min CN=78 Runoff=6.10 cfs 0.683 af

Subcatchment SA-3:

Runoff Area=50,383 sf 0.00% Impervious Runoff Depth>0.95"
Flow Length=150' Slope=0.1067 '/' Tc=15.0 min CN=73 Runoff=1.00 cfs 0.092 af

Link AP-1:

Inflow=7.20 cfs 0.691 af
Primary=7.20 cfs 0.691 af

Link AP-2:

Inflow=6.10 cfs 0.683 af
Primary=6.10 cfs 0.683 af

Link AP-3:

Inflow=1.00 cfs 0.092 af
Primary=1.00 cfs 0.092 af

Total Runoff Area = 15.660 ac Runoff Volume = 1.466 af Average Runoff Depth = 1.12"
100.00% Pervious = 15.660 ac 0.00% Impervious = 0.000 ac

Pre-Development

Prepared by BH2M

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Type III 24-hr 10-YR Rainfall=4.90"

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Page 2

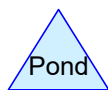
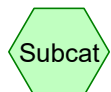
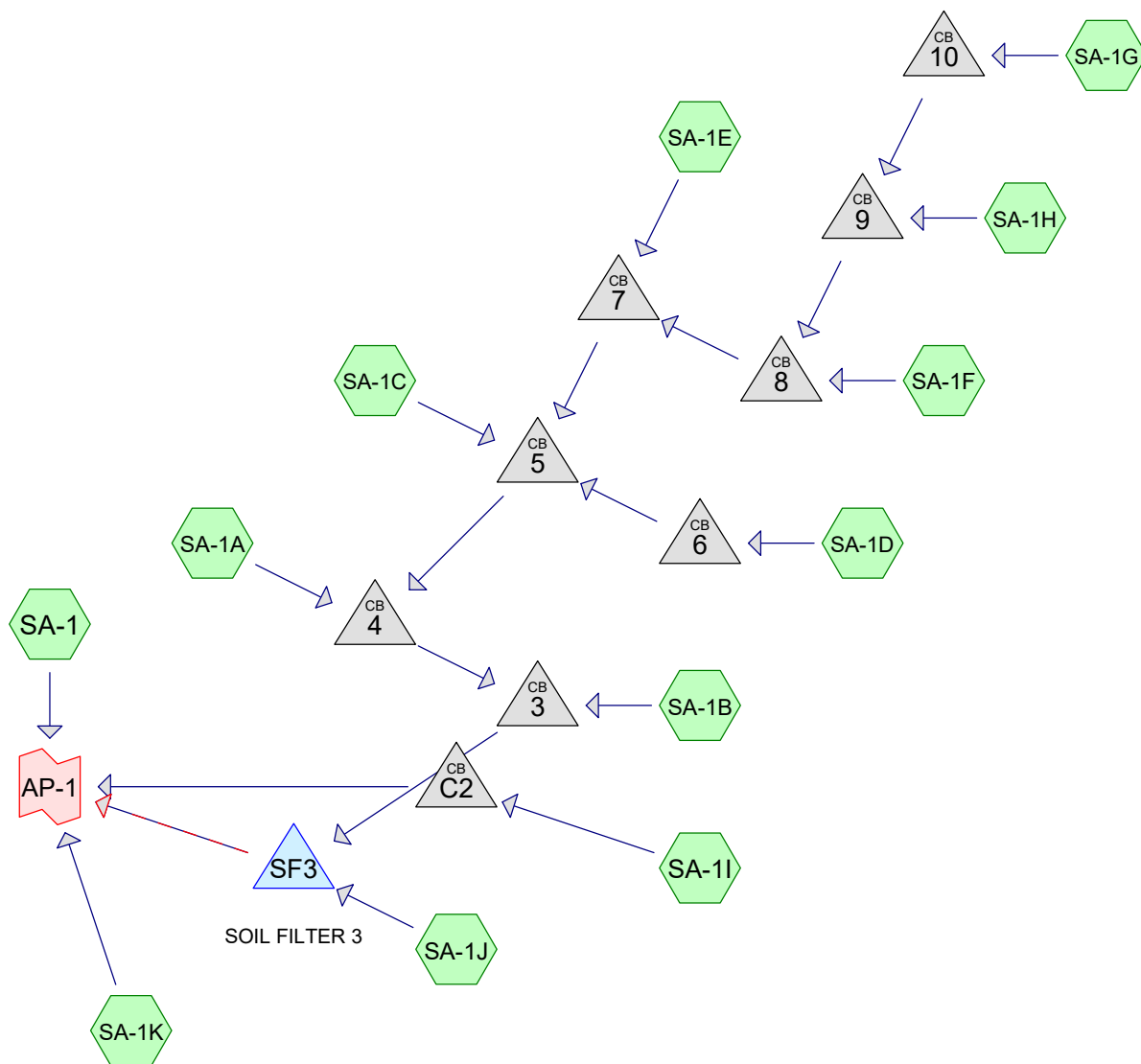
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Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-1:Runoff Area=341,483 sf 0.00% Impervious Runoff Depth>2.19"
Flow Length=446' Tc=17.8 min CN=75 Runoff=15.25 cfs 1.429 af**Subcatchment SA-2:**Runoff Area=290,295 sf 0.00% Impervious Runoff Depth>2.43"
Flow Length=660' Tc=26.9 min CN=78 Runoff=12.15 cfs 1.349 af**Subcatchment SA-3:**Runoff Area=50,383 sf 0.00% Impervious Runoff Depth>2.03"
Flow Length=150' Slope=0.1067 '/' Tc=15.0 min CN=73 Runoff=2.23 cfs 0.196 af**Link AP-1:**Inflow=15.25 cfs 1.429 af
Primary=15.25 cfs 1.429 af**Link AP-2:**Inflow=12.15 cfs 1.349 af
Primary=12.15 cfs 1.349 af**Link AP-3:**Inflow=2.23 cfs 0.196 af
Primary=2.23 cfs 0.196 af**Total Runoff Area = 15.660 ac Runoff Volume = 2.973 af Average Runoff Depth = 2.28"**
100.00% Pervious = 15.660 ac 0.00% Impervious = 0.000 ac

Appendix C
Post Development Calculations



Routing Diagram for Post-Development-AP-1
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Post-Development-AP-1

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Type III 24-hr 25-YR Rainfall=6.20"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-1: Runoff Area=268,518 sf 4.27% Impervious Runoff Depth>3.31"
Flow Length=446' Tc=17.8 min CN=76 Runoff=18.09 cfs 1.698 af

Subcatchment SA-1A: Runoff Area=816 sf 100.00% Impervious Runoff Depth>5.51"
Flow Length=98' Slope=0.0393 '/' Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af

Subcatchment SA-1B: Runoff Area=1,149 sf 100.00% Impervious Runoff Depth>5.51"
Flow Length=104' Slope=0.0365 '/' Tc=6.0 min CN=98 Runoff=0.16 cfs 0.012 af

Subcatchment SA-1C: Runoff Area=3,309 sf 100.00% Impervious Runoff Depth>5.51"
Flow Length=228' Tc=6.0 min CN=98 Runoff=0.45 cfs 0.035 af

Subcatchment SA-1D: Runoff Area=4,592 sf 100.00% Impervious Runoff Depth>5.51"
Flow Length=248' Tc=6.0 min CN=98 Runoff=0.63 cfs 0.048 af

Subcatchment SA-1E: Runoff Area=1,630 sf 88.83% Impervious Runoff Depth>5.27"
Flow Length=100' Slope=0.0130 '/' Tc=6.0 min CN=95 Runoff=0.22 cfs 0.016 af

Subcatchment SA-1F: Runoff Area=2,978 sf 91.91% Impervious Runoff Depth>5.36"
Flow Length=90' Slope=0.0122 '/' Tc=6.0 min CN=96 Runoff=0.40 cfs 0.031 af

Subcatchment SA-1G: Runoff Area=2,298 sf 100.00% Impervious Runoff Depth>5.51"
Flow Length=160' Tc=6.0 min CN=98 Runoff=0.31 cfs 0.024 af

Subcatchment SA-1H: Runoff Area=2,916 sf 100.00% Impervious Runoff Depth>5.51"
Flow Length=150' Slope=0.0371 '/' Tc=6.0 min CN=98 Runoff=0.40 cfs 0.031 af

Subcatchment SA-1I: Runoff Area=39,119 sf 25.56% Impervious Runoff Depth>4.02"
Flow Length=307' Tc=13.3 min CN=83 Runoff=3.49 cfs 0.301 af

Subcatchment SA-1J: Runoff Area=15,900 sf 0.00% Impervious Runoff Depth>3.21"
Flow Length=223' Tc=12.0 min CN=75 Runoff=1.21 cfs 0.098 af

Subcatchment SA-1K: Runoff Area=3,460 sf 0.00% Impervious Runoff Depth>2.93"
Tc=6.0 min CN=72 Runoff=0.29 cfs 0.019 af

Pond 3: Peak Elev=105.10' Inflow=2.67 cfs 0.206 af
15.0" Round Culvert n=0.013 L=19.0' S=0.0053 '/' Outflow=2.67 cfs 0.206 af

Pond 4: Peak Elev=105.18' Inflow=2.52 cfs 0.194 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0052 '/' Outflow=2.52 cfs 0.194 af

Pond 5: Peak Elev=106.38' Inflow=2.41 cfs 0.185 af
15.0" Round Culvert n=0.013 L=54.0' S=0.0256 '/' Outflow=2.41 cfs 0.185 af

Pond 6: Peak Elev=106.32' Inflow=0.63 cfs 0.048 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.63 cfs 0.048 af

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Pond 7: Peak Elev=110.86' Inflow=1.33 cfs 0.102 af
15.0" Round Culvert n=0.013 L=228.0' S=0.0202 '/' Outflow=1.33 cfs 0.102 af

Pond 8: Peak Elev=111.20' Inflow=1.11 cfs 0.085 af
15.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=1.11 cfs 0.085 af

Pond 9: Peak Elev=111.49' Inflow=0.71 cfs 0.055 af
15.0" Round Culvert n=0.013 L=25.0' S=0.0136 '/' Outflow=0.71 cfs 0.055 af

Pond 10: Peak Elev=111.70' Inflow=0.31 cfs 0.024 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.31 cfs 0.024 af

Pond C2: Peak Elev=107.64' Inflow=3.49 cfs 0.301 af
18.0" Round Culvert n=0.013 L=71.0' S=0.1007 '/' Outflow=3.49 cfs 0.301 af

Pond SF3: SOIL FILTER 3 Peak Elev=105.40' Storage=7,095 cf Inflow=3.66 cfs 0.304 af
Primary=0.75 cfs 0.220 af Secondary=0.00 cfs 0.000 af Outflow=0.75 cfs 0.220 af

Link AP-1: Inflow=22.08 cfs 2.238 af
Primary=22.08 cfs 2.238 af

Total Runoff Area = 7.959 ac Runoff Volume = 2.321 af Average Runoff Depth = 3.50"
88.25% Pervious = 7.023 ac 11.75% Impervious = 0.935 ac

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Type III 24-hr 25-YR Rainfall=6.20"

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Summary for Subcatchment SA-1:

Runoff = 18.09 cfs @ 12.25 hrs, Volume= 1.698 af, Depth> 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
54,450	70	Woods, Good, HSG C
195,029	77	Woods, Good, HSG D
7,365	74	>75% Grass cover, Good, HSG C
197	80	>75% Grass cover, Good, HSG D
* 10,000	98	Assumed Future Duplexes
* 1,477	98	Paved parking, HSG C PR Barra Road
268,518	76	Weighted Average
257,041		95.73% Pervious Area
11,477		4.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	150	0.1067	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
2.8	296	0.1216	1.74		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
17.8	446	Total			

Summary for Subcatchment SA-1A:

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
816	98	Paved parking, HSG A
816		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	98	0.0393	1.82		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.9	98	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-1B:

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 0.012 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

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Type III 24-hr 25-YR Rainfall=6.20"

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Area (sf)	CN	Description
1,149	98	Paved parking, HSG A
1,149		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	104	0.0365	1.79		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.0	104	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-1C:

Runoff = 0.45 cfs @ 12.09 hrs, Volume= 0.035 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
3,309	98	Paved parking, HSG A
3,309		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	150	0.0180	1.45		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.3	78	0.0365	3.88		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.0	228	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-1D:

Runoff = 0.63 cfs @ 12.09 hrs, Volume= 0.048 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
4,592	98	Paved parking, HSG A
4,592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	150	0.0153	1.36		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.4	98	0.0347	3.78		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.2	248	Total, Increased to minimum Tc = 6.0 min			

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Summary for Subcatchment SA-1E:

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.016 af, Depth> 5.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
1,448	98	Paved parking, HSG A
182	74	>75% Grass cover, Good, HSG C
1,630	95	Weighted Average
182		11.17% Pervious Area
1,448		88.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0130	1.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.4	100	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-1F:

Runoff = 0.40 cfs @ 12.09 hrs, Volume= 0.031 af, Depth> 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
2,737	98	Paved parking, HSG A
241	74	>75% Grass cover, Good, HSG C
2,978	96	Weighted Average
241		8.09% Pervious Area
2,737		91.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	90	0.0122	1.12		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.3	90	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-1G:

Runoff = 0.31 cfs @ 12.09 hrs, Volume= 0.024 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

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Type III 24-hr 25-YR Rainfall=6.20"

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Area (sf)	CN	Description
2,298	98	Paved parking, HSG A
2,298		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	150	0.0338	1.87		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.0	10	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.3	160	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-1H:

Runoff = 0.40 cfs @ 12.09 hrs, Volume= 0.031 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
2,916	98	Paved parking, HSG A
2,916		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	150	0.0371	1.94		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.3	150	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-1I:

Runoff = 3.49 cfs @ 12.18 hrs, Volume= 0.301 af, Depth> 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
6,738	77	Woods, Poor, HSG C
2,944	77	Woods, Good, HSG D
9,623	83	Woods, Poor, HSG D
7,804	74	>75% Grass cover, Good, HSG C
2,010	80	>75% Grass cover, Good, HSG D
* 10,000	98	Assumed Duplexes
39,119	83	Weighted Average
29,119		74.44% Pervious Area
10,000		25.56% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	150	0.1533	0.19		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.2	45	0.0444	3.16		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	112	0.0357	23.00	199.30	Parabolic Channel, W=6.50' D=2.00' Area=8.7 sf Perim=7.9' n= 0.013
13.3	307	Total			

Summary for Subcatchment SA-1J:

Runoff = 1.21 cfs @ 12.17 hrs, Volume= 0.098 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
998	70	Woods, Good, HSG C
8,127	77	Woods, Poor, HSG C
21	77	Woods, Good, HSG D
6,754	74	>75% Grass cover, Good, HSG C
15,900	75	Weighted Average
15,900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	150	0.1933	0.21		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.2	73	0.1986	6.68		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
12.0	223	Total			

Summary for Subcatchment SA-1K:

Runoff = 0.29 cfs @ 12.09 hrs, Volume= 0.019 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
1,632	74	>75% Grass cover, Good, HSG C
1,828	70	Woods, Good, HSG C
3,460	72	Weighted Average
3,460		100.00% Pervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Assumed Min.

Summary for Pond 3:

Inflow Area = 0.452 ac, 97.85% Impervious, Inflow Depth > 5.47" for 25-YR event
 Inflow = 2.67 cfs @ 12.09 hrs, Volume= 0.206 af
 Outflow = 2.67 cfs @ 12.09 hrs, Volume= 0.206 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.67 cfs @ 12.09 hrs, Volume= 0.206 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 105.10' @ 12.09 hrs

Flood Elev= 106.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	104.10'	15.0" Round Culvert L= 19.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 104.10' / 104.00' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.60 cfs @ 12.09 hrs HW=105.09' (Free Discharge)↑**1=Culvert** (Barrel Controls 2.60 cfs @ 3.44 fps)**Summary for Pond 4:**

Inflow Area = 0.426 ac, 97.72% Impervious, Inflow Depth > 5.46" for 25-YR event
 Inflow = 2.52 cfs @ 12.09 hrs, Volume= 0.194 af
 Outflow = 2.52 cfs @ 12.09 hrs, Volume= 0.194 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.52 cfs @ 12.09 hrs, Volume= 0.194 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 105.18' @ 12.09 hrs

Flood Elev= 107.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	104.22'	15.0" Round Culvert L= 23.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 104.22' / 104.10' S= 0.0052 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.45 cfs @ 12.09 hrs HW=105.17' (Free Discharge)↑**1=Culvert** (Barrel Controls 2.45 cfs @ 3.40 fps)**Summary for Pond 5:**

Inflow Area = 0.407 ac, 97.61% Impervious, Inflow Depth > 5.46" for 25-YR event
 Inflow = 2.41 cfs @ 12.09 hrs, Volume= 0.185 af
 Outflow = 2.41 cfs @ 12.09 hrs, Volume= 0.185 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.41 cfs @ 12.09 hrs, Volume= 0.185 af

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Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 106.38' @ 12.09 hrs

Flood Elev= 109.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	105.60'	15.0" Round Culvert L= 54.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.60' / 104.22' S= 0.0256 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.34 cfs @ 12.09 hrs HW=106.36' (Free Discharge)↑**1=Culvert** (Inlet Controls 2.34 cfs @ 2.98 fps)**Summary for Pond 6:**

Inflow Area = 0.105 ac, 100.00% Impervious, Inflow Depth > 5.51" for 25-YR event
Inflow = 0.63 cfs @ 12.09 hrs, Volume= 0.048 af
Outflow = 0.63 cfs @ 12.09 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.09 hrs, Volume= 0.048 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 106.32' @ 12.09 hrs

Flood Elev= 109.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	105.93'	15.0" Round Culvert L= 23.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.93' / 105.70' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.61 cfs @ 12.09 hrs HW=106.32' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.61 cfs @ 2.80 fps)**Summary for Pond 7:**

Inflow Area = 0.225 ac, 95.69% Impervious, Inflow Depth > 5.42" for 25-YR event
Inflow = 1.33 cfs @ 12.09 hrs, Volume= 0.102 af
Outflow = 1.33 cfs @ 12.09 hrs, Volume= 0.102 af, Atten= 0%, Lag= 0.0 min
Primary = 1.33 cfs @ 12.09 hrs, Volume= 0.102 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 110.86' @ 12.09 hrs

Flood Elev= 115.14'

Device	Routing	Invert	Outlet Devices
#1	Primary	110.31'	15.0" Round Culvert L= 228.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 110.31' / 105.70' S= 0.0202 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

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Primary OutFlow Max=1.29 cfs @ 12.09 hrs HW=110.86' (Free Discharge)↑**1=Culvert** (Inlet Controls 1.29 cfs @ 2.51 fps)**Summary for Pond 8:**

Inflow Area = 0.188 ac, 97.06% Impervious, Inflow Depth > 5.45" for 25-YR event
 Inflow = 1.11 cfs @ 12.09 hrs, Volume= 0.085 af
 Outflow = 1.11 cfs @ 12.09 hrs, Volume= 0.085 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.11 cfs @ 12.09 hrs, Volume= 0.085 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 111.20' @ 12.09 hrs

Flood Elev= 115.28'

Device	Routing	Invert	Outlet Devices
#1	Primary	110.66'	15.0" Round Culvert L= 25.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 110.66' / 110.41' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=1.08 cfs @ 12.09 hrs HW=111.19' (Free Discharge)↑**1=Culvert** (Barrel Controls 1.08 cfs @ 3.20 fps)**Summary for Pond 9:**

Inflow Area = 0.120 ac, 100.00% Impervious, Inflow Depth > 5.51" for 25-YR event
 Inflow = 0.71 cfs @ 12.09 hrs, Volume= 0.055 af
 Outflow = 0.71 cfs @ 12.09 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.71 cfs @ 12.09 hrs, Volume= 0.055 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 111.49' @ 12.09 hrs

Flood Elev= 115.87'

Device	Routing	Invert	Outlet Devices
#1	Primary	111.10'	15.0" Round Culvert L= 25.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 111.10' / 110.76' S= 0.0136 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.69 cfs @ 12.09 hrs HW=111.49' (Free Discharge)↑**1=Culvert** (Inlet Controls 0.69 cfs @ 2.12 fps)**Summary for Pond 10:**

Inflow Area = 0.053 ac, 100.00% Impervious, Inflow Depth > 5.51" for 25-YR event
 Inflow = 0.31 cfs @ 12.09 hrs, Volume= 0.024 af
 Outflow = 0.31 cfs @ 12.09 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.31 cfs @ 12.09 hrs, Volume= 0.024 af

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Type III 24-hr 25-YR Rainfall=6.20"

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Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 111.70' @ 12.09 hrs

Flood Elev= 115.67'

Device	Routing	Invert	Outlet Devices
#1	Primary	111.43'	15.0" Round Culvert L= 23.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 111.43' / 111.20' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.30 cfs @ 12.09 hrs HW=111.70' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.30 cfs @ 2.39 fps)**Summary for Pond C2:**

Inflow Area = 0.898 ac, 25.56% Impervious, Inflow Depth > 4.02" for 25-YR event
Inflow = 3.49 cfs @ 12.18 hrs, Volume= 0.301 af
Outflow = 3.49 cfs @ 12.18 hrs, Volume= 0.301 af, Atten= 0%, Lag= 0.0 min
Primary = 3.49 cfs @ 12.18 hrs, Volume= 0.301 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 107.64' @ 12.18 hrs

Flood Elev= 109.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	106.75'	18.0" Round Culvert L= 71.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 106.75' / 99.60' S= 0.1007 ' S= 0.1007 ' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=3.45 cfs @ 12.18 hrs HW=107.63' (Free Discharge)↑**1=Culvert** (Inlet Controls 3.45 cfs @ 3.20 fps)**Summary for Pond SF3: SOIL FILTER 3**

Inflow Area = 0.817 ac, 54.13% Impervious, Inflow Depth > 4.46" for 25-YR event
Inflow = 3.66 cfs @ 12.10 hrs, Volume= 0.304 af
Outflow = 0.75 cfs @ 12.59 hrs, Volume= 0.220 af, Atten= 80%, Lag= 29.5 min
Primary = 0.75 cfs @ 12.59 hrs, Volume= 0.220 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 105.40' @ 12.59 hrs Surf.Area= 4,476 sf Storage= 7,095 cf

Plug-Flow detention time= 161.9 min calculated for 0.219 af (72% of inflow)

Center-of-Mass det. time= 96.8 min (851.2 - 754.4)

Post-Development-AP-1

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Volume	Invert	Avail.Storage	Storage Description
#1	102.50'	8,466 cf	Custom Stage Data (Irregular) Listed below (Recalc)
#2	100.17'	628 cf	Custom Stage Data (Irregular) Listed below (Recalc)
			3,139 cf Overall x 20.0% Voids
			9,094 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.50	1,347	162.8	0	0	1,347
103.00	1,685	178.1	756	756	1,771
104.00	2,248	196.9	1,960	2,716	2,362
105.00	2,867	215.8	2,551	5,267	3,016
106.00	3,542	234.6	3,199	8,466	3,727

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
100.17	1,347	162.8	0	0	1,347
102.50	1,347	162.8	3,139	3,139	1,726

Device	Routing	Invert	Outlet Devices
#1	Device 4	104.00'	5.0" Vert. Orifice/Grate C= 0.600
#2	Device 3	100.17'	2.410 in/hr Exfiltration over Surface area
#3	Device 4	100.17'	0.7" Vert. Orifice/Grate C= 0.600
#4	Primary	100.17'	15.0" Round Culvert L= 20.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.17' / 100.07' S= 0.0050 ' S Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#5	Secondary	105.50'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.75 cfs @ 12.59 hrs HW=105.40' (Free Discharge)

4=Culvert (Passes 0.75 cfs of 12.68 cfs potential flow)
 1=Orifice/Grate (Orifice Controls 0.72 cfs @ 5.26 fps)
 3=Orifice/Grate (Orifice Controls 0.03 cfs @ 10.98 fps)
 2=Exfiltration (Passes 0.03 cfs of 0.25 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=100.18' (Free Discharge)

5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link AP-1:

Inflow Area = 7.959 ac, 11.75% Impervious, Inflow Depth > 3.37" for 25-YR event
 Inflow = 22.08 cfs @ 12.24 hrs, Volume= 2.238 af
 Primary = 22.08 cfs @ 12.24 hrs, Volume= 2.238 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Post-Development-AP-1

Type III 24-hr 2-YR Rainfall=3.30"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-1: Runoff Area=268,518 sf 4.27% Impervious Runoff Depth>1.12"
Flow Length=446' Tc=17.8 min CN=76 Runoff=6.01 cfs 0.573 af

Subcatchment SA-1A: Runoff Area=816 sf 100.00% Impervious Runoff Depth>2.87"
Flow Length=98' Slope=0.0393 '/' Tc=6.0 min CN=98 Runoff=0.06 cfs 0.004 af

Subcatchment SA-1B: Runoff Area=1,149 sf 100.00% Impervious Runoff Depth>2.87"
Flow Length=104' Slope=0.0365 '/' Tc=6.0 min CN=98 Runoff=0.08 cfs 0.006 af

Subcatchment SA-1C: Runoff Area=3,309 sf 100.00% Impervious Runoff Depth>2.87"
Flow Length=228' Tc=6.0 min CN=98 Runoff=0.24 cfs 0.018 af

Subcatchment SA-1D: Runoff Area=4,592 sf 100.00% Impervious Runoff Depth>2.87"
Flow Length=248' Tc=6.0 min CN=98 Runoff=0.33 cfs 0.025 af

Subcatchment SA-1E: Runoff Area=1,630 sf 88.83% Impervious Runoff Depth>2.59"
Flow Length=100' Slope=0.0130 '/' Tc=6.0 min CN=95 Runoff=0.11 cfs 0.008 af

Subcatchment SA-1F: Runoff Area=2,978 sf 91.91% Impervious Runoff Depth>2.69"
Flow Length=90' Slope=0.0122 '/' Tc=6.0 min CN=96 Runoff=0.21 cfs 0.015 af

Subcatchment SA-1G: Runoff Area=2,298 sf 100.00% Impervious Runoff Depth>2.87"
Flow Length=160' Tc=6.0 min CN=98 Runoff=0.17 cfs 0.013 af

Subcatchment SA-1H: Runoff Area=2,916 sf 100.00% Impervious Runoff Depth>2.87"
Flow Length=150' Slope=0.0371 '/' Tc=6.0 min CN=98 Runoff=0.21 cfs 0.016 af

Subcatchment SA-1I: Runoff Area=39,119 sf 25.56% Impervious Runoff Depth>1.57"
Flow Length=307' Tc=13.3 min CN=83 Runoff=1.39 cfs 0.117 af

Subcatchment SA-1J: Runoff Area=15,900 sf 0.00% Impervious Runoff Depth>1.06"
Flow Length=223' Tc=12.0 min CN=75 Runoff=0.39 cfs 0.032 af

Subcatchment SA-1K: Runoff Area=3,460 sf 0.00% Impervious Runoff Depth>0.90"
Tc=6.0 min CN=72 Runoff=0.08 cfs 0.006 af

Pond 3: Peak Elev=104.79' Inflow=1.40 cfs 0.106 af
15.0" Round Culvert n=0.013 L=19.0' S=0.0053 '/' Outflow=1.40 cfs 0.106 af

Pond 4: Peak Elev=104.88' Inflow=1.32 cfs 0.100 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0052 '/' Outflow=1.32 cfs 0.100 af

Pond 5: Peak Elev=106.14' Inflow=1.26 cfs 0.095 af
15.0" Round Culvert n=0.013 L=54.0' S=0.0256 '/' Outflow=1.26 cfs 0.095 af

Pond 6: Peak Elev=106.21' Inflow=0.33 cfs 0.025 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.33 cfs 0.025 af

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Type III 24-hr 2-YR Rainfall=3.30"

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Pond 7: Peak Elev=110.70' Inflow=0.69 cfs 0.052 af
15.0" Round Culvert n=0.013 L=228.0' S=0.0202 '/' Outflow=0.69 cfs 0.052 af

Pond 8: Peak Elev=111.04' Inflow=0.58 cfs 0.044 af
15.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=0.58 cfs 0.044 af

Pond 9: Peak Elev=111.38' Inflow=0.37 cfs 0.029 af
15.0" Round Culvert n=0.013 L=25.0' S=0.0136 '/' Outflow=0.37 cfs 0.029 af

Pond 10: Peak Elev=111.62' Inflow=0.17 cfs 0.013 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.17 cfs 0.013 af

Pond C2: Peak Elev=107.28' Inflow=1.39 cfs 0.117 af
18.0" Round Culvert n=0.013 L=71.0' S=0.1007 '/' Outflow=1.39 cfs 0.117 af

Pond SF3: SOIL FILTER 3 Peak Elev=104.21' Storage=3,838 cf Inflow=1.70 cfs 0.138 af
Primary=0.14 cfs 0.058 af Secondary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.058 af

Link AP-1: Inflow=7.34 cfs 0.754 af
Primary=7.34 cfs 0.754 af

Total Runoff Area = 7.959 ac Runoff Volume = 0.835 af Average Runoff Depth = 1.26"
88.25% Pervious = 7.023 ac 11.75% Impervious = 0.935 ac

Post-Development-AP-1

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Type III 24-hr 10-YR Rainfall=4.90"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-1: Runoff Area=268,518 sf 4.27% Impervious Runoff Depth>2.27"
Flow Length=446' Tc=17.8 min CN=76 Runoff=12.45 cfs 1.165 af

Subcatchment SA-1A: Runoff Area=816 sf 100.00% Impervious Runoff Depth>4.33"
Flow Length=98' Slope=0.0393 '/' Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment SA-1B: Runoff Area=1,149 sf 100.00% Impervious Runoff Depth>4.33"
Flow Length=104' Slope=0.0365 '/' Tc=6.0 min CN=98 Runoff=0.12 cfs 0.010 af

Subcatchment SA-1C: Runoff Area=3,309 sf 100.00% Impervious Runoff Depth>4.33"
Flow Length=228' Tc=6.0 min CN=98 Runoff=0.36 cfs 0.027 af

Subcatchment SA-1D: Runoff Area=4,592 sf 100.00% Impervious Runoff Depth>4.33"
Flow Length=248' Tc=6.0 min CN=98 Runoff=0.49 cfs 0.038 af

Subcatchment SA-1E: Runoff Area=1,630 sf 88.83% Impervious Runoff Depth>4.07"
Flow Length=100' Slope=0.0130 '/' Tc=6.0 min CN=95 Runoff=0.17 cfs 0.013 af

Subcatchment SA-1F: Runoff Area=2,978 sf 91.91% Impervious Runoff Depth>4.16"
Flow Length=90' Slope=0.0122 '/' Tc=6.0 min CN=96 Runoff=0.31 cfs 0.024 af

Subcatchment SA-1G: Runoff Area=2,298 sf 100.00% Impervious Runoff Depth>4.33"
Flow Length=160' Tc=6.0 min CN=98 Runoff=0.25 cfs 0.019 af

Subcatchment SA-1H: Runoff Area=2,916 sf 100.00% Impervious Runoff Depth>4.33"
Flow Length=150' Slope=0.0371 '/' Tc=6.0 min CN=98 Runoff=0.31 cfs 0.024 af

Subcatchment SA-1I: Runoff Area=39,119 sf 25.56% Impervious Runoff Depth>2.88"
Flow Length=307' Tc=13.3 min CN=83 Runoff=2.54 cfs 0.216 af

Subcatchment SA-1J: Runoff Area=15,900 sf 0.00% Impervious Runoff Depth>2.19"
Flow Length=223' Tc=12.0 min CN=75 Runoff=0.82 cfs 0.067 af

Subcatchment SA-1K: Runoff Area=3,460 sf 0.00% Impervious Runoff Depth>1.96"
Tc=6.0 min CN=72 Runoff=0.19 cfs 0.013 af

Pond 3: Peak Elev=104.97' Inflow=2.10 cfs 0.161 af
15.0" Round Culvert n=0.013 L=19.0' S=0.0053 '/' Outflow=2.10 cfs 0.161 af

Pond 4: Peak Elev=105.05' Inflow=1.98 cfs 0.152 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0052 '/' Outflow=1.98 cfs 0.152 af

Pond 5: Peak Elev=106.28' Inflow=1.89 cfs 0.145 af
15.0" Round Culvert n=0.013 L=54.0' S=0.0256 '/' Outflow=1.89 cfs 0.145 af

Pond 6: Peak Elev=106.28' Inflow=0.49 cfs 0.038 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.49 cfs 0.038 af

Post-Development-AP-1

Type III 24-hr 10-YR Rainfall=4.90"

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Pond 7: Peak Elev=110.80' Inflow=1.05 cfs 0.080 af
15.0" Round Culvert n=0.013 L=228.0' S=0.0202 '/' Outflow=1.05 cfs 0.080 af

Pond 8: Peak Elev=111.13' Inflow=0.87 cfs 0.067 af
15.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=0.87 cfs 0.067 af

Pond 9: Peak Elev=111.45' Inflow=0.56 cfs 0.043 af
15.0" Round Culvert n=0.013 L=25.0' S=0.0136 '/' Outflow=0.56 cfs 0.043 af

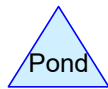
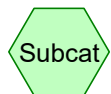
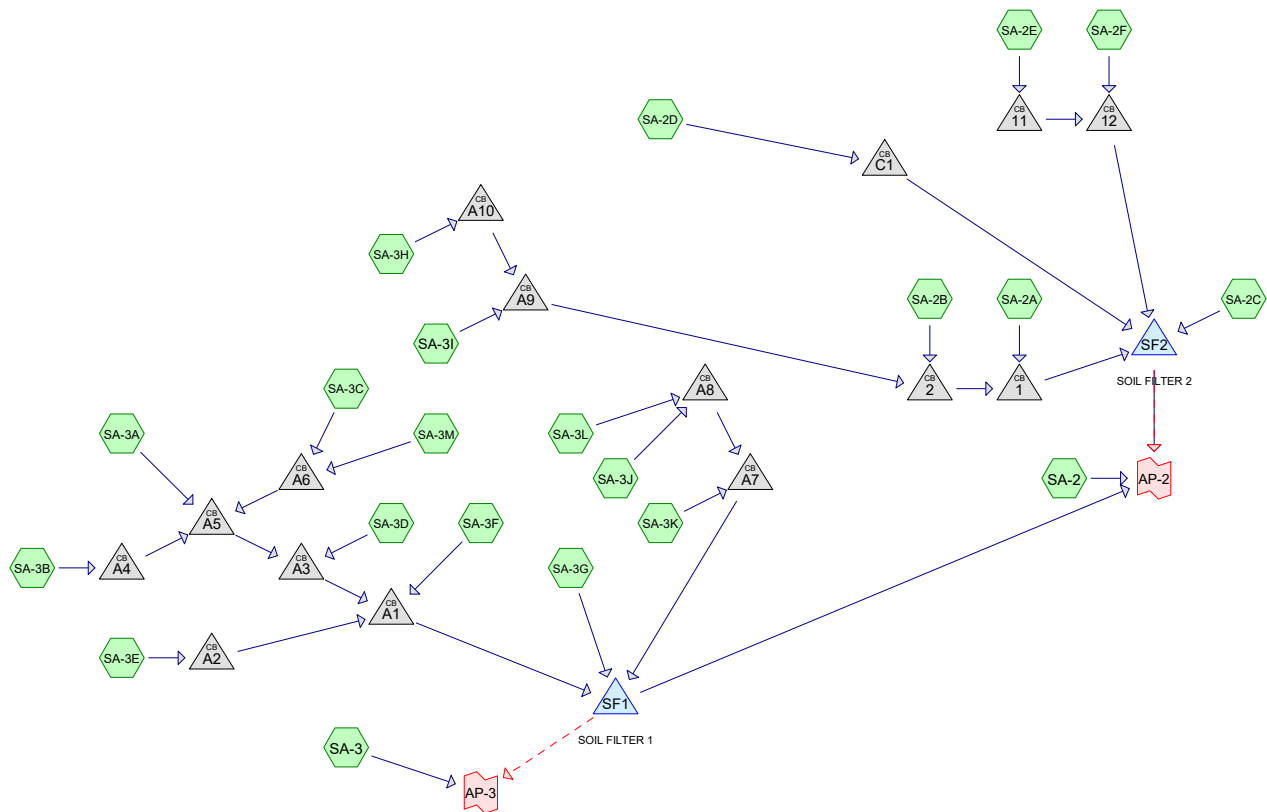
Pond 10: Peak Elev=111.67' Inflow=0.25 cfs 0.019 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.25 cfs 0.019 af

Pond C2: Peak Elev=107.49' Inflow=2.54 cfs 0.216 af
18.0" Round Culvert n=0.013 L=71.0' S=0.1007 '/' Outflow=2.54 cfs 0.216 af

Pond SF3: SOIL FILTER 3 Peak Elev=104.83' Storage=5,412 cf Inflow=2.77 cfs 0.228 af
Primary=0.54 cfs 0.146 af Secondary=0.00 cfs 0.000 af Outflow=0.54 cfs 0.146 af

Link AP-1: Inflow=15.28 cfs 1.540 af
Primary=15.28 cfs 1.540 af

Total Runoff Area = 7.959 ac Runoff Volume = 1.622 af Average Runoff Depth = 2.45"
88.25% Pervious = 7.023 ac 11.75% Impervious = 0.935 ac



Routing Diagram for Post-Development-AP-2 & 3
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Post-Development-AP-2 & 3

Type III 24-hr 25-YR Rainfall=6.20"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-2:	Runoff Area=209,759 sf 4.77% Impervious Runoff Depth>3.49" Flow Length=660' Tc=26.9 min CN=78 Runoff=12.57 cfs 1.401 af
Subcatchment SA-2A:	Runoff Area=2,804 sf 100.00% Impervious Runoff Depth>5.51" Flow Length=190' Tc=6.0 min CN=98 Runoff=0.38 cfs 0.030 af
Subcatchment SA-2B:	Runoff Area=3,586 sf 100.00% Impervious Runoff Depth>5.51" Flow Length=190' Tc=6.0 min CN=98 Runoff=0.49 cfs 0.038 af
Subcatchment SA-2C:	Runoff Area=3,954 sf 0.00% Impervious Runoff Depth>3.72" Flow Length=40' Slope=0.1750 '/' Tc=6.0 min CN=80 Runoff=0.41 cfs 0.028 af
Subcatchment SA-2D:	Runoff Area=23,916 sf 20.91% Impervious Runoff Depth>4.12" Flow Length=223' Tc=13.7 min CN=84 Runoff=2.16 cfs 0.188 af
Subcatchment SA-2E:	Runoff Area=888 sf 100.00% Impervious Runoff Depth>5.51" Tc=6.0 min CN=98 Runoff=0.12 cfs 0.009 af
Subcatchment SA-2F:	Runoff Area=782 sf 100.00% Impervious Runoff Depth>5.51" Tc=6.0 min CN=98 Runoff=0.11 cfs 0.008 af
Subcatchment SA-3:	Runoff Area=32,582 sf 0.00% Impervious Runoff Depth>3.02" Flow Length=108' Slope=0.0370 '/' Tc=17.6 min CN=73 Runoff=2.02 cfs 0.188 af
Subcatchment SA-3A:	Runoff Area=7,214 sf 90.84% Impervious Runoff Depth>5.36" Flow Length=102' Slope=0.0069 '/' Tc=6.0 min CN=96 Runoff=0.97 cfs 0.074 af
Subcatchment SA-3B:	Runoff Area=2,033 sf 100.00% Impervious Runoff Depth>5.51" Flow Length=82' Slope=0.0201 '/' Tc=6.0 min CN=98 Runoff=0.28 cfs 0.021 af
Subcatchment SA-3C:	Runoff Area=1,985 sf 4.33% Impervious Runoff Depth>3.82" Flow Length=40' Slope=0.0150 '/' Tc=6.0 min CN=81 Runoff=0.21 cfs 0.014 af
Subcatchment SA-3D:	Runoff Area=5,267 sf 100.00% Impervious Runoff Depth>5.51" Flow Length=81' Slope=0.0172 '/' Tc=6.0 min CN=98 Runoff=0.72 cfs 0.056 af
Subcatchment SA-3E:	Runoff Area=2,898 sf 100.00% Impervious Runoff Depth>5.51" Flow Length=80' Slope=0.0225 '/' Tc=6.0 min CN=98 Runoff=0.39 cfs 0.031 af
Subcatchment SA-3F:	Runoff Area=2,559 sf 93.86% Impervious Runoff Depth>5.44" Flow Length=60' Slope=0.0200 '/' Tc=6.0 min CN=97 Runoff=0.35 cfs 0.027 af
Subcatchment SA-3G:	Runoff Area=9,411 sf 0.00% Impervious Runoff Depth>3.42" Flow Length=60' Slope=0.0875 '/' Tc=6.0 min CN=77 Runoff=0.91 cfs 0.062 af
Subcatchment SA-3H:	Runoff Area=2,721 sf 100.00% Impervious Runoff Depth>5.51" Flow Length=211' Tc=6.0 min CN=98 Runoff=0.37 cfs 0.029 af

Post-Development-AP-2 & 3

Type III 24-hr 25-YR Rainfall=6.20"

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Subcatchment SA-3I: Runoff Area=8,561 sf 30.28% Impervious Runoff Depth>4.55"
Flow Length=150' Slope=0.0140 '/' Tc=6.0 min CN=88 Runoff=1.05 cfs 0.075 af

Subcatchment SA-3J: Runoff Area=2,569 sf 0.00% Impervious Runoff Depth>3.82"
Flow Length=48' Slope=0.0625 '/' Tc=6.0 min CN=81 Runoff=0.27 cfs 0.019 af

Subcatchment SA-3K: Runoff Area=1,602 sf 0.00% Impervious Runoff Depth>3.72"
Flow Length=33' Slope=0.0758 '/' Tc=6.0 min CN=80 Runoff=0.17 cfs 0.011 af

Subcatchment SA-3L: Runoff Area=4,848 sf 100.00% Impervious Runoff Depth>5.51"
Tc=6.0 min CN=98 Runoff=0.66 cfs 0.051 af

Subcatchment SA-3M: Runoff Area=5,537 sf 100.00% Impervious Runoff Depth>5.51"
Tc=6.0 min CN=98 Runoff=0.75 cfs 0.058 af

Pond 1: Peak Elev=113.01' Inflow=2.29 cfs 0.171 af
15.0" Round Culvert n=0.013 L=19.0' S=0.0053 '/' Outflow=2.29 cfs 0.171 af

Pond 2: Peak Elev=113.04' Inflow=1.91 cfs 0.141 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0052 '/' Outflow=1.91 cfs 0.141 af

Pond 11: Peak Elev=112.66' Inflow=0.12 cfs 0.009 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.12 cfs 0.009 af

Pond 12: Peak Elev=112.39' Inflow=0.23 cfs 0.018 af
15.0" Round Culvert n=0.013 L=16.0' S=0.0100 '/' Outflow=0.23 cfs 0.018 af

Pond A1: Peak Elev=115.36' Inflow=3.67 cfs 0.281 af
15.0" Round Culvert n=0.013 L=26.0' S=0.0050 '/' Outflow=3.67 cfs 0.281 af

Pond A10: Peak Elev=113.19' Inflow=0.37 cfs 0.029 af
15.0" Round Culvert n=0.013 L=16.0' S=0.0100 '/' Outflow=0.37 cfs 0.029 af

Pond A2: Peak Elev=114.78' Inflow=0.39 cfs 0.031 af
15.0" Round Culvert n=0.013 L=62.0' S=0.0050 '/' Outflow=0.39 cfs 0.031 af

Pond A3: Peak Elev=116.09' Inflow=2.93 cfs 0.224 af
15.0" Round Culvert n=0.013 L=41.0' S=0.0100 '/' Outflow=2.93 cfs 0.224 af

Pond A4: Peak Elev=116.56' Inflow=0.28 cfs 0.021 af
15.0" Round Culvert n=0.013 L=49.0' S=0.0051 '/' Outflow=0.28 cfs 0.021 af

Pond A5: Peak Elev=116.77' Inflow=2.21 cfs 0.168 af
15.0" Round Culvert n=0.013 L=77.0' S=0.0100 '/' Outflow=2.21 cfs 0.168 af

Pond A6: Peak Elev=116.94' Inflow=0.97 cfs 0.073 af
15.0" Round Culvert n=0.013 L=52.0' S=0.0050 '/' Outflow=0.97 cfs 0.073 af

Pond A7: Peak Elev=115.60' Inflow=1.10 cfs 0.081 af
15.0" Round Culvert n=0.013 L=52.0' S=0.0050 '/' Outflow=1.10 cfs 0.081 af

Post-Development-AP-2 & 3

Type III 24-hr 25-YR Rainfall=6.20"

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Pond A8: Peak Elev=115.84' Inflow=0.93 cfs 0.070 af
15.0" Round Culvert n=0.013 L=59.0' S=0.0051 '/' Outflow=0.93 cfs 0.070 af

Pond A9: Peak Elev=113.23' Inflow=1.42 cfs 0.103 af
15.0" Round Culvert n=0.013 L=41.0' S=0.0100 '/' Outflow=1.42 cfs 0.103 af

Pond C1: Peak Elev=116.59' Inflow=2.16 cfs 0.188 af
15.0" Round Culvert n=0.013 L=81.0' S=0.0463 '/' Outflow=2.16 cfs 0.188 af

Pond SF1: SOIL FILTER 1 Peak Elev=114.78' Storage=9,845 cf Inflow=5.68 cfs 0.424 af
Primary=1.31 cfs 0.269 af Secondary=0.15 cfs 0.002 af Outflow=1.45 cfs 0.271 af

Pond SF2: SOIL FILTER 2 Peak Elev=111.81' Storage=3,563 cf Inflow=4.66 cfs 0.405 af
Primary=4.50 cfs 0.337 af Secondary=0.00 cfs 0.000 af Outflow=4.50 cfs 0.337 af

Link AP-2: Inflow=16.57 cfs 2.008 af
Primary=16.57 cfs 2.008 af

Link AP-3: Inflow=2.02 cfs 0.190 af
Primary=2.02 cfs 0.190 af

Total Runoff Area = 7.701 ac Runoff Volume = 2.418 af Average Runoff Depth = 3.77"
82.71% Pervious = 6.370 ac 17.29% Impervious = 1.331 ac

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Type III 24-hr 25-YR Rainfall=6.20"

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Summary for Subcatchment SA-2:

Runoff = 12.57 cfs @ 12.37 hrs, Volume= 1.401 af, Depth> 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
183,385	77	Woods, Good, HSG D
16,374	80	>75% Grass cover, Good, HSG D
* 10,000	98	Assumed Duplexes
209,759	78	Weighted Average
199,759		95.23% Pervious Area
10,000		4.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.1	150	0.0667	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
8.8	510	0.0373	0.97		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
26.9	660	Total			

Summary for Subcatchment SA-2A:

Runoff = 0.38 cfs @ 12.09 hrs, Volume= 0.030 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
2,804	98	Paved parking, HSG A
2,804		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	150	0.0338	1.87		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.2	40	0.0375	3.93		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.5	190	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-2B:

Runoff = 0.49 cfs @ 12.09 hrs, Volume= 0.038 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

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Type III 24-hr 25-YR Rainfall=6.20"

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Area (sf)	CN	Description
3,586	98	Paved parking, HSG A
3,586		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	150	0.0338	1.87		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.2	40	0.0375	3.93		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.5	190	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-2C:

Runoff = 0.41 cfs @ 12.09 hrs, Volume= 0.028 af, Depth> 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
3,954	80	>75% Grass cover, Good, HSG D
3,954		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	40	0.1750	0.34		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
1.9	40	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-2D:

Runoff = 2.16 cfs @ 12.19 hrs, Volume= 0.188 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
* 4,951	83	Woods, Poor, HSG D (Subdivision)
* 1,919	80	>75% Grass cover, Good, HSG D (Subdivision)
* 5,000	98	Assumed Duplex (Subdivision)
* 5,099	77	Woods, Good, HSG D (Avesta)
* 6,947	80	>75% Grass cover, Good, HSG D (Avesta)
23,916	84	Weighted Average
18,916		79.09% Pervious Area
5,000		20.91% Impervious Area

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Type III 24-hr 25-YR Rainfall=6.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	150	0.1433	0.19		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.1	12	0.1433	1.89		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	61	0.0300	3.68	5.52	Trap/Vee/Rect Channel Flow, Bot.W=2.00' D=0.50' Z= 2.0 '/' Top.W=4.00' n= 0.035
13.7	223	Total			

Summary for Subcatchment SA-2E:

Runoff = 0.12 cfs @ 12.09 hrs, Volume= 0.009 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
888	98	Paved roads w/curbs & sewers, HSG D
888		100.00% Impervious Area

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

Summary for Subcatchment SA-2F:

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.008 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
782	98	Paved parking, HSG D
782		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Assumed Min.

Summary for Subcatchment SA-3:

Runoff = 2.02 cfs @ 12.25 hrs, Volume= 0.188 af, Depth> 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

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Type III 24-hr 25-YR Rainfall=6.20"

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Area (sf)	CN	Description
15,066	70	Woods, Good, HSG C
2,921	77	Woods, Poor, HSG C
6,644	77	Woods, Good, HSG D
530	83	Woods, Poor, HSG D
5,718	74	>75% Grass cover, Good, HSG C
1,703	80	>75% Grass cover, Good, HSG D
32,582	73	Weighted Average
32,582		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.6	108	0.0370	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"

Summary for Subcatchment SA-3A:

Runoff = 0.97 cfs @ 12.09 hrs, Volume= 0.074 af, Depth> 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
661	80	>75% Grass cover, Good, HSG D
6,553	98	Paved parking, HSG A
7,214	96	Weighted Average
661		9.16% Pervious Area
6,553		90.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	102	0.0069	0.92		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.9	102	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3B:

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.021 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
2,033	98	Paved parking, HSG A
2,033		100.00% Impervious Area

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Type III 24-hr 25-YR Rainfall=6.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	82	0.0201	1.35		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.0	82	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3C:

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.014 af, Depth> 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
1,899	80	>75% Grass cover, Good, HSG D
86	98	Paved parking, HSG A
1,985	81	Weighted Average
1,899		95.67% Pervious Area
86		4.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	40	0.0150	1.04		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.6	40	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3D:

Runoff = 0.72 cfs @ 12.09 hrs, Volume= 0.056 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
5,267	98	Paved parking, HSG A
5,267		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	81	0.0172	1.26		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.1	81	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3E:

Runoff = 0.39 cfs @ 12.09 hrs, Volume= 0.031 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

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Type III 24-hr 25-YR Rainfall=6.20"

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Area (sf)	CN	Description
2,898	98	Paved parking, HSG A
2,898		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	80	0.0225	1.40		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.0	80	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3F:

Runoff = 0.35 cfs @ 12.09 hrs, Volume= 0.027 af, Depth> 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
157	74	>75% Grass cover, Good, HSG C
2,402	98	Paved parking, HSG A
2,559	97	Weighted Average
157		6.14% Pervious Area
2,402		93.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	60	0.0200	1.26		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.8	60	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3G:

Runoff = 0.91 cfs @ 12.09 hrs, Volume= 0.062 af, Depth> 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
4,181	74	>75% Grass cover, Good, HSG C
5,230	80	>75% Grass cover, Good, HSG D
9,411	77	Weighted Average
9,411		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	60	0.0875	0.28		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
3.6	60	Total, Increased to minimum Tc = 6.0 min			

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Type III 24-hr 25-YR Rainfall=6.20"

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Summary for Subcatchment SA-3H:

Runoff = 0.37 cfs @ 12.09 hrs, Volume= 0.029 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
2,721	98	Paved parking, HSG A
2,721		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	150	0.0128	1.27		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
0.4	61	0.0156	2.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.4	211	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3I:

Runoff = 1.05 cfs @ 12.09 hrs, Volume= 0.075 af, Depth> 4.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
3,949	80	>75% Grass cover, Good, HSG D
2,020	91	Gravel roads, HSG D
2,592	98	Paved parking, HSG A
8,561	88	Weighted Average
5,969		69.72% Pervious Area
2,592		30.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0140	1.31		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.30"
1.9	150	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3J:

Runoff = 0.27 cfs @ 12.09 hrs, Volume= 0.019 af, Depth> 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

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Type III 24-hr 25-YR Rainfall=6.20"

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Area (sf)	CN	Description
2,334	80	>75% Grass cover, Good, HSG D
235	91	Gravel roads, HSG D
2,569	81	Weighted Average
2,569		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	48	0.0625	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
3.4	48	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3K:

Runoff = 0.17 cfs @ 12.09 hrs, Volume= 0.011 af, Depth> 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
1,602	80	>75% Grass cover, Good, HSG D
1,602		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	33	0.0758	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
2.3	33	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3L:

Runoff = 0.66 cfs @ 12.09 hrs, Volume= 0.051 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
4,848	98	Roofs, HSG A
4,848		100.00% Impervious Area

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

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Type III 24-hr 25-YR Rainfall=6.20"

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Summary for Subcatchment SA-3M:

Runoff = 0.75 cfs @ 12.09 hrs, Volume= 0.058 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
5,537	98	Roofs, HSG A
5,537		100.00% Impervious Area

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

Summary for Pond 1:

Inflow Area = 0.406 ac, 66.22% Impervious, Inflow Depth > 5.05" for 25-YR event
 Inflow = 2.29 cfs @ 12.09 hrs, Volume= 0.171 af
 Outflow = 2.29 cfs @ 12.09 hrs, Volume= 0.171 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.29 cfs @ 12.09 hrs, Volume= 0.171 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 113.01' @ 12.09 hrs
 Flood Elev= 115.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.10'	15.0" Round Culvert L= 19.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 112.10' / 112.00' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.23 cfs @ 12.09 hrs HW=113.00' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 2.23 cfs @ 3.30 fps)

Summary for Pond 2:

Inflow Area = 0.341 ac, 59.85% Impervious, Inflow Depth > 4.96" for 25-YR event
 Inflow = 1.91 cfs @ 12.09 hrs, Volume= 0.141 af
 Outflow = 1.91 cfs @ 12.09 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.91 cfs @ 12.09 hrs, Volume= 0.141 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 113.04' @ 12.09 hrs
 Flood Elev= 115.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.22'	15.0" Round Culvert L= 23.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 112.22' / 112.10' S= 0.0052 '/' Cc= 0.900

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Type III 24-hr 25-YR Rainfall=6.20"

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n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=1.86 cfs @ 12.09 hrs HW=113.02' (Free Discharge)↑**1=Culvert** (Barrel Controls 1.86 cfs @ 3.17 fps)**Summary for Pond 11:**

Inflow Area = 0.020 ac, 100.00% Impervious, Inflow Depth > 5.51" for 25-YR event
Inflow = 0.12 cfs @ 12.09 hrs, Volume= 0.009 af
Outflow = 0.12 cfs @ 12.09 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min
Primary = 0.12 cfs @ 12.09 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 112.66' @ 12.09 hrs

Flood Elev= 115.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.49'	15.0" Round Culvert L= 23.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 112.49' / 112.26' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.12 cfs @ 12.09 hrs HW=112.65' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.12 cfs @ 1.89 fps)**Summary for Pond 12:**

Inflow Area = 0.038 ac, 100.00% Impervious, Inflow Depth > 5.51" for 25-YR event
Inflow = 0.23 cfs @ 12.09 hrs, Volume= 0.018 af
Outflow = 0.23 cfs @ 12.09 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min
Primary = 0.23 cfs @ 12.09 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 112.39' @ 12.09 hrs

Flood Elev= 115.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.16'	15.0" Round Culvert L= 16.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 112.16' / 112.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.22 cfs @ 12.09 hrs HW=112.39' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.22 cfs @ 2.15 fps)

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Type III 24-hr 25-YR Rainfall=6.20"

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Summary for Pond A1:

Inflow Area = 0.631 ac, 90.12% Impervious, Inflow Depth > 5.34" for 25-YR event
 Inflow = 3.67 cfs @ 12.09 hrs, Volume= 0.281 af
 Outflow = 3.67 cfs @ 12.09 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.67 cfs @ 12.09 hrs, Volume= 0.281 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 115.36' @ 12.09 hrs

Flood Elev= 118.31'

Device	Routing	Invert	Outlet Devices
#1	Primary	114.13'	15.0" Round Culvert L= 26.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 114.13' / 114.00' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.58 cfs @ 12.09 hrs HW=115.34' (Free Discharge)↑**1=Culvert** (Barrel Controls 3.58 cfs @ 3.75 fps)**Summary for Pond A10:**

Inflow Area = 0.062 ac, 100.00% Impervious, Inflow Depth > 5.51" for 25-YR event
 Inflow = 0.37 cfs @ 12.09 hrs, Volume= 0.029 af
 Outflow = 0.37 cfs @ 12.09 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.37 cfs @ 12.09 hrs, Volume= 0.029 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 113.19' @ 12.09 hrs

Flood Elev= 117.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.89'	15.0" Round Culvert L= 16.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 112.89' / 112.73' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.36 cfs @ 12.09 hrs HW=113.19' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.36 cfs @ 2.40 fps)**Summary for Pond A2:**

Inflow Area = 0.067 ac, 100.00% Impervious, Inflow Depth > 5.51" for 25-YR event
 Inflow = 0.39 cfs @ 12.09 hrs, Volume= 0.031 af
 Outflow = 0.39 cfs @ 12.09 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.39 cfs @ 12.09 hrs, Volume= 0.031 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 114.78' @ 12.09 hrs

Flood Elev= 118.22'

Post-Development-AP-2 & 3

Type III 24-hr 25-YR Rainfall=6.20"

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Device	Routing	Invert	Outlet Devices
#1	Primary	114.44'	15.0" Round Culvert L= 62.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 114.44' / 114.13' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.38 cfs @ 12.09 hrs HW=114.77' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.38 cfs @ 2.19 fps)**Summary for Pond A3:**

Inflow Area = 0.506 ac, 88.38% Impervious, Inflow Depth > 5.31" for 25-YR event
Inflow = 2.93 cfs @ 12.09 hrs, Volume= 0.224 af
Outflow = 2.93 cfs @ 12.09 hrs, Volume= 0.224 af, Atten= 0%, Lag= 0.0 min
Primary = 2.93 cfs @ 12.09 hrs, Volume= 0.224 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 116.09' @ 12.09 hrs

Flood Elev= 119.21'

Device	Routing	Invert	Outlet Devices
#1	Primary	115.16'	15.0" Round Culvert L= 41.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 115.16' / 114.75' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.85 cfs @ 12.09 hrs HW=116.07' (Free Discharge)↑**1=Culvert** (Barrel Controls 2.85 cfs @ 4.15 fps)**Summary for Pond A4:**

Inflow Area = 0.047 ac, 100.00% Impervious, Inflow Depth > 5.51" for 25-YR event
Inflow = 0.28 cfs @ 12.09 hrs, Volume= 0.021 af
Outflow = 0.28 cfs @ 12.09 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 12.09 hrs, Volume= 0.021 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 116.56' @ 12.09 hrs

Flood Elev= 119.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	116.28'	15.0" Round Culvert L= 49.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 116.28' / 116.03' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.27 cfs @ 12.09 hrs HW=116.56' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.27 cfs @ 1.98 fps)

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Type III 24-hr 25-YR Rainfall=6.20"

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Summary for Pond A5:

Inflow Area = 0.385 ac, 84.73% Impervious, Inflow Depth > 5.24" for 25-YR event
 Inflow = 2.21 cfs @ 12.09 hrs, Volume= 0.168 af
 Outflow = 2.21 cfs @ 12.09 hrs, Volume= 0.168 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.21 cfs @ 12.09 hrs, Volume= 0.168 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 116.77' @ 12.09 hrs

Flood Elev= 119.86'

Device	Routing	Invert	Outlet Devices
#1	Primary	116.03'	15.0" Round Culvert L= 77.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 116.03' / 115.26' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.15 cfs @ 12.09 hrs HW=116.76' (Free Discharge)↑**1=Culvert** (Barrel Controls 2.15 cfs @ 4.17 fps)**Summary for Pond A6:**

Inflow Area = 0.173 ac, 74.75% Impervious, Inflow Depth > 5.06" for 25-YR event
 Inflow = 0.97 cfs @ 12.09 hrs, Volume= 0.073 af
 Outflow = 0.97 cfs @ 12.09 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.97 cfs @ 12.09 hrs, Volume= 0.073 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 116.94' @ 12.09 hrs

Flood Elev= 120.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	116.39'	15.0" Round Culvert L= 52.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 116.39' / 116.13' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.94 cfs @ 12.09 hrs HW=116.93' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.94 cfs @ 2.75 fps)**Summary for Pond A7:**

Inflow Area = 0.207 ac, 53.75% Impervious, Inflow Depth > 4.71" for 25-YR event
 Inflow = 1.10 cfs @ 12.09 hrs, Volume= 0.081 af
 Outflow = 1.10 cfs @ 12.09 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.10 cfs @ 12.09 hrs, Volume= 0.081 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 115.60' @ 12.09 hrs

Flood Elev= 118.50'

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Device	Routing	Invert	Outlet Devices
#1	Primary	115.01'	15.0" Round Culvert L= 52.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 115.01' / 114.75' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=1.07 cfs @ 12.09 hrs HW=115.59' (Free Discharge)↑**1=Culvert** (Barrel Controls 1.07 cfs @ 2.84 fps)**Summary for Pond A8:**

Inflow Area = 0.170 ac, 65.36% Impervious, Inflow Depth > 4.92" for 25-YR event
Inflow = 0.93 cfs @ 12.09 hrs, Volume= 0.070 af
Outflow = 0.93 cfs @ 12.09 hrs, Volume= 0.070 af, Atten= 0%, Lag= 0.0 min
Primary = 0.93 cfs @ 12.09 hrs, Volume= 0.070 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 115.84' @ 12.09 hrs

Flood Elev= 118.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	115.31'	15.0" Round Culvert L= 59.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 115.31' / 115.01' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.91 cfs @ 12.09 hrs HW=115.83' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.91 cfs @ 2.75 fps)**Summary for Pond A9:**

Inflow Area = 0.259 ac, 47.09% Impervious, Inflow Depth > 4.78" for 25-YR event
Inflow = 1.42 cfs @ 12.09 hrs, Volume= 0.103 af
Outflow = 1.42 cfs @ 12.09 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min
Primary = 1.42 cfs @ 12.09 hrs, Volume= 0.103 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 113.23' @ 12.09 hrs

Flood Elev= 117.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.63'	15.0" Round Culvert L= 41.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 112.63' / 112.22' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=1.38 cfs @ 12.09 hrs HW=113.22' (Free Discharge)↑**1=Culvert** (Barrel Controls 1.38 cfs @ 3.56 fps)

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Summary for Pond C1:

Inflow Area = 0.549 ac, 20.91% Impervious, Inflow Depth > 4.12" for 25-YR event
 Inflow = 2.16 cfs @ 12.19 hrs, Volume= 0.188 af
 Outflow = 2.16 cfs @ 12.19 hrs, Volume= 0.188 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.16 cfs @ 12.19 hrs, Volume= 0.188 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 116.59' @ 12.19 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	115.75'	15.0" Round Culvert L= 81.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 115.75' / 112.00' S= 0.0463 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.14 cfs @ 12.19 hrs HW=116.58' (Free Discharge)
 ↑**1=Culvert** (Inlet Controls 2.14 cfs @ 2.46 fps)

Summary for Pond SF1: SOIL FILTER 1

Inflow Area = 1.054 ac, 64.51% Impervious, Inflow Depth > 4.82" for 25-YR event
 Inflow = 5.68 cfs @ 12.09 hrs, Volume= 0.424 af
 Outflow = 1.45 cfs @ 12.46 hrs, Volume= 0.271 af, Atten= 74%, Lag= 22.5 min
 Primary = 1.31 cfs @ 12.46 hrs, Volume= 0.269 af
 Secondary = 0.15 cfs @ 12.46 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 114.78' @ 12.46 hrs Surf.Area= 7,456 sf Storage= 9,845 cf

Plug-Flow detention time= 161.3 min calculated for 0.271 af (64% of inflow)
 Center-of-Mass det. time= 85.9 min (833.1 - 747.2)

Volume	Invert	Avail.Storage	Storage Description
#1	112.50'	10,898 cf	Custom Stage Data (Irregular) Listed below (Recalc)
#2	110.17'	1,270 cf	Custom Stage Data (Irregular) Listed below (Recalc)
		6,349 cf Overall	x 20.0% Voids
		12,168 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
112.50	2,725	238.7	0	0	2,725
113.00	3,260	258.8	1,494	1,494	3,530
114.00	4,065	277.7	3,655	5,149	4,381
114.75	4,705	291.8	3,286	8,435	5,054
115.00	4,926	296.5	1,204	9,639	5,286
115.25	5,150	301.2	1,259	10,898	5,522

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Type III 24-hr 25-YR Rainfall=6.20"

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
110.17	2,725	238.7	0	0	2,725
112.50	2,725	238.7	6,349	6,349	3,281

Device	Routing	Invert	Outlet Devices
#1	Device 4	114.00'	12.0" W x 4.0" H Vert. Orifice/Grate C= 0.600
#2	Device 3	110.17'	2.410 in/hr Exfiltration over Surface area
#3	Device 4	110.17'	1.0" Vert. Orifice/Grate C= 0.600
#4	Primary	110.17'	15.0" Round Culvert L= 22.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 110.17' / 110.06' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#5	Secondary	114.75'	10.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=1.31 cfs @ 12.46 hrs HW=114.78' (Free Discharge)

4=Culvert (Passes 1.31 cfs of 11.79 cfs potential flow)
 1=Orifice/Grate (Orifice Controls 1.25 cfs @ 3.76 fps)
 3=Orifice/Grate (Orifice Controls 0.06 cfs @ 10.29 fps)
 2=Exfiltration (Passes 0.06 cfs of 0.42 cfs potential flow)

Secondary OutFlow Max=0.12 cfs @ 12.46 hrs HW=114.78' (Free Discharge)

5=Broad-Crested Rectangular Weir (Weir Controls 0.12 cfs @ 0.40 fps)

Summary for Pond SF2: SOIL FILTER 2

Inflow Area = 1.084 ac, 38.92% Impervious, Inflow Depth > 4.48" for 25-YR event
 Inflow = 4.66 cfs @ 12.11 hrs, Volume= 0.405 af
 Outflow = 4.50 cfs @ 12.15 hrs, Volume= 0.337 af, Atten= 3%, Lag= 2.1 min
 Primary = 4.50 cfs @ 12.15 hrs, Volume= 0.337 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 111.81' @ 12.15 hrs Surf.Area= 3,315 sf Storage= 3,563 cf

Plug-Flow detention time= 82.0 min calculated for 0.336 af (83% of inflow)

Center-of-Mass det. time= 35.0 min (797.0 - 762.0)

Volume	Invert	Avail.Storage	Storage Description
#1	110.00'	4,696 cf	Custom Stage Data (Irregular) Listed below (Recalc)
#2	107.67'	521 cf	Custom Stage Data (Irregular) Listed below (Recalc)
			2,603 cf Overall x 20.0% Voids
			5,217 cf Total Available Storage

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Type III 24-hr 25-YR Rainfall=6.20"

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
110.00	1,117	149.0	0	0	1,117
111.00	1,784	163.6	1,438	1,438	1,512
112.00	2,303	182.5	2,038	3,476	2,061
112.50	2,583	191.9	1,221	4,696	2,356

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
107.67	1,117	149.0	0	0	1,117
110.00	1,117	149.0	2,603	2,603	1,464

Device	Routing	Invert	Outlet Devices
#1	Device 4	111.50'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Device 3	107.67'	2.410 in/hr Exfiltration over Surface area
#3	Device 4	107.67'	0.7" Vert. Orifice/Grate C= 0.600
#4	Primary	107.67'	15.0" Round Culvert L= 37.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 107.67' / 106.00' S= 0.0451 ' S= 0.0451 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#5	Secondary	112.00'	10.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=4.47 cfs @ 12.15 hrs HW=111.81' (Free Discharge)

↑ **4=Culvert** (Passes 4.47 cfs of 11.07 cfs potential flow)
 ↑ **1=Orifice/Grate** (Weir Controls 4.44 cfs @ 1.81 fps)
 ↑ **3=Orifice/Grate** (Orifice Controls 0.03 cfs @ 9.76 fps)
 ↑ **2=Exfiltration** (Passes 0.03 cfs of 0.18 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=107.68' (Free Discharge)

↑ **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link AP-2:

Inflow Area = 6.953 ac, 19.15% Impervious, Inflow Depth > 3.47" for 25-YR event
 Inflow = 16.57 cfs @ 12.34 hrs, Volume= 2.008 af
 Primary = 16.57 cfs @ 12.34 hrs, Volume= 2.008 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link AP-3:

Inflow Area = 0.748 ac, 0.00% Impervious, Inflow Depth > 3.05" for 25-YR event
 Inflow = 2.02 cfs @ 12.25 hrs, Volume= 0.190 af
 Primary = 2.02 cfs @ 12.25 hrs, Volume= 0.190 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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Type III 24-hr 2-YR Rainfall=3.30"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-2:	Runoff Area=209,759 sf 4.77% Impervious Runoff Depth>1.23" Flow Length=660' Tc=26.9 min CN=78 Runoff=4.41 cfs 0.494 af
Subcatchment SA-2A:	Runoff Area=2,804 sf 100.00% Impervious Runoff Depth>2.87" Flow Length=190' Tc=6.0 min CN=98 Runoff=0.20 cfs 0.015 af
Subcatchment SA-2B:	Runoff Area=3,586 sf 100.00% Impervious Runoff Depth>2.87" Flow Length=190' Tc=6.0 min CN=98 Runoff=0.26 cfs 0.020 af
Subcatchment SA-2C:	Runoff Area=3,954 sf 0.00% Impervious Runoff Depth>1.37" Flow Length=40' Slope=0.1750 '/' Tc=6.0 min CN=80 Runoff=0.15 cfs 0.010 af
Subcatchment SA-2D:	Runoff Area=23,916 sf 20.91% Impervious Runoff Depth>1.64" Flow Length=223' Tc=13.7 min CN=84 Runoff=0.88 cfs 0.075 af
Subcatchment SA-2E:	Runoff Area=888 sf 100.00% Impervious Runoff Depth>2.87" Tc=6.0 min CN=98 Runoff=0.06 cfs 0.005 af
Subcatchment SA-2F:	Runoff Area=782 sf 100.00% Impervious Runoff Depth>2.87" Tc=6.0 min CN=98 Runoff=0.06 cfs 0.004 af
Subcatchment SA-3:	Runoff Area=32,582 sf 0.00% Impervious Runoff Depth>0.95" Flow Length=108' Slope=0.0370 '/' Tc=17.6 min CN=73 Runoff=0.61 cfs 0.059 af
Subcatchment SA-3A:	Runoff Area=7,214 sf 90.84% Impervious Runoff Depth>2.69" Flow Length=102' Slope=0.0069 '/' Tc=6.0 min CN=96 Runoff=0.50 cfs 0.037 af
Subcatchment SA-3B:	Runoff Area=2,033 sf 100.00% Impervious Runoff Depth>2.87" Flow Length=82' Slope=0.0201 '/' Tc=6.0 min CN=98 Runoff=0.15 cfs 0.011 af
Subcatchment SA-3C:	Runoff Area=1,985 sf 4.33% Impervious Runoff Depth>1.43" Flow Length=40' Slope=0.0150 '/' Tc=6.0 min CN=81 Runoff=0.08 cfs 0.005 af
Subcatchment SA-3D:	Runoff Area=5,267 sf 100.00% Impervious Runoff Depth>2.87" Flow Length=81' Slope=0.0172 '/' Tc=6.0 min CN=98 Runoff=0.38 cfs 0.029 af
Subcatchment SA-3E:	Runoff Area=2,898 sf 100.00% Impervious Runoff Depth>2.87" Flow Length=80' Slope=0.0225 '/' Tc=6.0 min CN=98 Runoff=0.21 cfs 0.016 af
Subcatchment SA-3F:	Runoff Area=2,559 sf 93.86% Impervious Runoff Depth>2.78" Flow Length=60' Slope=0.0200 '/' Tc=6.0 min CN=97 Runoff=0.18 cfs 0.014 af
Subcatchment SA-3G:	Runoff Area=9,411 sf 0.00% Impervious Runoff Depth>1.18" Flow Length=60' Slope=0.0875 '/' Tc=6.0 min CN=77 Runoff=0.31 cfs 0.021 af
Subcatchment SA-3H:	Runoff Area=2,721 sf 100.00% Impervious Runoff Depth>2.87" Flow Length=211' Tc=6.0 min CN=98 Runoff=0.20 cfs 0.015 af

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Type III 24-hr 2-YR Rainfall=3.30"

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Subcatchment SA-3I:	Runoff Area=8,561 sf 30.28% Impervious Runoff Depth>1.96" Flow Length=150' Slope=0.0140 '/' Tc=6.0 min CN=88 Runoff=0.47 cfs 0.032 af
Subcatchment SA-3J:	Runoff Area=2,569 sf 0.00% Impervious Runoff Depth>1.43" Flow Length=48' Slope=0.0625 '/' Tc=6.0 min CN=81 Runoff=0.10 cfs 0.007 af
Subcatchment SA-3K:	Runoff Area=1,602 sf 0.00% Impervious Runoff Depth>1.37" Flow Length=33' Slope=0.0758 '/' Tc=6.0 min CN=80 Runoff=0.06 cfs 0.004 af
Subcatchment SA-3L:	Runoff Area=4,848 sf 100.00% Impervious Runoff Depth>2.87" Tc=6.0 min CN=98 Runoff=0.35 cfs 0.027 af
Subcatchment SA-3M:	Runoff Area=5,537 sf 100.00% Impervious Runoff Depth>2.87" Tc=6.0 min CN=98 Runoff=0.40 cfs 0.030 af
Pond 1:	Peak Elev=112.71' Inflow=1.12 cfs 0.082 af 15.0" Round Culvert n=0.013 L=19.0' S=0.0053 '/' Outflow=1.12 cfs 0.082 af
Pond 2:	Peak Elev=112.76' Inflow=0.92 cfs 0.067 af 15.0" Round Culvert n=0.013 L=23.0' S=0.0052 '/' Outflow=0.92 cfs 0.067 af
Pond 11:	Peak Elev=112.61' Inflow=0.06 cfs 0.005 af 15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.06 cfs 0.005 af
Pond 12:	Peak Elev=112.33' Inflow=0.12 cfs 0.009 af 15.0" Round Culvert n=0.013 L=16.0' S=0.0100 '/' Outflow=0.12 cfs 0.009 af
Pond A1:	Peak Elev=114.94' Inflow=1.89 cfs 0.142 af 15.0" Round Culvert n=0.013 L=26.0' S=0.0050 '/' Outflow=1.89 cfs 0.142 af
Pond A10:	Peak Elev=113.11' Inflow=0.20 cfs 0.015 af 15.0" Round Culvert n=0.013 L=16.0' S=0.0100 '/' Outflow=0.20 cfs 0.015 af
Pond A2:	Peak Elev=114.69' Inflow=0.21 cfs 0.016 af 15.0" Round Culvert n=0.013 L=62.0' S=0.0050 '/' Outflow=0.21 cfs 0.016 af
Pond A3:	Peak Elev=115.78' Inflow=1.50 cfs 0.113 af 15.0" Round Culvert n=0.013 L=41.0' S=0.0100 '/' Outflow=1.50 cfs 0.113 af
Pond A4:	Peak Elev=116.49' Inflow=0.15 cfs 0.011 af 15.0" Round Culvert n=0.013 L=49.0' S=0.0051 '/' Outflow=0.15 cfs 0.011 af
Pond A5:	Peak Elev=116.54' Inflow=1.13 cfs 0.084 af 15.0" Round Culvert n=0.013 L=77.0' S=0.0100 '/' Outflow=1.13 cfs 0.084 af
Pond A6:	Peak Elev=116.77' Inflow=0.48 cfs 0.036 af 15.0" Round Culvert n=0.013 L=52.0' S=0.0050 '/' Outflow=0.48 cfs 0.036 af
Pond A7:	Peak Elev=115.40' Inflow=0.51 cfs 0.038 af 15.0" Round Culvert n=0.013 L=52.0' S=0.0050 '/' Outflow=0.51 cfs 0.038 af

Post-Development-AP-2 & 3

Type III 24-hr 2-YR Rainfall=3.30"

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Pond A8: Peak Elev=115.67' Inflow=0.45 cfs 0.034 af
15.0" Round Culvert n=0.013 L=59.0' S=0.0051 '/' Outflow=0.45 cfs 0.034 af

Pond A9: Peak Elev=113.02' Inflow=0.66 cfs 0.047 af
15.0" Round Culvert n=0.013 L=41.0' S=0.0100 '/' Outflow=0.66 cfs 0.047 af

Pond C1: Peak Elev=116.25' Inflow=0.88 cfs 0.075 af
15.0" Round Culvert n=0.013 L=81.0' S=0.0463 '/' Outflow=0.88 cfs 0.075 af

Pond SF1: SOIL FILTER 1 Peak Elev=114.05' Storage=6,608 cf Inflow=2.72 cfs 0.201 af
Primary=0.09 cfs 0.054 af Secondary=0.00 cfs 0.000 af Outflow=0.09 cfs 0.054 af

Pond SF2: SOIL FILTER 2 Peak Elev=111.64' Storage=3,193 cf Inflow=2.08 cfs 0.177 af
Primary=1.33 cfs 0.110 af Secondary=0.00 cfs 0.000 af Outflow=1.33 cfs 0.110 af

Link AP-2: Inflow=5.65 cfs 0.657 af
Primary=5.65 cfs 0.657 af

Link AP-3: Inflow=0.61 cfs 0.059 af
Primary=0.61 cfs 0.059 af

Total Runoff Area = 7.701 ac Runoff Volume = 0.931 af Average Runoff Depth = 1.45"
82.71% Pervious = 6.370 ac 17.29% Impervious = 1.331 ac

Post-Development-AP-2 & 3

Type III 24-hr 10-YR Rainfall=4.90"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SA-2:	Runoff Area=209,759 sf 4.77% Impervious Runoff Depth>2.43" Flow Length=660' Tc=26.9 min CN=78 Runoff=8.78 cfs 0.975 af
Subcatchment SA-2A:	Runoff Area=2,804 sf 100.00% Impervious Runoff Depth>4.33" Flow Length=190' Tc=6.0 min CN=98 Runoff=0.30 cfs 0.023 af
Subcatchment SA-2B:	Runoff Area=3,586 sf 100.00% Impervious Runoff Depth>4.33" Flow Length=190' Tc=6.0 min CN=98 Runoff=0.39 cfs 0.030 af
Subcatchment SA-2C:	Runoff Area=3,954 sf 0.00% Impervious Runoff Depth>2.62" Flow Length=40' Slope=0.1750 '/' Tc=6.0 min CN=80 Runoff=0.29 cfs 0.020 af
Subcatchment SA-2D:	Runoff Area=23,916 sf 20.91% Impervious Runoff Depth>2.98" Flow Length=223' Tc=13.7 min CN=84 Runoff=1.58 cfs 0.136 af
Subcatchment SA-2E:	Runoff Area=888 sf 100.00% Impervious Runoff Depth>4.33" Tc=6.0 min CN=98 Runoff=0.10 cfs 0.007 af
Subcatchment SA-2F:	Runoff Area=782 sf 100.00% Impervious Runoff Depth>4.33" Tc=6.0 min CN=98 Runoff=0.08 cfs 0.006 af
Subcatchment SA-3:	Runoff Area=32,582 sf 0.00% Impervious Runoff Depth>2.03" Flow Length=108' Slope=0.0370 '/' Tc=17.6 min CN=73 Runoff=1.35 cfs 0.126 af
Subcatchment SA-3A:	Runoff Area=7,214 sf 90.84% Impervious Runoff Depth>4.16" Flow Length=102' Slope=0.0069 '/' Tc=6.0 min CN=96 Runoff=0.76 cfs 0.057 af
Subcatchment SA-3B:	Runoff Area=2,033 sf 100.00% Impervious Runoff Depth>4.33" Flow Length=82' Slope=0.0201 '/' Tc=6.0 min CN=98 Runoff=0.22 cfs 0.017 af
Subcatchment SA-3C:	Runoff Area=1,985 sf 4.33% Impervious Runoff Depth>2.71" Flow Length=40' Slope=0.0150 '/' Tc=6.0 min CN=81 Runoff=0.15 cfs 0.010 af
Subcatchment SA-3D:	Runoff Area=5,267 sf 100.00% Impervious Runoff Depth>4.33" Flow Length=81' Slope=0.0172 '/' Tc=6.0 min CN=98 Runoff=0.57 cfs 0.044 af
Subcatchment SA-3E:	Runoff Area=2,898 sf 100.00% Impervious Runoff Depth>4.33" Flow Length=80' Slope=0.0225 '/' Tc=6.0 min CN=98 Runoff=0.31 cfs 0.024 af
Subcatchment SA-3F:	Runoff Area=2,559 sf 93.86% Impervious Runoff Depth>4.25" Flow Length=60' Slope=0.0200 '/' Tc=6.0 min CN=97 Runoff=0.27 cfs 0.021 af
Subcatchment SA-3G:	Runoff Area=9,411 sf 0.00% Impervious Runoff Depth>2.36" Flow Length=60' Slope=0.0875 '/' Tc=6.0 min CN=77 Runoff=0.63 cfs 0.043 af
Subcatchment SA-3H:	Runoff Area=2,721 sf 100.00% Impervious Runoff Depth>4.33" Flow Length=211' Tc=6.0 min CN=98 Runoff=0.29 cfs 0.023 af

Post-Development-AP-2 & 3

Type III 24-hr 10-YR Rainfall=4.90"

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Subcatchment SA-3I:	Runoff Area=8,561 sf 30.28% Impervious Runoff Depth>3.37" Flow Length=150' Slope=0.0140 '/' Tc=6.0 min CN=88 Runoff=0.79 cfs 0.055 af
Subcatchment SA-3J:	Runoff Area=2,569 sf 0.00% Impervious Runoff Depth>2.71" Flow Length=48' Slope=0.0625 '/' Tc=6.0 min CN=81 Runoff=0.20 cfs 0.013 af
Subcatchment SA-3K:	Runoff Area=1,602 sf 0.00% Impervious Runoff Depth>2.62" Flow Length=33' Slope=0.0758 '/' Tc=6.0 min CN=80 Runoff=0.12 cfs 0.008 af
Subcatchment SA-3L:	Runoff Area=4,848 sf 100.00% Impervious Runoff Depth>4.33" Tc=6.0 min CN=98 Runoff=0.52 cfs 0.040 af
Subcatchment SA-3M:	Runoff Area=5,537 sf 100.00% Impervious Runoff Depth>4.33" Tc=6.0 min CN=98 Runoff=0.59 cfs 0.046 af
Pond 1:	Peak Elev=112.88' Inflow=1.77 cfs 0.131 af 15.0" Round Culvert n=0.013 L=19.0' S=0.0053 '/' Outflow=1.77 cfs 0.131 af
Pond 2:	Peak Elev=112.92' Inflow=1.47 cfs 0.107 af 15.0" Round Culvert n=0.013 L=23.0' S=0.0052 '/' Outflow=1.47 cfs 0.107 af
Pond 11:	Peak Elev=112.64' Inflow=0.10 cfs 0.007 af 15.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.10 cfs 0.007 af
Pond 12:	Peak Elev=112.37' Inflow=0.18 cfs 0.014 af 15.0" Round Culvert n=0.013 L=16.0' S=0.0100 '/' Outflow=0.18 cfs 0.014 af
Pond A1:	Peak Elev=115.18' Inflow=2.88 cfs 0.219 af 15.0" Round Culvert n=0.013 L=26.0' S=0.0050 '/' Outflow=2.88 cfs 0.219 af
Pond A10:	Peak Elev=113.16' Inflow=0.29 cfs 0.023 af 15.0" Round Culvert n=0.013 L=16.0' S=0.0100 '/' Outflow=0.29 cfs 0.023 af
Pond A2:	Peak Elev=114.74' Inflow=0.31 cfs 0.024 af 15.0" Round Culvert n=0.013 L=62.0' S=0.0050 '/' Outflow=0.31 cfs 0.024 af
Pond A3:	Peak Elev=115.96' Inflow=2.29 cfs 0.174 af 15.0" Round Culvert n=0.013 L=41.0' S=0.0100 '/' Outflow=2.29 cfs 0.174 af
Pond A4:	Peak Elev=116.53' Inflow=0.22 cfs 0.017 af 15.0" Round Culvert n=0.013 L=49.0' S=0.0051 '/' Outflow=0.22 cfs 0.017 af
Pond A5:	Peak Elev=116.67' Inflow=1.73 cfs 0.130 af 15.0" Round Culvert n=0.013 L=77.0' S=0.0100 '/' Outflow=1.73 cfs 0.130 af
Pond A6:	Peak Elev=116.86' Inflow=0.75 cfs 0.056 af 15.0" Round Culvert n=0.013 L=52.0' S=0.0050 '/' Outflow=0.75 cfs 0.056 af
Pond A7:	Peak Elev=115.51' Inflow=0.84 cfs 0.061 af 15.0" Round Culvert n=0.013 L=52.0' S=0.0050 '/' Outflow=0.84 cfs 0.061 af

Post-Development-AP-2 & 3

Type III 24-hr 10-YR Rainfall=4.90"

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Pond A8: Peak Elev=115.77' Inflow=0.72 cfs 0.053 af
15.0" Round Culvert n=0.013 L=59.0' S=0.0051 '/' Outflow=0.72 cfs 0.053 af

Pond A9: Peak Elev=113.14' Inflow=1.08 cfs 0.078 af
15.0" Round Culvert n=0.013 L=41.0' S=0.0100 '/' Outflow=1.08 cfs 0.078 af

Pond C1: Peak Elev=116.45' Inflow=1.58 cfs 0.136 af
15.0" Round Culvert n=0.013 L=81.0' S=0.0463 '/' Outflow=1.58 cfs 0.136 af

Pond SF1: SOIL FILTER 1 Peak Elev=114.39' Storage=8,049 cf Inflow=4.34 cfs 0.323 af
Primary=0.78 cfs 0.172 af Secondary=0.00 cfs 0.000 af Outflow=0.78 cfs 0.172 af

Pond SF2: SOIL FILTER 2 Peak Elev=111.75' Storage=3,443 cf Inflow=3.50 cfs 0.300 af
Primary=3.36 cfs 0.233 af Secondary=0.00 cfs 0.000 af Outflow=3.36 cfs 0.233 af

Link AP-2: Inflow=11.45 cfs 1.380 af
Primary=11.45 cfs 1.380 af

Link AP-3: Inflow=1.35 cfs 0.126 af
Primary=1.35 cfs 0.126 af

Total Runoff Area = 7.701 ac Runoff Volume = 1.724 af Average Runoff Depth = 2.69"
82.71% Pervious = 6.370 ac 17.29% Impervious = 1.331 ac

Appendix D
Water Quality Calculations and BMP Sizing

WATER QUALITY CALCULATIONS
Barra Road Subdivision
Biddeford

Subcatchment ID	Proposed Impervious Area (sq. ft.)	Proposed Lawn Area (sq. ft.)	Proposed Developed Area (sq. ft.)	Treated Impervious Area (sq. ft.)	Treated Developed Area (sq. ft.)	BMP ID
1	1,477	7,562	9,039	0	0	Untreated
1A	816		816	816	816	Soil Filter 3
1B	1,149		1,149	1,149	1,149	Soil Filter 3
1C	3,309		3,309	3,309	3,309	Soil Filter 3
1D	4,592		4,592	4,592	4,592	Soil Filter 3
1E	1,448	182	1,630	1,448	1,630	Soil Filter 3
1F	2,737	241	2,978	2,737	2,978	Soil Filter 3
1G	2,298		2,298	2,298	2,298	Soil Filter 3
1H	2,916		2,916	2,916	2,916	Soil Filter 3
1I		9,814	9,814	0	0	Untreated
1J		6,754	6,754	0	6,754	Soil Filter 3
1K		1,632	1,632	0	0	Untreated
2		9,916	9,916	0	0	Untreated
2A	2,804		2,804	2,804	2,804	Soil Filter 2
2B	3,586		3,586	3,586	3,586	Soil Filter 2
2C		3,954	3,954	0	3,954	Soil Filter 2
2D*	0	1,919	1,919	0	1,919	Soil Filter 2
2E	888		888	888	888	Soil Filter 2
2F	782		782	782	782	Soil Filter 2
Total	28,802	41,974	70,776	27,325	40,375	

* Portion of Subcatchment 2D associated with development of Subdivision

Subdivision Linear Treatment Summary	
Total Proposed Impervious Area (sq. ft.)=	28,802
Total Proposed Developed Area (sq. ft.)=	70,776
Total Treated Impervious Area (sq. ft.)=	27,325
Total Treated Developed Area (sq. ft.)=	40,375
Impervious Area Treatment % =	94.9%
Developed Area Treatment % =	57.0%

Barra Road Subdivision Biddeford - SF2 - Trailside Way Grassed Underdrain Soil Filter Calculations

Subcatchment ID	Proposed Impervious Area (ft ²)	WQ Impervious Area Runoff Depth (inches)	WQ Impervious Volume Required (ft ³)	Proposed Landscaped Area (ft ²)	Undeveloped Area (ft ²)	Undeveloped Area 50% Reduction*** (ft ²)	WQ Landscape Area Runoff Depth (inches)	WQ Landscape Volume Required (ft ³)	Total WQ Volume Required (ft ³)
2A	2,804	1.00	234	0	0	0	0.40	0	234
2B	3,586	1.00	299	0	0	0	0.40	0	299
2C	0	1.00	0	3,954	0	0	0.40	132	132
2D*	0	1.00	0	1,919	9,951	4,976	0.40	230	230
2D**	0	1.00	0	6,947	5,099	2,550	0.40	317	317
2E	888	1.00	74	0	0	0	0.40	0	74
2F	782	1.00	65	0	0	0	0.40	0	65
3H	2,721	1.00	227	0	0	0	0.40	0	227
3I	4,612	1.00	384	3,949	0	0	0.40	132	516
Total	15,393		1,283	16,769	15,050	7,525		810	2,093

* Portion of Subcatchment 2D associated with development of Subdivision

** Portion of Subcatchment 2D associated with just development of Avesta property

***Undeveloped areas routed to soil filter considered at 50% of sizing requirements based on Maine DEP Chapter 500 Section 4-C-(2)-(b)

Summary of Underdrain Filter Sizing	
Total WQ Volume Required (ft ³)	2,093
WQ Volume Provided (ft ³)	2,406
Filter Surface Elevation	110.00
WQ Surface Elevation	111.50
Invert of Underdrain	107.67
5% of Tributary Impervious Area (ft ²)	770
2% of Tributary Landscaped (ft ²)	335
Filter Surface Area Required (ft ²)	1,105
Filter Surface Area Provided (ft ²)	1,117

OK

OK

Orifice Sizing	
Discharge Coefficient	0.62
Orifice Size (inches)	0.75
Orifice Size (feet)	0.06
Orifice Area (ft ²)	0.003
Orifice Centerline Elevation	107.70

(3/4")

Orifice Eqn: $C \cdot A \cdot (2gH)^{1/2}$

Underdrain Filter Volume				
Elevation	Surface Area (ft ²)	Average Stage Area (ft ²)	Stage Volume (ft ³)	Cumulative Volume (ft ³)
110	1,117			0
111	1,784	1,451	1,451	1,451
111.5	2,036	1,910	955	2,406
112	2,303	2,170	1,085	3,490
112.5	2,583	2,443	1,222	4,712
Water Quality Volume Provided (at Elevation 111.5) =				2,406

Q (cfs)	Stage Elevation	Total Drawdown at Stage	Pond Area	Drawdown Time (hrs)
0.0231	110	0.00	1,117	0.00
0.0277	111	1.00	1,784	17.89
0.0297	111.5	0.50	2,036	9.51
Total Drawdown Time =				27.40

Required Sediment Storage			Provided Storage Volume		
Area to be Sanded	0.4	acres	Total # of CB's	6	
Sand Used per Storm	500	lbs/acre-storm	Sump Depth	2	ft
Weight of Sand	90	lbs/cf	CB Diameter	4	ft
# of Storms per Year	10	storms/year	CB Sediment Storage Volume	150.72	cf
Sediment Storage Required	19.63	cf/year	Forebay Volume	100	cf
			Total Volume	250.72	cf

Barra Road Subdivision Biddeford - SF 3 - Barra Road Grassed Underdrain Soil Filter Calculations

Subcatchment ID	Proposed Impervious Area (ft ²)	WQ Impervious Area Runoff Depth (inches)	WQ Impervious Volume Required (ft ³)	Proposed Landscaped Area (ft ²)	Undeveloped Area (ft ²)	Undeveloped Area 50% Reduction* (ft ²)	WQ Landscape Area Runoff Depth (inches)	WQ Landscape Volume Required (ft ³)	Total WQ Volume Required (ft ³)
1A	816	1.00	68	0	0	0	0.40	0	68
1B	1,149	1.00	96	0	0	0	0.40	0	96
1C	3,309	1.00	276	0	0	0	0.40	0	276
1D	4,592	1.00	383	0	0	0	0.40	0	383
1E	1,448	1.00	121	182	0	0	0.40	6	127
1F	2,737	1.00	228	241	0	0	0.40	8	236
1G	2,298	1.00	192	0	0	0	0.40	0	192
1H	2,916	1.00	243	0	0	0	0.40	0	243
1J	0	1.00	0	6,754	9,136	4,568	0.40	377	377
Total	19,265		1,605	7,177	9,136	4,568		392	1,997

*Undeveloped areas routed to soil filter considered at 50% of sizing requirements based on Maine DEP Chapter 500 Section 4-C-(2)-(b)

Summary of Underdrain Filter Sizing	
Total WQ Volume Required (ft ³)	1,997
WQ Volume Provided (ft ³)	2,725
Filter Surface Elevation	102.50
WQ Surface Elevation	104.00
Invert of Underdrain	100.17
5% of Tributary Impervious Area (ft ²)	963
2% of Tributary Landscaped (ft ²)	235
Filter Surface Area Required (ft ²)	1,198
Filter Surface Area Provided (ft ²)	1,347

OK

OK

Orifice Sizing	
Discharge Coefficient	0.62
Orifice Size (inches)	0.75
Orifice Size (feet)	0.06
Orifice Area (ft ²)	0.003
Orifice Centerline Elevation	100.20

(3/4")

Orifice Eqn: $C \cdot A \cdot (2gH)^{1/2}$

Underdrain Filter Volume				
Elevation	Surface Area (ft ²)	Average Stage Area (ft ²)	Stage Volume (ft ³)	Cumulative Volume (ft ³)
102.5	1,347			0
		1,516	758	
103	1,685			758
		1,967	1,967	
104	2,248			2,725
		2,558	2,558	
105	2,867			5,282
		3,205	3,205	
106	3,542			8,487
Water Quality Volume Provided (at Elevation 104) =				2,725

Q (cfs)	Stage Elevation	Total Drawdown at Stage	Pond Area	Drawdown Time (hrs)
0.0231	102.5	0.00	1,347	0.00
0.0255	103	0.50	1,685	9.17
0.0297	104	1.00	2,248	21.00
Total Drawdown Time =				30.18

Required Sediment Storage			Provided Storage Volume		
Area to be Sanded	0.4	acres	Total # of CB's	8	
Sand Used per Storm	500	lbs/acre-storm	Sump Depth	2	ft
Weight of Sand	90	lbs/cf	CB Diameter	4	ft
# of Storms per Year	10	storms/year	CB Sediment Storage Volume	200.96	cf
Sediment Storage Required	24.57	cf/year	Forebay Volume	53	cf
			Total Volume	253.96	cf

WATER QUALITY CALCULATIONS
Avesta Barra Road 46-Unit
Biddeford

Subcatchment ID	Proposed Impervious Area (sq. ft.)	Proposed Lawn Area (sq. ft.)	Proposed Developed Area (sq. ft.)	Treated Impervious Area (sq. ft.)	Treated Developed Area (sq. ft.)	BMP ID
2		6,458	6,458	0	0	Untreated
3		7,421	7,421	0	0	Untreated
3A	6,553	661	7,214	6,553	7,214	Soil Filter 1
3B	2,033		2,033	2,033	2,033	Soil Filter 1
3C	86	1,899	1,985	86	1,985	Soil Filter 1
3D	5,267		5,267	5,267	5,267	Soil Filter 1
3E	2,898		2,898	2,898	2,898	Soil Filter 1
3F	2,402	157	2,559	2,402	2,559	Soil Filter 1
3G		9,411	9,411	0	9,411	Soil Filter 1
3H	2,721		2,721	2,721	2,721	Soil Filter 2
3I	4,612	3,949	8,561	4,612	8,561	Soil Filter 2
3J	235	2,334	2,569	235	2,569	Soil Filter 1
3K		1,602	1,602	0	1,602	Soil Filter 1
3L	4,848		4,848	4,848	4,848	Soil Filter 1
3M	5,537		5,537	5,537	5,537	Soil Filter 1
2D*		6,947	6,947	0	6,947	Soil Filter 2
Total	37,192	40,839	78,031	37,192	64,152	

* Portion of Subcatchment 2D associated with development of Avesta property

Avesta Site Treatment Summary	
Total Proposed Impervious Area (sq. ft.)=	37,192
Total Proposed Developed Area (sq. ft.)=	78,031
Total Treated Impervious Area (sq. ft.)=	37,192
Total Treated Developed Area (sq. ft.)=	64,152
Impervious Area Treatment %* =	100.0%
Developed Area Treatment % =	82.2%

Avesta Barra Road Biddeford - SF1 - Grassed Underdrain Soil Filter Calculations

Subcatchment ID	Proposed Impervious Area (ft ²)	WQ Impervious Area Runoff Depth (inches)	WQ Impervious Volume Required (ft ³)	Proposed Landscaped Area (ft ²)	WQ Landscape Area Runoff Depth (inches)	WQ Landscape Volume Required (ft ³)	Total WQ Volume Required (ft ³)
3A	6,553	1.00	546	661	0.40	22	568
3B	2,033	1.00	169	0	0.40	0	169
3C	86	1.00	7	1,899	0.40	63	70
3D	5,267	1.00	439	0	0.40	0	439
3E	2,898	1.00	242	0	0.40	0	242
3F	2,402	1.00	200	157	0.40	5	205
3G	0	1.00	0	9,411	0.40	314	314
3J	235	1.00	20	2,334	0.40	78	97
3K	0	1.00	0	1,602	0.40	53	53
3L	4,848	1.00	404	0	0.40	0	404
3M	5,537	1.00	461	0	0.40	0	461
Total	29,859		2,488	16,064		535	3,024

Summary of Underdrain Filter Sizing	
Total WQ Volume Required (ft ³)	3,024
WQ Volume Provided (ft ³)	5,159
Filter Surface Elevation	112.50
WQ Surface Elevation	114.00
Invert of Underdrain	110.17
5% of Tributary Impervious Area (ft ²)	1,493
2% of Tributary Landscaped (ft ²)	321
Filter Surface Area Required (ft ²)	1,814
Filter Surface Area Provided (ft ²)	2,725

OK

OK

Orifice Sizing	
Discharge Coefficient	0.62
Orifice Size (inches)	1
Orifice Size (feet)	0.08
Orifice Area (ft ²)	0.005
Orifice Centerline Elevation	110.21

Orifice Eqn: $C \cdot A \cdot (2gH)^{1/2}$

Underdrain Filter Volume				
Elevation	Surface Area (ft ²)	Average Stage Area (ft ²)	Stage Volume (ft ³)	Cumulative Volume (ft ³)
112.5	2,725			0
		2,993	1,496	
113	3,260			1,496
		3,663	3,663	
114	4,065			5,159
		4,385	3,289	
114.75	4,705			8,448
		4,816	1,204	
115	4,926			9,651
Water Quality Volume Provided (at Elevation 144.5) =				5,159

Q (cfs)	Stage Elevation	Total Drawdown at Stage	Pond Area	Drawdown Time (hrs)
0.0410	112.5	0.00	2,725	0.00
0.0453	113	0.50	3,260	10.00
0.0528	114	1.00	4,065	21.39
Total Drawdown Time =				31.39

Required Sediment Storage			Provided Storage Volume		
Area to be Sanded	0.7	acres	Total # of CB's	12	
Sand Used per Storm	500	lbs/acre-storm	Sump Depth	2	ft
Weight of Sand	90	lbs/cf	CB Diameter	4	ft
# of Storms per Year	10	storms/year	CB Sediment Storage Volume	301.44	cf
Sediment Storage Required	38.08	cf/year	Forebay Volume	106	cf
			Total Volume	407.44	cf

**EROSION AND SEDIMENTATION CONTROL
INSPECTION AND MAINTENANCE PLAN**

**Barra Road Subdivision
Barra Road
Biddeford, Maine**

Submitted by:

**Indian Cliff Development Corp.
260 Main Street
P.O. Box 444
Biddeford, ME**

Prepared by:



Date:
July 2024

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1.0 INTRODUCTION

The intent of this plan is to establish inspection and maintenance procedures to be implemented for erosion and sediment control best management practices (BMP's) during construction, as well as for post-construction stormwater BMP's, for a 9 lot Subdivision. This plan has been prepared in conformance with the requirements set forth in 06-096 Chapter 500 – Stormwater Management, and the City of Biddeford Post-Construction Stormwater Management requirements.

1.1 PROJECT DESCRIPTION

The applicant, Indian Cliff Development Corp., is proposing a 9 lot Subdivision off the end of Barra Road in Biddeford, Maine. The project seeks to permit 7 new residential lots meeting bulk and space requirements for duplex housing to be developed by others, 1 new lot proposed to be developed by Avesta Housing, 1 new non-buildable lot supporting stormwater and access, and 2 roads meeting City requirements, to be offered to the City for acceptance. The project is required to obtain a Stormwater Law Permit from the Maine DEP and a Subdivision Permit from the City of Biddeford. The Avesta Housing property will be permitted independent of this Plan.

The scope of work includes but is not limited to:

- Tree clearing
- Stumping, grubbing and subgrade preparation.
- Construction of 2 new City Streets
- Construction of public utilities
- Construction of stormwater BMP's

The proposed development will create approximately 0.65 acres of new impervious area.

1.2 REQUIRED PERMITS

The following is a list of Municipal, State, and Federal permits that are required for the Project:

Municipal

City of Biddeford Subdivision Permit

State of Maine

Maine DEP Stormwater Law Permit

1.3 **REFERENCES**

This plan has been developed in accordance with the following:

- Stormwater Management Law 38 M.R.S. §420-C and §420-D
<http://legislature.maine.gov/statutes/38/title38sec420-C.html>
<http://legislature.maine.gov/statutes/38/title38sec420-D.html>
- 06-096 Chapter 500 – Stormwater Management
<http://www.maine.gov/sos/cec/rules/06/096/096c500.docx>
- General Permit – Construction Activity
Maine Pollutant Discharge Elimination System (MPDES)
<https://www.maine.gov/dep/land/stormwater/construction.html>
- Maine Erosion and Sediment Control Best Management Practices (BMPs)
Manual for Designers and Engineers
https://www.maine.gov/dep/land/erosion/escbmps/esc_bmp_engineers.pdf
- Maine Erosion and Sediment Control Practices Field Guide for Contractors
https://www.maine.gov/dep/land/erosion/escbmps/esc_bmp_field.pdf
- MaineDOT Best Management Practices for Erosion and Sedimentation Control
<https://www.maine.gov/mdot/env/documents/bmp/BMP2008full.pdf>
- City of Biddeford Maine Ordinances
<https://ecode360.com/BI3074>

1.4 **RESPONSIBLE PARTIES**

Preparer/Design Engineer: Christopher MacDonald, PE
BH2M
380B Main Street
Gorham, ME 04038
(207) 839-2771

Developer/Applicant: Indian Cliff Development Corp.
260 Main Street
P.O. Box 444
Biddeford, Maine

Site Contractor: TBD

Owner: Indian Cliff Development Corp.
260 Main Street
P.O. Box 444
Biddeford, Maine

Post Construction Stormwater Inspector: Barra Road Homeowners Association

Stormwater Maintenance Barra Road Homeowners Association

During Construction: Indian Cliff Development Corp.

Post Construction: Barra Road Homeowners Association

During construction, the Developer/Applicant or their representatives will be responsible for implementing the erosion and sediment control BMP's as well routine inspections and maintenance of the BMP's.

Post-construction stormwater BMP inspection, maintenance, reporting, and required recertifications will be the responsibility of the property owner.

1.5 INSPECTION AND MAINTENANCE – DURING CONSTRUCTION

Anyone who conducts or directs an activity that involves exposing, filling or displacing soil or other earthen materials should take appropriate measures to prevent erosion and the loss of sediment beyond the project site or into a sensitive resource. Erosion and sediment control measures should be in place before the activity begins and should remain functional until the site is permanently stabilized. All measures should remain effective until all areas are permanently stabilized. Any disturbed area should be regularly inspected until the site is fully stabilized with either 90% grass cover or a permanent impervious surface such as pavement. A person who has the knowledge of erosion and sediment control measures and of stormwater management practices should inspect the site at a minimum once a week, and before and after a storm event. Any failing measure should be repaired or modified to adequately stabilize the site prior to the next storm event or no later than 7 calendar days. The inspection frequency table found in Appendix D shall be used as a guide for inspecting each specific BMP. The inspection form found in Appendix B shall be used to record the inspection, its outcome, and the required maintenance.

Refer to the Plans found in Appendix A for additional erosion and sediment control details and narratives.

General Inspection, Maintenance, and Documentation Requirements

1. Inspection and corrective action: Inspect disturbed and impervious areas, erosion control measures, and material storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. Inspect these areas at least once a week as well as before and within 24 hours after a storm event, and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections.
2. Maintenance: If BMP's need to be repaired, the repair work should be initiated upon discovery of the problem but no later than the end of the next workday. If additional BMPs or significant repair of BMPs are necessary, implementation must be completed within 7 calendar days and prior to any storm event. All measures must be maintained in effective operating condition until areas are permanently stabilized.
3. Documentation: Maintain a binder with construction inspection forms summarizing the inspections and any corrective action taken. The forms must include the name and qualifications of the person making the inspections, the date of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicle access points to the parcel. Refer to Appendix B for the construction inspection form. Major observations must include BMP's that need maintenance, BMP's that failed to

operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the inspection form what corrective action taken and when it was taken. The Owner shall retain a copy of the inspection forms for a period of at least five years from the completion of permanent stabilization.

Site-Specific BMP's

Refer to Appendix D for inspection and maintenance requirements and frequencies of site-specific BMP's. Refer to the Plans found in Appendix A for narratives and details of the site-specific BMP's. The following is a list of the site-specific BMP's that will require routine inspection and maintenance:

- Sedimentation Barriers (Silt Fence or Erosions Control Mix Berm)
- Stabilized Construction Entrance
- Construction Limit Barrier Fence
- Stone Check Dam
- Temporary Sediment Trap
- Temporary Grass/Stone Lined Swale
- Roadways
- Snow Storage Areas
- Sediment Forebays
- Pipe Outlets
- Grassed Underdrained Soil Filter

Winter Construction

Winter construction is construction activity performed during the period from November 1 through April 15. If disturbed areas are not stabilized with permanent measures by November 1 or new soil disturbance occurs after November 1, but before April 15, then these areas must be protected and runoff from them must be controlled by additional measures and restrictions.

1. Site Stabilization: For winter stabilization, hay mulch is applied at twice the standard temporary stabilization rate. At the end of each construction day, areas that have been brought to final grade must be stabilized. Mulch may not be spread on top of snow.
2. Sediment Barriers: All areas within 75 feet of a protected natural resource must be protected with a double row of sediment barriers.
3. Ditches: All vegetated ditch lines that have not been stabilized by November 1, or will be worked during the winter construction period, must be stabilized with an appropriate stone lining backed by an appropriate gravel bed or geotextile unless specifically released from this standard by Maine DEP.

-
4. Slopes: Mulch netting must be used to anchor mulch on all slopes greater than 8% unless erosion control blankets or erosion control mix is being used on these slopes.

Refer to the Plans contained in Appendix A for additional winter construction erosion and sediment control requirements.

1.6 INSPECTION AND MAINTENANCE – POST-CONSTRUCTION

The long-term operation and maintenance of a stormwater management system is as critical to its performance as its design and construction. Proper operation and maintenance practices ensure that stormwater BMP's continue to improve water quality by removing pollutants effectively over the long-term and decreasing the risk of re-suspending sediment. Without proper maintenance, BMPs are likely to fail and will no longer provide treatment of stormwater. The following includes a summary of the inspection, maintenance, and documentation requirements for post-construction stormwater BMP's.

Refer to the Plans contained in Appendix A for details and locations of site-specific post-construction BMP's and Appendix F for Annual Stormwater Management Facilities Certification form for the City of Biddeford. See section 5. below for addition information on City requirements.

General Inspection, Maintenance, and Documentation Requirements

1. Inspection and maintenance: All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections. The following areas, facilities, and measures must be inspected and identified deficiencies must be corrected. Areas, facilities, and measures other than those listed below may also require inspection on a specific site.
 - a) Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after significant rainfall events (1 inch in 24-hour period) to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.
 - b) Inspect ditches, swales and other open stormwater channels in the spring, in late fall, and after significant rainfall events (1 inch in 24-hour period) to remove any obstructions to flow, remove accumulated sediments and debris, to control vegetated growth that could obstruct flow, and to repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If

the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or side slopes.

- c) Inspect culverts in the spring, in late fall, and after heavy rains to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.
- d) Inspect at least once per year, each underdrained soil filter, including the filter embankments, vegetation, underdrain piping, and overflow spillway. Remove and dispose of accumulated sediments in the filter. If needed, rehabilitate any clogged surface linings, and flush underdrain piping.

2. Regular maintenance

- 1. Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader. Grading of gravel roads, or grading of the gravel shoulders of gravel or paved roads, must be routinely performed to ensure that stormwater drains immediately off the road surface to adjacent buffer areas or stable ditches, and is not impeded by accumulations of graded material on the road shoulder or by excavation of false ditches in the shoulder. If water bars or open-top culverts are used to divert runoff from road surfaces, clean-out any sediments within or at the outlet of these structures to restore their function.
- 3. Documentation: Maintain a binder of inspection forms summarizing inspection, maintenance, and any corrective actions taken. The inspection forms must include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. Refer to Appendix C for inspection forms. If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed of after removal. The log must be made accessible to Department staff and a copy provided to the Department upon request. The Owner shall retain a copy of the logs for a period of at least five years from the completion of permanent stabilization.
- 4. The site-specific post-construction BMP's for the project include the following:
 - Vegetated swales
 - Roadways and shoulders

-
- Storm Drain System
 - Snow storage areas
 - Rip rap inlet and outlet aprons
 - Sediment forebay
 - Pipe outlets
 - Grassed Underdrained Soil Filter
5. The City of Biddeford requires that annual inspections of the stormwater facilities be made on a yearly basis by a Qualified Post-Construction Stormwater Inspector, with annual inspections being reported to the City Engineer by March 1st of each year, per Chapter 34 Article VI “Post-Construction Stormwater Discharge” of the City’s code of Ordinances. See Attachment F for the current copy the Annual Stormwater Management Facilities Certification form for use in reporting these inspections to the City.

1.7 **HOUSEKEEPING**

The following performance standards shall apply:

1. Spill prevention: Controls must be used to prevent pollutants from construction and waste materials stored on site to enter stormwater, which includes storage practices to minimize exposure of the materials to stormwater. The site contractor or operator must develop and implement as necessary appropriate spill prevention, containment, and response planning measures.

NOTE: Any spill or release of toxic or hazardous substances must be reported to the Department. For oil spills, call 1-800-482-0777 which is available 24 hours a day. For

spills of toxic or hazardous material, call 1-800-452-4664 which is available 24 hours a day. For more information, visit the Department’s website at :

<http://www.maine.gov/dep/spills/emergspillresp/>

2. Groundwater protection: During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials. Any project proposing infiltration of stormwater must provide adequate pre-treatment of stormwater prior to discharge of stormwater to the infiltration area, or provide for treatment within the infiltration area in order to prevent the accumulation of fines, reduction in infiltration rate, and consequent flooding and destabilization.

See 06-096 Chapter 500 - Appendix D for license by rule standards for infiltration of stormwater.

NOTE: Lack of appropriate pollutant removal best management practices (BMPs) may result in violations of the groundwater quality standard established by 38 M.R.S.A. §465-C(1).

3. Fugitive sediment and dust: Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control, but other water additives may be considered as needed. A stabilized construction entrance (SCE) should be included to minimize tracking of mud and sediment. If off-site tracking occurs, public roads should be swept immediately, no less than once a week, and prior to significant storm events. Operations during dry months that experience fugitive dust problems, should wet down unpaved access roads once a week or more frequently as needed with a water additive to suppress fugitive sediment and dust.

NOTE: Take care in sourcing water. Dewatering a stream without a permit from the Department may violate state water quality standards and the *Natural Resources Protection Act*.

4. Debris and other materials: Minimize the exposure of construction debris, building and landscaping materials, trash, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials to precipitation and stormwater runoff. These materials must be prevented from becoming a pollutant source.

NOTE: To prevent these materials from becoming a source of pollutants, construction and post-construction activities related to a project may be required to comply with applicable provision of rules related to solid, universal, and hazardous waste, including, but not limited to, the Maine solid waste and hazardous waste management rules; Maine hazardous waste management rules; Maine oil conveyance and storage rules; and Maine pesticide requirements.

5. Excavation de-watering: Excavation de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water removed from the ponded area, either through gravity or pumping, must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the Department.

NOTE: Dewatering controls are discussed in the “Maine Erosion and Sediment

6. Authorized Non-stormwater discharges: Identify and prevent contamination by non-stormwater discharges. Where allowed non-stormwater discharges exist, they must be identified and steps should be taken to ensure the implementation of appropriate pollution prevention measures for the non-stormwater component(s) of the discharge. Authorized non-stormwater discharges are:
 - a) Discharges from firefighting activity;
 - b) Fire hydrant flushings;
 - c) Vehicle washwater if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited);
 - d) Dust control runoff in accordance with permit conditions;
 - e) Routine external building washdown, not including surface paint removal, that does not involve detergents;
 - f) Pavement washwater (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material had been removed) if detergents are not used;
 - g) Uncontaminated air conditioning or compressor condensate;
 - h) Uncontaminated groundwater or spring water;
 - i) Foundation or footer drain-water where flows are not contaminated;
 - j) Uncontaminated excavation dewatering;
 - k) Potable water sources including waterline flushings; and
 - l) Landscape irrigation.
7. Unauthorized non-stormwater discharges: The Department’s approval under this Chapter does not authorize a discharge that is mixed with a source of non-stormwater, other than those discharges in compliance with 06-096 Chapter 500 - Appendix C (6). Specifically, the Department’s approval does not authorize discharges of the following:
 - a) Wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;
 - b) Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;
 - c) Soaps, solvents, or detergents used in vehicle and equipment washing; and
 - d) Toxic or hazardous substances from a spill or other release.
8. Additional requirements: Additional requirements may be applied on a site-specific basis.

Appendix A
Plans

Appendix B
Construction Inspection Forms

CONSTRUCTION INSPECTION FORM FOR EROSION AND SEDIMENT CONTROL						
General Information:						
Site Name:		Date:		Inspected by:		
Owner:						
Retained 3PI:		Last Rain Date:		Amount:		
Reason for Inspection:		Weekly	Winter	Final	Rain Event	Complaint
Description of disturbed area:						
Photos:						
	YES/NO/NA	COMMENTS				
1. Is an Erosion and Sediment Control Plan available?						
ESC plan on-site and followed						
Other:						
2. Are all erosion control practices installed properly, maintained and functioning?						
Disturbed areas stable						
Concentrated flow inlet/outlet protection						
All areas at final grade						
Disturbed dormant areas stabilized						
Access roads and parking						
Hillsides and stockpiles						
Other:						
3. Are all sedimentation control practices installed properly, maintained and functioning?						
Construction entrance						
Sedimentation basins/traps/diversions						
Perimeter controls						
Check dams						
Other:						
4. Is maintenance of ESC measures, construction activities and housekeeping kept-up?						
Sedimentation/erosion in ditches						
Tracked Sediment or dust at exits						
Hazardous material storage and spill control practices						
Waste management (concrete, hazardous material, etc.)						
Other:						
5. Violation, Corrective Actions, Recommendations						
Sediment discharged from site?						
Corrective action required?						
Site compliant with all permits?						
Notice of violation or stop work order issued?						
Comments/Corrective Actions (complete corrective actions before the next rain event and within 7 day)						

Appendix C
Post-Construction Inspection Forms

Barra Road Subdivision Biddeford Post-Construction Inspection Form (Ditches, Swales and Open Stormwater Channels)					
Project name:		Date:		Inspected by:	
Owner name:					
Last rain date:		Amount:			
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed
					Other (Specify)
General description of BMP condition/recent maintenance performed:					
Photos: (Attach)					
Inspection Details		Comments		Maintenance Required	
Obstructions, sediment or debris noticeable in ditch line?					
Mowing required?					
Woody vegetation apparent in ditches?					
Side slopes stable? Signs of slumping?					
Rip rap stable? Underlying filter fabric visible?					
Additional Comments:					

Barra Road Subdivision Biddeford Post-Construction Inspection Form (Roadway and Parking Areas)						
Project name:		Date:		Inspected by:		
Owner name:						
Last rain date:		Amount:				
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
General description of BMP condition/recent maintenance performed:						
Photos: (Attach)						
Inspection Details		Comments		Maintenance Required		
Winter sand accumulation apparent?						
Pavement Sweeping required?						
Gravel shoulders graded appropriately?						
Gravel road grading required?						
Low spots causing puddling?						
Additional Comments:						

Barra Road Subdivision Biddeford Post-Construction Inspection Form (Storm Drain System including culverts)					
Project name:		Date:		Inspected by:	
Owner name:					
Last rain date:		Amount:			
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed Other (Specify)
General description of BMP condition/recent maintenance performed:					
Photos: (Attach)					
Inspection Details		Comments		Maintenance Required	
Accumulated debris or sediment at inlet, outlet, or within culvert/storm drain?					
Flow obstructions present?					
Erosion apparent at culvert inlet/outlet?					
Additional Comments:					

Barra Road Subdivision Biddeford Post-Construction Inspection Form (Underdrain Filter)					
Project name:		Date:		Inspected by:	
Owner name:					
Last rain date:		Amount:			
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed
					Other (Specify)
General description of BMP condition/recent maintenance performed:					
Photos: (Attach)					
Inspection Details		Comments		Maintenance Required	
Debris apparent in basin bottom?					
Vegetation established in basin bottom?					
Basin draining within 72 hours?					
Inlet forebay rip rap stable and free of debris?					
Embankment and side slopes stable? Sloughs or unvegetated areas apparent?					
Outlet free of debris? Rip rap stable?					
Valve in operating condition?					
Outlet control structure operational free of debris?					
Orifice free of debris and operational?					
Additional Comments:					

Barra Road Subdivision Biddeford Post-Construction Inspection Form (Vegetated Area)					
Project name:		Date:		Inspected by:	
Owner name:					
Last rain date:		Amount:			
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed
					Other (Specify)
General description of BMP condition/recent maintenance performed:					
Photos: (Attach)					
Inspection Details		Comments		Maintenance Required	
All slopes and embankments well vegetated? Signs of sparse growth?					
Rill erosion apparent in vegetated areas?					
Downs slope of level spreaders/ditch turnouts stable?					
Mowing of vegetated areas appropriate?					
Additional Comments:					

Appendix D
Inspection Frequency Checklist and Long-Term Inspection & Maintenance Plan

EROSION AND SEDIMENT CONTROL MEASURES AND ACTIVITY	INSPECTION FREQUENCY		
	Weekly	Before and After a Storm	After Construction
SEDIMENT BARRIERS			
Sediment barriers are installed prior to soil disturbances	X	X	
Silt fences are keyed in and tight	X	X	
Barriers are repaired and replaced as necessary	X	X	
Barriers are removed when the site is stabilized - Silt fence should be cut at the ground surface			X
TEMPORARY STABILIZATION			
Areas are stabilized if idle for 14 days or more	X	X	
Daily stabilization within 100 ft of a natural resource	X	X	
MULCH			
Seed and mulch within 7 days of final grading. Ground is not visible	X	X	
Erosion control mix is 4-6 inch thick	X	X	
Erosion control blankets or hay mulch are anchored	X	X	
VEGETATION			
Vegetation provides 90% soil cover	X		X
Loam or soil amendment were provided	X		X
New seeded areas are mulched and protected from vehicle, foot traffic and runoff	X	X	X
Areas that will remain unworked for more than 1 year are vegetated with grass	X		
SLOPES AND EMBANKMENTS			
Final graded slopes and embankments are stabilized	X	X	X
Diversions are provided for areas with rill erosion	X	X	X
Areas steeper than 2:1 are riprapped	X		
Stones are angular, durable and various in size	X		
Riprap is underlain with a gravel layer or filter fabric	X		
STORMWATER CHANNELS AND CULVERTS			
Ditches and swales are permanently stabilized—channels that will be riprapped have been over-excavated	X	X	X
Ditches are clear of obstructions, accumulated sediments or debris	X	X	X
Ditch lining/bottoms are free of erosion	X	X	X
Check dams are spaced correctly to slow flow velocity	X		
Underlying filter fabric or gravel is not visible	X	X	X
Culvert aprons and plunge pools are sized for expected flows volume and velocity	X		
Stones are angular, durable and various in size	X		
Culverts are sized to avoid upgradient flooding	X	X	
Culvert protection extends to the maximum flow elevation within the ditch	X	X	X
Culvert is embedded, not hanging	X	X	X

ROADWAYS AND PARKING SURFACES			
The gravel pad at the construction entrance is clear from sediments	X	X	
Roads are graded to drain		X	X
Cross drainage (culvert) is provided	X		
False ditches (from winter sand) are graded		X	X
BUFFERS			
Buffers are free of erosion or concentrated flows		X	X
The downgradient of spreaders and turnouts is stable		X	X
Level spreaders are on the contour			X
The number of spreaders and ditch turnouts is adequate for flow distribution		X	X
Any sediment accumulation is removed from within spreader or turnouts		X	X
WINTER CONSTRUCTION (November 1st-April 15th)			
Final graded areas are mulched daily at twice the normal rate with hay, and anchor (not on snow)	Daily		
A double row of sediment barrier is provided for all areas within 100 ft of a sensitive resource (use erosion control mix on frozen ground)	Daily		
Newly constructed ditches are riprapped	Daily		
Slopes greater than 8% are covered with an erosion control blanket or a 4-inch layer of erosion control mix	Daily		
HOUSEKEEPING PUNCH LIST			
All disturbed areas are permanently stabilized, and plantings are established (grass seeds have germinated with 90% vegetative cover)			X
All trash, sediments, debris or any solid waste have been removed from stormwater channels, catch basins, detention structures, discharge points, etc.			X
All ESC devices have been removed: (silt fence and posts, diversions and sediment structures, etc.)			X
All deliverables (certifications, survey information, as-built plans, reports, notice of termination (NOT), etc.) in accordance with all permit requirements have been submitted to town, Maine DEP, association, owner, etc.			X

INSPECTION AND MAINTENANCE PLAN FOR STORMWATER MANAGEMENT STRUCTURES (BMPS)

	INSPECTION SCHEDULE	CORRECTIVE ACTIONS
VEGETATED AREAS	Annually early spring and after heavy rains	Inspect all slopes and embankments and replant areas of bare soil or with sparse growth
		Armor rill erosion areas with riprap or divert the runoff to a stable area
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Mow vegetation as specified for the area
DITCHES, SWALES AND OPEN STORMWATER CHANNELS	Annually spring and late fall and after heavy rains	Remove obstructions, sediments or debris from ditches, swales and other open channels
		Repair any erosion of the ditch lining
		Mow vegetated ditches
		Remove woody vegetation growing through riprap
		Repair any slumping side slopes
		Repair riprap where underlying filter fabric or gravel is showing or if stones have dislodge
CULVERTS	Spring and late fall and after heavy rains	Remove accumulated sediments and debris at the inlet, outlet, or within the conduit
		Remove any obstruction to flow
		Repair any erosion damage at the culvert's inlet and outlet
ROADWAYS AND PARKING AREAS	Annually in the spring or as needed	Clear and remove accumulated winter sand in parking lots and along roadways
		Sweep pavement to remove sediment
		Grade road shoulders and remove accumulated winter sand
		Grade gravel roads and gravel shoulders
		Clean out the sediment within water bars or open-top culverts
RESOURCE AND TREATMENT BUFFERS	Annually in the spring	Ensure that stormwater runoff is not impeded by false ditches of sediment in the shoulder
		Inspect buffers for evidence of erosion, concentrated flow, or encroachment by development
		Manage the buffer's vegetation with the requirements in any deed restrictions
		Repair any sign of erosion within a buffer
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Install more level spreaders, or ditch turn-outs if needed for a better distribution of flow
OTHER PRACTICES	As specified for devices	Clean out any accumulation of sediment within the spreader bays or turnout pools
		Mow non-wooded buffers no shorter than six inches and less than three times per year
		Contact the department for appropriate inspection and maintenance requirements for other drainage control and runoff treatment measures.

Appendix E
Post Construction – Maintenance of Stormwater Management Systems

FIVE-YEAR RECERTIFICATION FOR LONG-TERM MAINTENANCE OF STORMWATER MANAGEMENT SYSTEMS

For Site Location & Stormwater Projects

This form complies with the condition that requires reporting every 5 years on the long-term maintenance of stormwater management structures of projects permitted under the Stormwater Management Law since 2005. Complete the following sections, include inspection photos, and use additional paper if needed. A copy of the report if the inspection was performed by a professional experienced in BMP maintenance should be included. Electronic copy of this form and information about the five-year recertification are available on the Maine DEP website at: <http://www.maine.gov/dep/land/stormwater/stormwaterbmps/>

Please type or print in black ink only			
Owner/Licensee		3rd Party Inspection Company (if applicable)	
Name of Representative:		Name of Inspector or preparer of report:	
Company:		Company:	
Mailing Address:		Mailing Address:	
Daytime Phone #:		Daytime Phone #:	
E-mail Address:		E-mail Address:	

LOCATION OF DEVELOPMENT			
Name of Project:			
Address and Town:			
DEP Permit Number:		Year of Permit:	

PROJECT SPECIFICS	
If the project is unfinished, please describe its current status and your plans for the future. The filing of this report of on-site long-term maintenance activities is still required.	
If the project is within a MPDES Regulated Town, the maintenance report prepared for the town should be submitted with this form.	
If the project is a subdivision with a Homeowner's association, identify the responsible party.	
Confirm that the required recording of deed restrictions for the protection of buffers or conservation land has been done, and that the buffers are maintained according to the restrictions.	
Identify the contractor for the required renewal of a 5-year maintenance contract for the inspection, cleaning and maintenance of manufactured proprietary structures.	
Is a maintenance log available for review?	

LONG-TERM MAINTENANCE (please comment on the following):

All areas of the development have been inspected for erosion, and appropriate steps have been taken to permanently stabilize these areas.

All stormwater control structures have been inspected for damage, wear, malfunction, and appropriate steps have been taken to repair or replace the failing systems.

The erosion control and stormwater maintenance plan for the site is being implemented as written, and a maintenance log has been created and is being maintained.

CERTIFICATIONS/SIGNATURES

By signing below, the owner (or authorized agent) certifies that all stormwater management structures at the project described above are stable and operational as designed.

Signed: _____ Title _____ Date: _____

This completed form and all supporting documents summarized above shall be sent to the following address. An emailed report is appropriate and should be sent to Recert-DEP@maine.gov

Five-year Recertification
Bureau of Land Resources
17 State House Station
Augusta, ME 04333
Tel: (207) 287-2624 or (207) 287-2602

Appendix F
Post Construction – City of Biddeford Annual Stormwater Management Facilities
Certification Forms

ENVIRONMENT

34 Attachment 2

City of Biddeford

Appendix 1

**Annual Stormwater Management Facilities Certification (to be sent to City's
Enforcement Authority)
[Amended 6-20-2023 by Ord. No. 2023.61¹]**

- I, _____ (print or type name), certify the following:
1. I am making this Annual Stormwater Management Facilities Certification for the following property:
_____ (print or type name of subdivision, condominium or other
development) located at _____ (print or type address), (the
"Property");
 2. The owner, operator, tenant, lessee or homeowners' association of the Property is: _____
(name(s) of owner, operator, tenant, lessee, homeowners' association or other party having control
over the Property);
 3. I am (check one)
 - a. _____ the owner, operator, tenant, lessee or president of the homeowners' association and have
hired a Qualified Post Construction Stormwater Inspector; or
 - b. _____ am a Qualified Post-Construction Stormwater Inspector hired by the person identified in
item two of this form;
 4. I have knowledge of erosion and stormwater control and have reviewed the approved Post-
Construction Stormwater Management Plan for the Property;
 5. On _____, 20 _____, I inspected or had inspected by a Qualified Post-Construction
Stormwater Inspector, the Stormwater Management Facilities, including but not limited to parking
areas, catch basins, drainage swales, detention basins and ponds, pipes and related structures required
by the approved Post-Construction Stormwater Management Plan for the Property;
 6. I have attached a copy of the Annual Inspection Report. At the time of the inspection (check one and
complete any required information):
 - a. The Stormwater Management Facilities were adequately maintained and functioning as
intended; or
 - b. The Stormwater Management Facilities required maintenance, which was completed within the
required sixty-day time period, and were functioning as intended after maintenance was
completed; or
 - c. The Stormwater Management Facilities required maintenance which was not completed within
the required sixty-day time period. (Attach additional sheets as necessary to describe the
maintenance required, proposed schedule for completion, and an appropriate contact person.
The City will contact them to confirm or adjust the schedule to complete the maintenance and
any needed further course of action. You will be required to show proof of final maintenance.)

¹ Editor's Note: This ordinance also repealed former Appendix 1, Maintenance Agreement for
Stormwater Management Facilities, and redesignated former Appendix 2 as Appendix 1.

BIDDEFORD CODE

Date: _____, 20.

By: _____

Signature

Print Name

Mail this certification to the City's Enforcement Authority at the following address [to be completed by the municipality]: _____

**EROSION AND SEDIMENTATION CONTROL
INSPECTION AND MAINTENANCE PLAN**

**Avesta Housing
Barra Road
Biddeford, Maine**

Submitted by:

**Avesta Housing
307 Cumberland Avenue
Portland, ME**

Prepared by:



Date:
July 2024

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APPENDIX C	Post-Construction Inspection Forms
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APPENDIX F	Post Construction – City of Biddeford Annual Stormwater Management Facilities Certification Forms

1.0 INTRODUCTION

The intent of this plan is to establish inspection and maintenance procedures to be implemented for erosion and sediment control best management practices (BMP's) during construction, as well as for post-construction stormwater BMP's, for a 46-unit affordable elderly housing project for Avesta Housing. This plan has been prepared in conformance with the requirements set forth in 06-096 Chapter 500 – Stormwater Management, and the City of Biddeford Post-Construction Stormwater Management requirements.

1.1 PROJECT DESCRIPTION

The applicant, Avesta Housing, is proposing a 46-unit apartment building off the end of Barra Road in Biddeford, Maine. This project is proposed as part of a subdivision by Indian Cliff Development Corp. on Lot A of the subdivision approximately 2.2 acres in size. The project is required to obtain a Stormwater Law Permit from the Maine DEP and a Site and Subdivision Permit from the City of Biddeford.

The scope of work includes but is not limited to:

- Tree clearing
- Stumping, grubbing and subgrade preparation.
- Grading of lot and construction of access and parking
- Construction of a 46-unit 4 story apartment building
- Construction of public utilities
- Construction of stormwater BMP's

The proposed development will create approximately 0.84 acres of new impervious area.

1.2 REQUIRED PERMITS

The following is a list of Municipal, State, and Federal permits that are required for the Project:

Municipal

City of Biddeford Site and Subdivision Permits

State of Maine

Maine DEP Stormwater Law Permit

1.3 **REFERENCES**

This plan has been developed in accordance with the following:

- Stormwater Management Law 38 M.R.S. §420-C and §420-D
<http://legislature.maine.gov/statutes/38/title38sec420-C.html>
<http://legislature.maine.gov/statutes/38/title38sec420-D.html>
- 06-096 Chapter 500 – Stormwater Management
<http://www.maine.gov/sos/cec/rules/06/096/096c500.docx>
- General Permit – Construction Activity
Maine Pollutant Discharge Elimination System (MPDES)
<https://www.maine.gov/dep/land/stormwater/construction.html>
- Maine Erosion and Sediment Control Best Management Practices (BMPs)
Manual for Designers and Engineers
https://www.maine.gov/dep/land/erosion/escbmps/esc_bmp_engineers.pdf
- Maine Erosion and Sediment Control Practices Field Guide for Contractors
https://www.maine.gov/dep/land/erosion/escbmps/esc_bmp_field.pdf
- MaineDOT Best Management Practices for Erosion and Sedimentation Control
<https://www.maine.gov/mdot/env/documents/bmp/BMP2008full.pdf>
- City of Biddeford Maine Ordinances
<https://ecode360.com/BI3074>

1.4 **RESPONSIBLE PARTIES**

Preparer/Design Engineer:	Christopher MacDonald, PE BH2M 380B Main Street Gorham, ME 04038 (207) 839-2771
Developer/Applicant:	Avesta Housing 307 Cumberland Avenue Portland, ME
Site Contractor:	<u>TBD</u> _____ _____
Owner:	Indian Cliff Development Corp. 260 Main Street P.O. Box 444 Biddeford, Maine
Post Construction Stormwater Inspector:	<u>Avesta Housing</u> _____ _____
Stormwater Maintenance	<u>Avesta Housing</u> _____ _____
During Construction:	<u>Avesta Housing</u> _____ _____
Post Construction:	<u>Avesta Housing</u> _____ _____

During construction, the Developer/Applicant or their representatives will be responsible for implementing the erosion and sediment control BMP's as well routine inspections and maintenance of the BMP's.

Post-construction stormwater BMP inspection, maintenance, reporting, and required recertifications will be the responsibility of the property owner.

1.5 INSPECTION AND MAINTENANCE – DURING CONSTRUCTION

Anyone who conducts or directs an activity that involves exposing, filling or displacing soil or other earthen materials should take appropriate measures to prevent erosion and the loss of sediment beyond the project site or into a sensitive resource. Erosion and sediment control measures should be in place before the activity begins and should remain functional until the site is permanently stabilized. All measures should remain effective until all areas are permanently stabilized. Any disturbed area should be regularly inspected until the site is fully stabilized with either 90% grass cover or a permanent impervious surface such as pavement. A person who has the knowledge of erosion and sediment control measures and of stormwater management practices should inspect the site at a minimum once a week, and before and after a storm event. Any failing measure should be repaired or modified to adequately stabilize the site prior to the next storm event or no later than 7 calendar days. The inspection frequency table found in Appendix D shall be used as a guide for inspecting each specific BMP. The inspection form found in Appendix B shall be used to record the inspection, its outcome, and the required maintenance.

Refer to the Plans found in Appendix A for additional erosion and sediment control details and narratives.

General Inspection, Maintenance, and Documentation Requirements

1. Inspection and corrective action: Inspect disturbed and impervious areas, erosion control measures, and material storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. Inspect these areas at least once a week as well as before and within 24 hours after a storm event, and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections.
2. Maintenance: If BMP's need to be repaired, the repair work should be initiated upon discovery of the problem but no later than the end of the next workday. If additional BMPs or significant repair of BMPs are necessary, implementation must be completed within 7 calendar days and prior to any storm event. All measures must be maintained in effective operating condition until areas are permanently stabilized.
3. Documentation: Maintain a binder with construction inspection forms summarizing the inspections and any corrective action taken. The forms must include the name and qualifications of the person making the inspections, the date of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicle access points to the parcel. Refer to Appendix B for the construction inspection form. Major observations must include BMP's that need maintenance, BMP's that failed to

operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the inspection form what corrective action taken and when it was taken. The Owner shall retain a copy of the inspection forms for a period of at least five years from the completion of permanent stabilization.

Site-Specific BMP's

Refer to Appendix D for inspection and maintenance requirements and frequencies of site-specific BMP's. Refer to the Plans found in Appendix A for narratives and details of the site-specific BMP's. The following is a list of the site-specific BMP's that will require routine inspection and maintenance:

- Sedimentation Barriers (Silt Fence or Erosions Control Mix Berm)
- Stabilized Construction Entrance
- Construction Limit Barrier Fence
- Stone Check Dam
- Temporary Sediment Trap
- Temporary Grass/Stone Lined Swale
- Roadways
- Snow Storage Areas
- Sediment Forebays
- Pipe Outlets
- Grassed Underdrained Soil Filter

Winter Construction

Winter construction is construction activity performed during the period from November 1 through April 15. If disturbed areas are not stabilized with permanent measures by November 1 or new soil disturbance occurs after November 1, but before April 15, then these areas must be protected and runoff from them must be controlled by additional measures and restrictions.

1. Site Stabilization: For winter stabilization, hay mulch is applied at twice the standard temporary stabilization rate. At the end of each construction day, areas that have been brought to final grade must be stabilized. Mulch may not be spread on top of snow.
2. Sediment Barriers: All areas within 75 feet of a protected natural resource must be protected with a double row of sediment barriers.
3. Ditches: All vegetated ditch lines that have not been stabilized by November 1, or will be worked during the winter construction period, must be stabilized with an appropriate stone lining backed by an appropriate gravel bed or geotextile unless specifically released from this standard by Maine DEP.

-
4. Slopes: Mulch netting must be used to anchor mulch on all slopes greater than 8% unless erosion control blankets or erosion control mix is being used on these slopes.

Refer to the Plans contained in Appendix A for additional winter construction erosion and sediment control requirements.

1.6 INSPECTION AND MAINTENANCE – POST-CONSTRUCTION

The long-term operation and maintenance of a stormwater management system is as critical to its performance as its design and construction. Proper operation and maintenance practices ensure that stormwater BMP's continue to improve water quality by removing pollutants effectively over the long-term and decreasing the risk of re-suspending sediment. Without proper maintenance, BMPs are likely to fail and will no longer provide treatment of stormwater. The following includes a summary of the inspection, maintenance, and documentation requirements for post-construction stormwater BMP's.

Refer to the Plans contained in Appendix A for details and locations of site-specific post-construction BMP's and Appendix F for Annual Stormwater Management Facilities Certification form for the City of Biddeford. See section 5. below for addition information on City requirements.

General Inspection, Maintenance, and Documentation Requirements

1. Inspection and maintenance: All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections. The following areas, facilities, and measures must be inspected and identified deficiencies must be corrected. Areas, facilities, and measures other than those listed below may also require inspection on a specific site.
 - a) Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after significant rainfall events (1 inch in 24-hour period) to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.
 - b) Inspect ditches, swales and other open stormwater channels in the spring, in late fall, and after significant rainfall events (1 inch in 24-hour period) to remove any obstructions to flow, remove accumulated sediments and debris, to control vegetated growth that could obstruct flow, and to repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If

the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or side slopes.

- c) Inspect culverts in the spring, in late fall, and after heavy rains to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.
- d) Inspect at least once per year, each underdrained soil filter, including the filter embankments, vegetation, underdrain piping, and overflow spillway. Remove and dispose of accumulated sediments in the filter. If needed, rehabilitate any clogged surface linings, and flush underdrain piping.

2. Regular maintenance

- 1. Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader. Grading of gravel roads, or grading of the gravel shoulders of gravel or paved roads, must be routinely performed to ensure that stormwater drains immediately off the road surface to adjacent buffer areas or stable ditches, and is not impeded by accumulations of graded material on the road shoulder or by excavation of false ditches in the shoulder. If water bars or open-top culverts are used to divert runoff from road surfaces, clean-out any sediments within or at the outlet of these structures to restore their function.
- 3. Documentation: Maintain a binder of inspection forms summarizing inspection, maintenance, and any corrective actions taken. The inspection forms must include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. Refer to Appendix C for inspection forms. If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed of after removal. The log must be made accessible to Department staff and a copy provided to the Department upon request. The Owner shall retain a copy of the logs for a period of at least five years from the completion of permanent stabilization.
- 4. The site-specific post-construction BMP's for the project include the following:
 - Vegetated swales
 - Roadways and shoulders

-
- Storm Drain System
 - Snow storage areas
 - Rip rap inlet and outlet aprons
 - Sediment forebay
 - Pipe outlets
 - Grassed Underdrained Soil Filter
5. The City of Biddeford requires that annual inspections of the stormwater facilities be made on a yearly basis by a Qualified Post-Construction Stormwater Inspector, with annual inspections being reported to the City Engineer by March 1st of each year, per Chapter 34 Article VI “Post-Construction Stormwater Discharge” of the City’s code of Ordinances. See Attachment F for the current copy the Annual Stormwater Management Facilities Certification form for use in reporting these inspections to the City.

1.7 **HOUSEKEEPING**

The following performance standards shall apply:

1. Spill prevention: Controls must be used to prevent pollutants from construction and waste materials stored on site to enter stormwater, which includes storage practices to minimize exposure of the materials to stormwater. The site contractor or operator must develop and implement as necessary appropriate spill prevention, containment, and response planning measures.

NOTE: Any spill or release of toxic or hazardous substances must be reported to the Department. For oil spills, call 1-800-482-0777 which is available 24 hours a day. For

spills of toxic or hazardous material, call 1-800-452-4664 which is available 24 hours a day. For more information, visit the Department’s website at :

<http://www.maine.gov/dep/spills/emergspillresp/>

2. Groundwater protection: During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials. Any project proposing infiltration of stormwater must provide adequate pre-treatment of stormwater prior to discharge of stormwater to the infiltration area, or provide for treatment within the infiltration area in order to prevent the accumulation of fines, reduction in infiltration rate, and consequent flooding and destabilization.

See 06-096 Chapter 500 - Appendix D for license by rule standards for infiltration of stormwater.

NOTE: Lack of appropriate pollutant removal best management practices (BMPs) may result in violations of the groundwater quality standard established by 38 M.R.S.A. §465-C(1).

3. Fugitive sediment and dust: Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control, but other water additives may be considered as needed. A stabilized construction entrance (SCE) should be included to minimize tracking of mud and sediment. If off-site tracking occurs, public roads should be swept immediately, no less than once a week, and prior to significant storm events. Operations during dry months that experience fugitive dust problems, should wet down unpaved access roads once a week or more frequently as needed with a water additive to suppress fugitive sediment and dust.

NOTE: Take care in sourcing water. Dewatering a stream without a permit from the Department may violate state water quality standards and the *Natural Resources Protection Act*.

4. Debris and other materials: Minimize the exposure of construction debris, building and landscaping materials, trash, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials to precipitation and stormwater runoff. These materials must be prevented from becoming a pollutant source.

NOTE: To prevent these materials from becoming a source of pollutants, construction and post-construction activities related to a project may be required to comply with applicable provision of rules related to solid, universal, and hazardous waste, including, but not limited to, the Maine solid waste and hazardous waste management rules; Maine hazardous waste management rules; Maine oil conveyance and storage rules; and Maine pesticide requirements.

5. Excavation de-watering: Excavation de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water removed from the ponded area, either through gravity or pumping, must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the Department.

NOTE: Dewatering controls are discussed in the “Maine Erosion and Sediment Control BMPs, Maine Department of Environmental Protection.”

-
6. Authorized Non-stormwater discharges: Identify and prevent contamination by non-stormwater discharges. Where allowed non-stormwater discharges exist, they must be identified and steps should be taken to ensure the implementation of appropriate pollution prevention measures for the non- stormwater component(s) of the discharge. Authorized non-stormwater discharges are:
- a) Discharges from firefighting activity;
 - b) Fire hydrant flushings;
 - c) Vehicle washwater if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited);
 - d) Dust control runoff in accordance with permit conditions;
 - e) Routine external building washdown, not including surface paint removal, that does not involve detergents;
 - f) Pavement washwater (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material had been removed) if detergents are not used;
 - g) Uncontaminated air conditioning or compressor condensate;
 - h) Uncontaminated groundwater or spring water;
 - i) Foundation or footer drain-water where flows are not contaminated;
 - j) Uncontaminated excavation dewatering;
 - k) Potable water sources including waterline flushings; and
 - l) Landscape irrigation.
7. Unauthorized non-stormwater discharges: The Department's approval under this Chapter does not authorize a discharge that is mixed with a source of non-stormwater, other than those discharges in compliance with 06-096 Chapter 500 - Appendix C (6). Specifically, the Department's approval does not authorize discharges of the following:
- a) Wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;
 - b) Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;
 - c) Soaps, solvents, or detergents used in vehicle and equipment washing; and
 - d) Toxic or hazardous substances from a spill or other release.
8. Additional requirements: Additional requirements may be applied on a site-specific basis.

Appendix A
Plans

Appendix B
Construction Inspection Forms

CONSTRUCTION INSPECTION FORM FOR EROSION AND SEDIMENT CONTROL						
General Information:						
Site Name:		Date:		Inspected by:		
Owner:						
Retained 3PI:		Last Rain Date:			Amount:	
Reason for Inspection:		Weekly	Winter	Final	Rain Event	Complaint
Description of disturbed area:						
Photos:						
	YES/NO/NA	COMMENTS				
1. Is an Erosion and Sediment Control Plan available?						
ESC plan on-site and followed						
Other:						
2. Are all erosion control practices installed properly, maintained and functioning?						
Disturbed areas stable						
Concentrated flow inlet/outlet protection						
All areas at final grade						
Disturbed dormant areas stabilized						
Access roads and parking						
Hillsides and stockpiles						
Other:						
3. Are all sedimentation control practices installed properly, maintained and functioning?						
Construction entrance						
Sedimentation basins/traps/diversions						
Perimeter controls						
Check dams						
Other:						
4. Is maintenance of ESC measures, construction activities and housekeeping kept-up?						
Sedimentation/erosion in ditches						
Tracked Sediment or dust at exits						
Hazardous material storage and spill control practices						
Waste management (concrete, hazardous material, etc.)						
Other:						
5. Violation, Corrective Actions, Recommendations						
Sediment discharged from site?						
Corrective action required?						
Site compliant with all permits?						
Notice of violation or stop work order issued?						
Comments/Corrective Actions (complete corrective actions before the next rain event and within 7 day)						

Appendix C
Post-Construction Inspection Forms

Avesta Housing Biddeford Post-Construction Inspection Form (Ditches, Swales and Open Stormwater Channels)					
Project name:		Date:		Inspected by:	
Owner name:					
Last rain date:		Amount:			
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed
					Other (Specify)
General description of BMP condition/recent maintenance performed:					
Photos: (Attach)					
Inspection Details		Comments		Maintenance Required	
Obstructions, sediment or debris noticeable in ditch line?					
Mowing required?					
Woody vegetation apparent in ditches?					
Side slopes stable? Signs of slumping?					
Rip rap stable? Underlying filter fabric visible?					
Additional Comments:					

Avesta Housing Biddeford Post-Construction Inspection Form (Roadway and Parking Areas)						
Project name:		Date:		Inspected by:		
Owner name:						
Last rain date:		Amount:				
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
General description of BMP condition/recent maintenance performed:						
Photos: (Attach)						
Inspection Details		Comments		Maintenance Required		
Winter sand accumulation apparent?						
Pavement Sweeping required?						
Gravel shoulders graded appropriately?						
Gravel road grading required?						
Low spots causing puddling?						
Additional Comments:						

Avesta Housing Biddeford Post-Construction Inspection Form (Storm Drain System including culverts)						
Project name:		Date:		Inspected by:		
Owner name:						
Last rain date:		Amount:				
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
General description of BMP condition/recent maintenance performed:						
Photos: (Attach)						
Inspection Details		Comments		Maintenance Required		
Accumulated debris or sediment at inlet, outlet, or within culvert/storm drain?						
Flow obstructions present?						
Erosion apparent at culvert inlet/outlet?						
Additional Comments:						

Avesta Housing Biddeford Post-Construction Inspection Form (Underdrain Filter)						
Project name:		Date:		Inspected by:		
Owner name:						
Last rain date:		Amount:				
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
General description of BMP condition/recent maintenance performed:						
Photos: (Attach)						
Inspection Details		Comments		Maintenance Required		
Debris apparent in basin bottom?						
Vegetation established in basin bottom?						
Basin draining within 72 hours?						
Inlet forebay rip rap stable and free of debris?						
Embankment and side slopes stable? Sloughs or unvegetated areas apparent?						
Outlet free of debris? Rip rap stable?						
Valve in operating condition?						
Outlet control structure operational free of debris?						
Orifice free of debris and operational?						
Additional Comments:						

Avesta Housing Biddeford Post-Construction Inspection Form (Vegetated Area)					
Project name:		Date:		Inspected by:	
Owner name:					
Last rain date:		Amount:			
Reason for inspection:		Rain Event	Monthly	Annually	Maint. Performed
					Other (Specify)
General description of BMP condition/recent maintenance performed:					
Photos: (Attach)					
Inspection Details		Comments		Maintenance Required	
All slopes and embankments well vegetated? Signs of sparse growth?					
Rill erosion apparent in vegetated areas?					
Downs slope of level spreaders/ditch turnouts stable?					
Mowing of vegetated areas appropriate?					
Additional Comments:					

Appendix D
Inspection Frequency Checklist and Long-Term Inspection & Maintenance Plan

EROSION AND SEDIMENT CONTROL MEASURES AND ACTIVITY	INSPECTION FREQUENCY		
	Weekly	Before and After a Storm	After Construction
SEDIMENT BARRIERS			
Sediment barriers are installed prior to soil disturbances	X	X	
Silt fences are keyed in and tight	X	X	
Barriers are repaired and replaced as necessary	X	X	
Barriers are removed when the site is stabilized - Silt fence should be cut at the ground surface			X
TEMPORARY STABILIZATION			
Areas are stabilized if idle for 14 days or more	X	X	
Daily stabilization within 100 ft of a natural resource	X	X	
MULCH			
Seed and mulch within 7 days of final grading. Ground is not visible	X	X	
Erosion control mix is 4-6 inch thick	X	X	
Erosion control blankets or hay mulch are anchored	X	X	
VEGETATION			
Vegetation provides 90% soil cover	X		X
Loam or soil amendment were provided	X		X
New seeded areas are mulched and protected from vehicle, foot traffic and runoff	X	X	X
Areas that will remain unworked for more than 1 year are vegetated with grass	X		
SLOPES AND EMBANKMENTS			
Final graded slopes and embankments are stabilized	X	X	X
Diversions are provided for areas with rill erosion	X	X	X
Areas steeper than 2:1 are riprapped	X		
Stones are angular, durable and various in size	X		
Riprap is underlain with a gravel layer or filter fabric	X		
STORMWATER CHANNELS AND CULVERTS			
Ditches and swales are permanently stabilized—channels that will be riprapped have been over-excavated	X	X	X
Ditches are clear of obstructions, accumulated sediments or debris	X	X	X
Ditch lining/bottoms are free of erosion	X	X	X
Check dams are spaced correctly to slow flow velocity	X		
Underlying filter fabric or gravel is not visible	X	X	X
Culvert aprons and plunge pools are sized for expected flows volume and velocity	X		
Stones are angular, durable and various in size	X		
Culverts are sized to avoid upgradient flooding	X	X	
Culvert protection extends to the maximum flow elevation within the ditch	X	X	X
Culvert is embedded, not hanging	X	X	X

ROADWAYS AND PARKING SURFACES			
The gravel pad at the construction entrance is clear from sediments	X	X	
Roads are graded to drain		X	X
Cross drainage (culvert) is provided	X		
False ditches (from winter sand) are graded		X	X
BUFFERS			
Buffers are free of erosion or concentrated flows		X	X
The downgradient of spreaders and turnouts is stable		X	X
Level spreaders are on the contour			X
The number of spreaders and ditch turnouts is adequate for flow distribution		X	X
Any sediment accumulation is removed from within spreader or turnouts		X	X
WINTER CONSTRUCTION (November 1st-April 15th)			
Final graded areas are mulched daily at twice the normal rate with hay, and anchor (not on snow)	Daily		
A double row of sediment barrier is provided for all areas within 100 ft of a sensitive resource (use erosion control mix on frozen ground)	Daily		
Newly constructed ditches are riprapped	Daily		
Slopes greater than 8% are covered with an erosion control blanket or a 4-inch layer of erosion control mix	Daily		
HOUSEKEEPING PUNCH LIST			
All disturbed areas are permanently stabilized, and plantings are established (grass seeds have germinated with 90% vegetative cover)			X
All trash, sediments, debris or any solid waste have been removed from stormwater channels, catch basins, detention structures, discharge points, etc.			X
All ESC devices have been removed: (silt fence and posts, diversions and sediment structures, etc.)			X
All deliverables (certifications, survey information, as-built plans, reports, notice of termination (NOT), etc.) in accordance with all permit requirements have been submitted to town, Maine DEP, association, owner, etc.			X

INSPECTION AND MAINTENANCE PLAN FOR STORMWATER MANAGEMENT STRUCTURES (BMPS)

	INSPECTION SCHEDULE	CORRECTIVE ACTIONS
VEGETATED AREAS	Annually early spring and after heavy rains	Inspect all slopes and embankments and replant areas of bare soil or with sparse growth
		Armor rill erosion areas with riprap or divert the runoff to a stable area
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Mow vegetation as specified for the area
DITCHES, SWALES AND OPEN STORMWATER CHANNELS	Annually spring and late fall and after heavy rains	Remove obstructions, sediments or debris from ditches, swales and other open channels
		Repair any erosion of the ditch lining
		Mow vegetated ditches
		Remove woody vegetation growing through riprap
		Repair any slumping side slopes
		Repair riprap where underlying filter fabric or gravel is showing or if stones have dislodge
CULVERTS	Spring and late fall and after heavy rains	Remove accumulated sediments and debris at the inlet, outlet, or within the conduit
		Remove any obstruction to flow
		Repair any erosion damage at the culvert's inlet and outlet
ROADWAYS AND PARKING AREAS	Annually in the spring or as needed	Clear and remove accumulated winter sand in parking lots and along roadways
		Sweep pavement to remove sediment
		Grade road shoulders and remove accumulated winter sand
		Grade gravel roads and gravel shoulders
		Clean out the sediment within water bars or open-top culverts
RESOURCE AND TREATMENT BUFFERS	Annually in the spring	Ensure that stormwater runoff is not impeded by false ditches of sediment in the shoulder
		Inspect buffers for evidence of erosion, concentrated flow, or encroachment by development
		Manage the buffer's vegetation with the requirements in any deed restrictions
		Repair any sign of erosion within a buffer
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Install more level spreaders, or ditch turn-outs if needed for a better distribution of flow
OTHER PRACTICES	As specified for devices	Clean out any accumulation of sediment within the spreader bays or turnout pools
		Mow non-wooded buffers no shorter than six inches and less than three times per year
		Contact the department for appropriate inspection and maintenance requirements for other drainage control and runoff treatment measures.

Appendix E
Post Construction – Maintenance of Stormwater Management Systems

FIVE-YEAR RECERTIFICATION FOR LONG-TERM MAINTENANCE OF STORMWATER MANAGEMENT SYSTEMS

For Site Location & Stormwater Projects

This form complies with the condition that requires reporting every 5 years on the long-term maintenance of stormwater management structures of projects permitted under the Stormwater Management Law since 2005. Complete the following sections, include inspection photos, and use additional paper if needed. A copy of the report if the inspection was performed by a professional experienced in BMP maintenance should be included. Electronic copy of this form and information about the five-year recertification are available on the Maine DEP website at: <http://www.maine.gov/dep/land/stormwater/stormwaterbmps/>

Please type or print in black ink only			
Owner/Licensee		3rd Party Inspection Company (if applicable)	
Name of Representative:		Name of Inspector or preparer of report:	
Company:		Company:	
Mailing Address:		Mailing Address:	
Daytime Phone #:		Daytime Phone #:	
E-mail Address:		E-mail Address:	

LOCATION OF DEVELOPMENT			
Name of Project:			
Address and Town:			
DEP Permit Number:		Year of Permit:	

PROJECT SPECIFICS	
If the project is unfinished, please describe its current status and your plans for the future. The filing of this report of on-site long-term maintenance activities is still required.	
If the project is within a MPDES Regulated Town, the maintenance report prepared for the town should be submitted with this form.	
If the project is a subdivision with a Homeowner's association, identify the responsible party.	
Confirm that the required recording of deed restrictions for the protection of buffers or conservation land has been done, and that the buffers are maintained according to the restrictions.	
Identify the contractor for the required renewal of a 5-year maintenance contract for the inspection, cleaning and maintenance of manufactured proprietary structures.	
Is a maintenance log available for review?	

LONG-TERM MAINTENANCE (please comment on the following):

All areas of the development have been inspected for erosion, and appropriate steps have been taken to permanently stabilize these areas.

All stormwater control structures have been inspected for damage, wear, malfunction, and appropriate steps have been taken to repair or replace the failing systems.

The erosion control and stormwater maintenance plan for the site is being implemented as written, and a maintenance log has been created and is being maintained.

CERTIFICATIONS/SIGNATURES

By signing below, the owner (or authorized agent) certifies that all stormwater management structures at the project described above are stable and operational as designed.

Signed: _____ Title _____ Date: _____

This completed form and all supporting documents summarized above shall be sent to the following address. An emailed report is appropriate and should be sent to Recert-DEP@maine.gov

Five-year Recertification
Bureau of Land Resources
17 State House Station
Augusta, ME 04333
Tel: (207) 287-2624 or (207) 287-2602

Appendix F
Post Construction – City of Biddeford Annual Stormwater Management Facilities
Certification Forms

ENVIRONMENT

34 Attachment 2

City of Biddeford

Appendix 1

**Annual Stormwater Management Facilities Certification (to be sent to City's
Enforcement Authority)
[Amended 6-20-2023 by Ord. No. 2023.61¹]**

- I, _____ (print or type name), certify the following:
1. I am making this Annual Stormwater Management Facilities Certification for the following property:
_____ (print or type name of subdivision, condominium or other
development) located at _____ (print or type address), (the
"Property");
 2. The owner, operator, tenant, lessee or homeowners' association of the Property is: _____
(name(s) of owner, operator, tenant, lessee, homeowners' association or other party having control
over the Property);
 3. I am (check one)
 - a. _____ the owner, operator, tenant, lessee or president of the homeowners' association and have
hired a Qualified Post Construction Stormwater Inspector; or
 - b. _____ am a Qualified Post-Construction Stormwater Inspector hired by the person identified in
item two of this form;
 4. I have knowledge of erosion and stormwater control and have reviewed the approved Post-
Construction Stormwater Management Plan for the Property;
 5. On _____, 20 _____, I inspected or had inspected by a Qualified Post-Construction
Stormwater Inspector, the Stormwater Management Facilities, including but not limited to parking
areas, catch basins, drainage swales, detention basins and ponds, pipes and related structures required
by the approved Post-Construction Stormwater Management Plan for the Property;
 6. I have attached a copy of the Annual Inspection Report. At the time of the inspection (check one and
complete any required information):
 - a. The Stormwater Management Facilities were adequately maintained and functioning as
intended; or
 - b. The Stormwater Management Facilities required maintenance, which was completed within the
required sixty-day time period, and were functioning as intended after maintenance was
completed; or
 - c. The Stormwater Management Facilities required maintenance which was not completed within
the required sixty-day time period. (Attach additional sheets as necessary to describe the
maintenance required, proposed schedule for completion, and an appropriate contact person.
The City will contact them to confirm or adjust the schedule to complete the maintenance and
any needed further course of action. You will be required to show proof of final maintenance.)

¹ Editor's Note: This ordinance also repealed former Appendix 1, Maintenance Agreement for
Stormwater Management Facilities, and redesignated former Appendix 2 as Appendix 1.

BIDDEFORD CODE

Date: _____, 20.

By: _____

Signature

Print Name

Mail this certification to the City's Enforcement Authority at the following address [to be completed by the municipality]: _____

Appendix G
Maine DEP Stormwater Application Checklist



DEPARTMENT OF ENVIRONMENTAL PROTECTION

STORMWATER APPLICATION CHECKLIST

Applicant: Indian Cliff Development Corp. & Avesta Housing		
Project Name: Barra Road Subdivision		
Town: Biddeford		
Application Type:	☒ Stormwater	☐ Site Law
Watershed Name: Thatcher Brook		
Watershed Type:	☒ UIS	☐ Phosphorus ☐ Neither

Project Area Information

	Existing to Remain ¹	New / Proposed	Total
Impervious (Im)	0	1.52 Acres	1.52Acres
Landscaped (Land)	0	1.90 Acres	1.90 Acres
Developed (Dev) ²	0	3.42 Acres	3.42 Acres

1- If area is not subject to treatment, provide reason and show in a separate column in the Water Quality Calc table.

2- Developed area = Impervious Area + Landscaped Area

A. BASIC STANDARD

1. Erosion and Sedimentation Controls (Appendix A, page 32 of Chapter 500:

<https://www.maine.gov/sos/cec/rules/06/096/096c500.docx>)

- Guidance in Department [ESC BMP Manuals](#)

2. Inspection & Maintenance (Appendix B, page 37 of Chapter 500)

Construction Phase: Show on Plans the following:

- Responsibility for inspection and maintenance
- Construction schedule (how long will it take and in what sequence/critical path to build)
- Inspection frequency
- Scope of inspection
- Inspector qualifications
- Define storm event that triggers a wet weather inspection (0.5" of rain in 24 hours)
- Documentation (3 years minimum)

Post-Construction: Include in written I&M Plan the following:

- Responsibility for inspection and maintenance
- Inspection frequency for each BMP
- Inspection form for each BMP
- Inspector qualifications
- Define storm event that triggers a wet weather inspection (1" of rain in 24 hours)
- Documentation (5 years, minimum)
- Project is subject to Department 5-Year Recertification

3. Good Housekeeping (Appendix C, page 41 of Chapter 500)

- Show all seven elements on Plans.

B. GENERAL STANDARD

Must provide the following on WQ Treatment Plan: All BMPs with subcatchments including time of concentration (Tc) lines, flow lengths and flow types.

1. Soil Explorations (test pit completed by a certified soil scientist) at each proposed BMP

- Include test pit summary table on detail plan.
- If there is potential ledge, address in design.
- If shallow groundwater, address in design.

2. Treatment Standards (modify to fit project): Fill out the following table for the applicable standards that apply.

Applicable Standard	Section in Ch. 500	Required Treatment (Im / Dev)	Area Eligible		Area Treated		Provided Treatment %	
			Im	Dev	Im	Dev	Im	Dev
General Standard	4(C)(2)(a)(i)	95% / 80%	0.85	1.79	0.85	1.47	100.0	82.2
Increased Runoff Treated ¹	4(C)(2)(a)(ii)	90% / 80% min	0	0	0	0	0	0
% Parcel Developed ²	4(C)(2)(a)(iii)	90% / 75% min	0	0	0	0	0	0
Redevelopment ³ (Dev Area)	4(C)(2)(d)	0% min (SW) 50% min (Site)	0	0	0	0	0	0
Linear	4(C)(5)(c)	75% / 50% min	0.66	1.63	0.63	0.93	94.9	57.0
Other: Offsite Treatment/Mitigation			0	0	0	0	0	0
Project Total Area =			1.51	3.42	1.48	2.40	98.0	70.2

1- If proposing to treat more than the first flush, state why meeting Ch. 500, § 4(C)(2)(a)(i) is not practicable.

2- Reduced % based on portion of parcel developed.

3- Include pollutant impact ranking calculations (current and proposed) and a figure showing the Redevelopment window.

3. Proposed BMPs: Please provide the following information on the Table below for EACH BMP.

BMPs Proposed	#	Pretreatment	Sizing calcs	Detail on Plans ¹	CPV Draindown Time	HydroCAD
Soil Filter	3	Yes	Yes	Yes	Yes	Yes

1- BMP details (cross sections, elevation sections, plan view)

Link to Stormwater Design BMP Volumes I, II, III

<https://www.maine.gov/dep/land/stormwater/stormwaterbmps/index.html>

- Provide Construction Oversight Notes.
- If BMP is unlined, review and satisfy (Appendix E Sections 4(b) and 4(c), page 50 of Chapter 500).
- Treatment buffers (Appendix F, page 56 of Chapter 500): must provide sample deed restriction (Appendix G, page 64 of Chapter 500).
- Infiltration must satisfy Appendix D, page 44 of Chapter 500.
- Is conveyance designed to a 10-year, 24-hour storm?
- Is a drainage easement required for any areas to be flooded?
- Discharge to a public storm sewer system: Must provide authorization from the authority.

If proposing Proprietary BMPs, provide:

- Letter from vendor approving sizing and siting
<https://www.maine.gov/dep/land/stormwater/stormwaterbmps/index.html>.
- Executed 5-Year I&M Agreement with a provider approved by vendor.
- Narrative section and specific inspection forms in the written I&M Plan.
- Pervious pavement: Must provide Executed 5-Year I&M Agreement and vacuum equipment used.

C. PHOSPHORUS STANDARD

MUST provide on the WQ Treatment Plan: BMPs with subcatchments including time of concentration (Tc) lines, flow lengths and flow types;

Provide export calculations clearly showing distinct BMPs: Phosphorus Table Calculations

[Worksheet 4 july 2015.xlsx](#).

D. FLOODING STANDARD

1. Add pre- and post- peak flow rates table to post development plan for storms (2-, 10-, 25-year).
2. Is primary access road passable up to a 25-year, 24-hour storm?
3. If requesting a waiver of the Flooding Standard, must state justification for the waiver.
4. HydroCad or other runoff model
 - If post peak flow rate is > pre-peak flow, a waiver request will be needed with justification Ch. 500, § 4(F)(3)(a) or (b),
 - If discharging to wetland see Chap. 500, § 4(I).

This checklist has been designed by DEP stormwater engineers as a guidance tool to assist applicants and their consultants when preparing stormwater applications. Completing the checklist is recommended and valuable, but it is not a substitute for reviewing Ch. 500, and completing all the items on the checklist does not automatically mean all the Ch. 500 requirements have been satisfied. The contents of Ch. 500 should be reviewed carefully for the applicable requirements that apply to your proposed project.

I have reviewed this checklist and included in my submission all the required elements of this checklist that apply to the proposed project.

Maine Engineer of Record:



Signature

July 12, 2024

Date

Christopher R. MacDonald P.E. Maine # 11985

Name (print)

AVESTA HOUSING PROJECT

BARRA ROAD
BIDDEFORD, MAINE

FOR



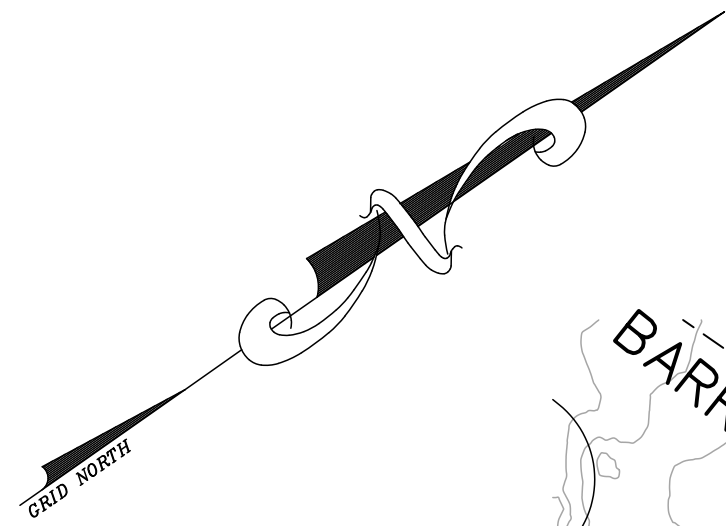
PLAN INDEX

1	SITE PLAN
2	EXISTING CONDITIONS PLAN
3	GRADING PLAN
4	DETAILS A
5	DETAILS B
6	GRASSED UNDERDRAIN SOIL FILTER 1 DETAILS
7	EROSION CONTROL DETAILS
A	PRE DEVELOPMENT PLAN
B	POST DEVELOPMENT PLAN
L-1	LANDSCAPING PLANS (BY RASOR LANDSCAPE ARCHITECTURE)
M	PHOTOMETRIC PLANS (BY CHARRON REFLEX LIGHTING)
SD	ARCHITECTURE PLANS (BY LASSEL ARCHITECTS)



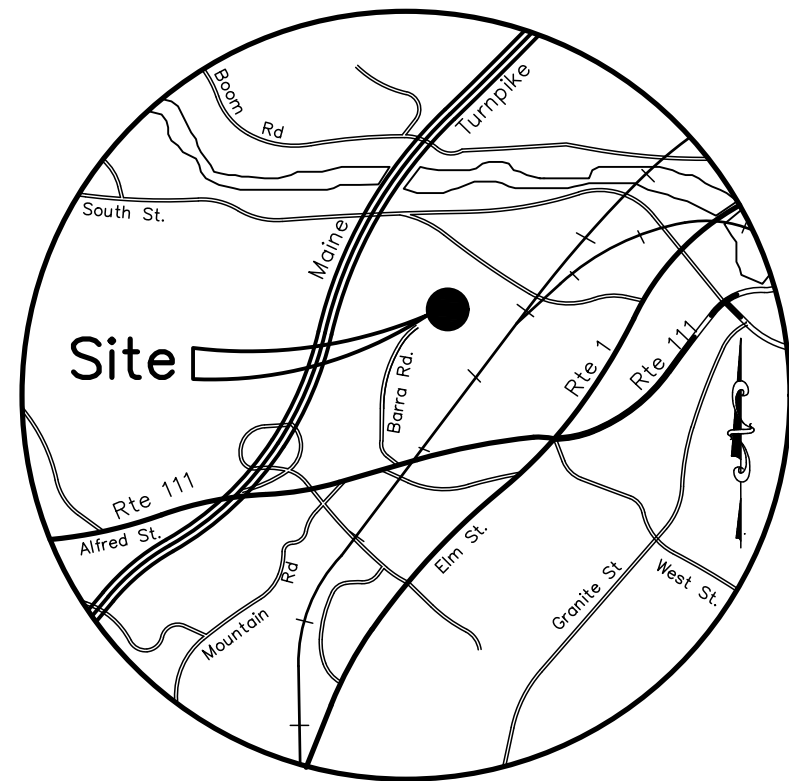
Berry, Huff, McDonald, Milligan Inc.
Engineers, Surveyors

380B Main Street Tel. (207) 839-2771
Gorham, Maine 04038 Fax (207) 839-8250



N/F
MAINE BEHAVIORAL
HEALTHCARE
MAP 2 LOT 42-10

THATCHER
BROOK



LOCATION MAP
SCALE: 1" = 2 MILES

LIMITS OF ASSUMED
TOPOGRAPHY BASED ON
60 BARRA ROAD,
CURRENTLY UNDER
CONSTRUCTION SEE NOTE 12

LIMITS OF ASSUMED
TOPOGRAPHY BASED ON
60 BARRA ROAD,
CURRENTLY UNDER
CONSTRUCTION SEE NOTE 12

N/F
60 BARRA ROAD LLC
MAP 2 LOT 43-1
(UNDER CONSTRUCTION)

LAND OF
INDIAN CLIFF DEVELOPMENT
CORP
MAP 7 LOT 15
2,438,387 S.F. +/-
55.98 ACRES +/-

BENCHMARK
8" SPIKE
N: 238,504.18'
E: 2,868,181.73'
ELEV. 117.29'

BENCHMARK
8" SPIKE
N: 238,528.15'
E: 2,868,192.99'
ELEV. 121.75'

BENCHMARK
8" SPIKE
N: 238,542.09'
E: 2,868,370.03'
ELEV. 116.63'

Lyc (D)

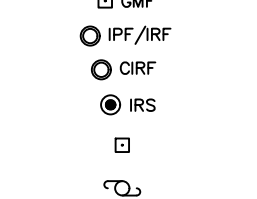
Wetlands (Typ.)

BENCHMARK
8" SPIKE
N: 237,904.03'
E: 2,868,320.91'
ELEV. 111.17'

N/F
SAWMILL PARK
PROPERTIES
MAP 7 LOT 17-4

N/F
INDIAN CLIFF
DEVELOPMENT CORP
MAP 7 LOT 17-2

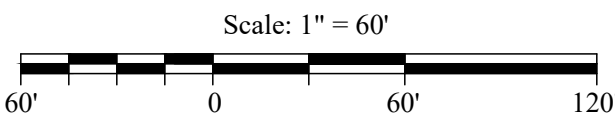
SYMBOL



LEGEND

DESCRIPTION

GRANITE MONUMENT FOUND
IRON PIPE/IRON ROD FOUND
CAPPED IRON ROD FOUND
5/8" IRON ROD W/ CAP TO BE SET
GRANITE MONUMENT TO BE SET
UTILITY POLE
PROPERTY LINE
ABUTTER PROPERTY LINE
WETLANDS
WATER MAIN
FORCEMAIN
GAS MAIN
OVERHEAD UTILITIES



NOTES:

- OWNER: INDIAN CLIFF DEVELOPMENT CORP.
260 MAIN STREET
P.O. BOX 444
BIDDEFORD, MAINE
- APPLICANT: AVESTA HOUSING
307 CUMBERLAND AVENUE
PORTLAND, MAINE
- SURVEYOR: ROBERT C. LIBBY JR. PLS #2190
BH2M
380B MAIN STREET
GORHAM, MAINE
- WETLANDS: MARK HAMPTON ASSOCIATES
PORTLAND, MAINE
- DEED REFERENCE: BOOK 5486, PAGE 6
- TAX MAP REFERENCE: MAP 7, LOT 15
- TOTAL PARCEL AREA: +/- 56 ACRES
- THE SURVEYED PARCEL IS LOCATED WITHIN ZONE A (AREAS OF 100 YEAR FLOODING) AS SHOWN ON THE FLOOD INSURANCE RATE MAP FOR THE CITY OF BIDDEFORD, MAINE, COMMUNITY PANEL NO. 230145 0003B, DATED MAY 15, 1984.
- HORIZONTAL DATUM: NAD 83 MAINE WEST
- VERTICAL DATUM: NAVD 88
- BENCHMARK: MULTIPLE AS NOTED ON THESE PLANS
- EXISTING TOPOGRAPHY BASED ON GROUND TOPOGRAPHY BY BH2M PERFORMED WINTER OF 2024. LIDAR DERIVED FROM NOAA DIGITAL COAST DATA 2020 USGS LIDAR: SOUTH COASTAL MAINE (QL2), AND ASSUMED CONDITIONS BASED ON GRADING CURRENTLY UNDER CONSTRUCTION BY 60 BARRA ROAD TO BE COMPLETED SUMMER OF 2024. SEE BOUNDARIES AS NOTED.
- EXISTING PUBLIC AND PRIVATE UTILITY AND UNDERGROUND LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE, AND ALL UTILITIES AND PIPES ARE NOT NECESSARILY SHOWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING IN FIELD THE LOCATIONS OF UTILITIES SHOWN, AND FOR INVESTIGATING AND IDENTIFYING THE EXISTENCE AND LOCATIONS OF ANY ADDITIONAL PUBLIC AND PRIVATE UTILITIES NOT SHOWN ON THE PLANS, BEFORE COMMENCING ANY EXCAVATIONS, AND SHALL BE RESPONSIBLE FOR REPAIRING ALL UTILITIES AND PIPES, BOTH PUBLIC AND PRIVATE, WHETHER SHOWN ON PLANS OR NOT, THAT ARE DISTURBED DURING CONSTRUCTION. ALL COSTS INCURRED IN INVESTIGATING AND REPAIRING SAID UTILITIES SHALL BE BORNE BY THE CONTRACTOR, AND SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE WORK PAID FOR UNDER THE APPLICABLE LUMP SUM AND UNIT PRICES IN THE CONTRACT. UTILITIES INCLUDE BUT ARE NOT LIMITED TO ELECTRIC, TELEPHONE, NATURAL GAS, WATER, SEWER AND STORM DRAINAGE. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING DIG SAFE.
- PLAN REFERENCES:
 - STANDARD BOUNDARY SURVEY PLAN BARRA ROAD SUBDIVISION BY BH2M DATED MAY 2024, INCLUDED IN PRELIMINARY SUBMISSION TO THE PLANNING BOARD FOR THE BARRA ROAD SUBDIVISION, BEING FILED IN PARALLEL.
 - BARRA ROAD APARTMENTS, A 250 UNIT APARTMENT PROJECT, 60 BARRA ROAD, BIDDEFORD MAINE, ISSUED FOR CONSTRUCTION PLANSET BY BH2M.

SOILS LEGEND

SYMBOL DESCRIPTION
SOIL BOUNDARY LINES

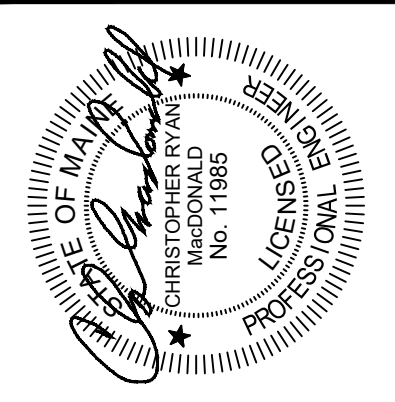
SOIL DESIGNATION

SLOPE DESIGNATION
A/B(A)
HYDROLOGIC SOIL GROUP
HYDROLOGIC SOIL

HYDROLOGIC SOIL GROUP

SOIL GROUP
BUXTON (BuC)
LYMAN-ROCK (LyB)
LYMAN-ROCK (Lyc)
SCANTIC (Sc)

NO.	DATE	REVISION	DESCRIPTION
1	5/15/24		Submitted for Preliminary Permit Application
2	7/17/24		Submitted for Final Permit Application



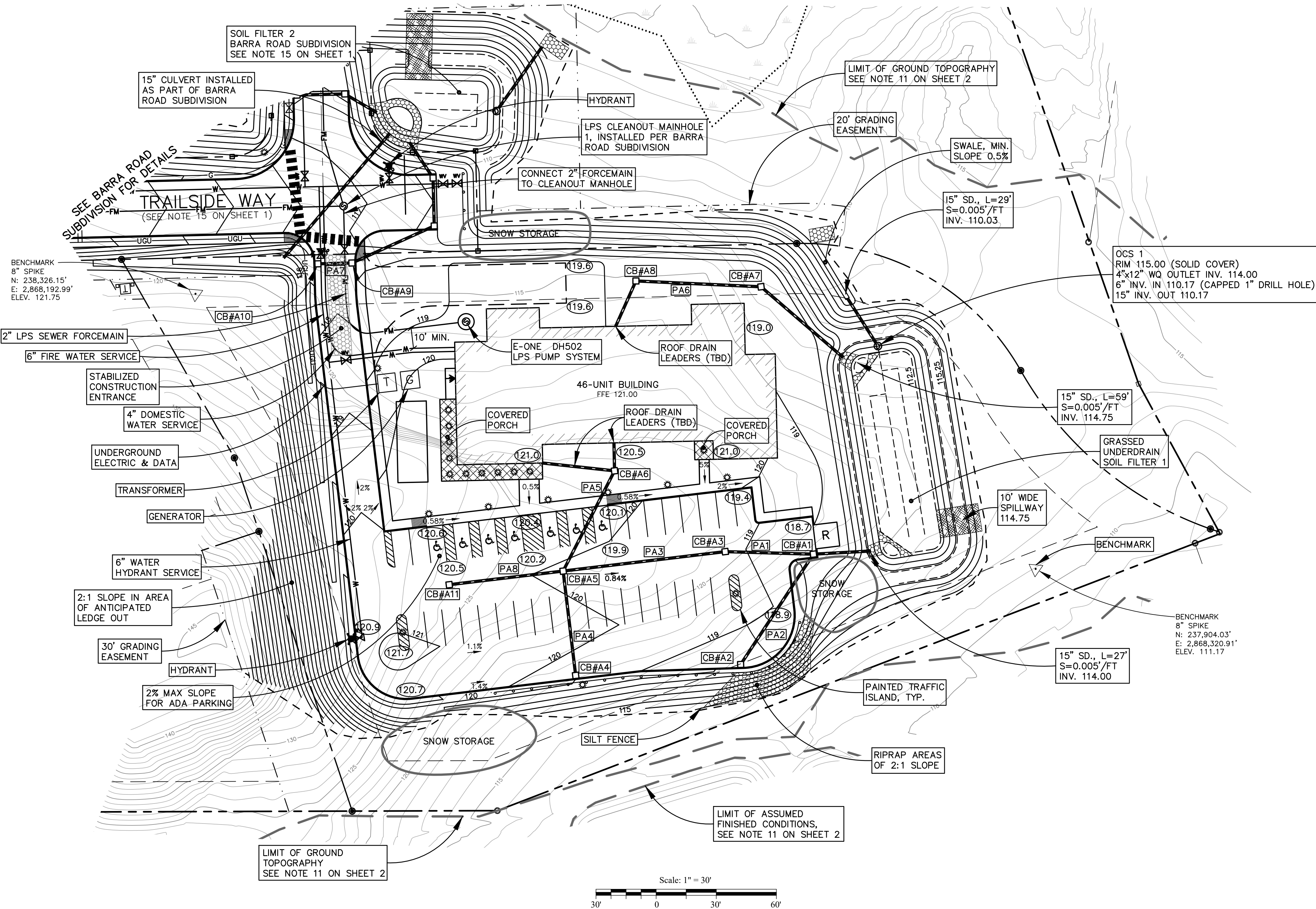
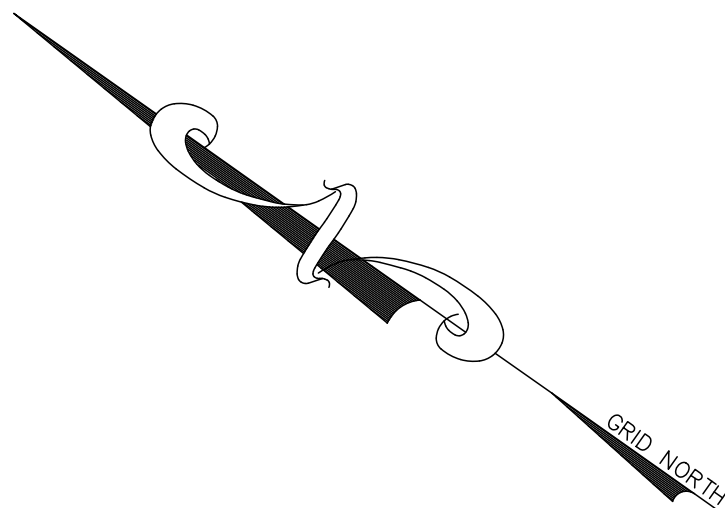
BH2M
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Engineers, Surveyors
380B Main Street
Gorham, Maine 04038
Tel: (207) 839-2771
www.bh2m.com

FOR
Avesta Housing
307 Cumberland Avenue
Portland, Maine

EXISTING CONDITIONS
PLAN
AVESTA HOUSING PROJECT
BARRA ROAD
BIDDEFORD, MAINE

DESIGNED C. MacDonald	DATE May 2024
DRAWN Dept.	SCALE 1" = 60'
CHECKED C. MacDonald	JOB. NO. 24017

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2
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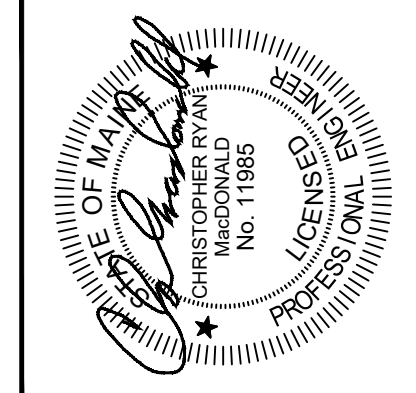
SYMBOL	DESCRIPTION
	GRANITE MONUMENT FOUND
	IRON PIPE/IRON ROD FOUND
	CAPPED IRON ROD FOUND
	5/8" IRON ROD W/ CAP TO BE SET
	GRANITE MONUMENT TO BE SET
	UTILITY POLE
	PROPERTY LINE
	BUILDING SETBACK
	ABUTTER PROPERTY LINE
	WETLANDS
	WATER MAIN
	FORCEMAIN
	GAS MAIN
	UNDERGROUND UTILITIES
	GUARDRAIL

STORMDRAIN PIPES	
PA1 - 15" S.D., L=41', S=0.010'/FT.	
PA2 - 15" S.D., L=60', S=0.005'/FT.	
PA3 - 15" S.D., L=77', S=0.010'/FT.	
PA4 - 15" S.D., L=49', S=0.005'/FT.	
PA5 - 15" S.D., L=52', S=0.005'/FT.	
PA6 - 15" S.D., L=59', S=0.005'/FT.	
PA7 - 15" S.D., L=16', S=0.005'/FT.	
PA8 - 15" S.D., L=53', S=0.016'/FT.	

STORMDRAIN/SEWER STRUCTURES	
CB#A1	RIM 118.3 15" INV. IN 114.75 (W) 15" INV. IN 114.14 (SW) 15" INV. OUT 114.13 (SE)
CB#A2	RIM 118.4 15" INV. OUT 114.44 (E)
CB#A3	RIM 119.2 15" INV. IN 115.26 (NW) 15" INV. OUT 115.16 (SE)
CB#A4	RIM 119.5 15" INV. OUT 114.74 (NE)
CB#A5	RIM 119.8 15" INV. IN 114.25 (NW) 15" INV. IN 114.25 (E) 15" INV. IN 114.25 (SW) 15" INV. OUT 114.15 (SE)
CB#A6	RIM 120.0 8" INV. IN 115.09 (ROOF DRAIN-SW) 8" INV. IN 115.09 (ROOF DRAIN-NE) 15" INV. OUT 114.51 (W)
CB#A7	RIM 118.5 15" INV. IN 115.05 (NW) 15" INV. OUT 115.05 (S)
CB#A8	RIM 118.5 8" INV. IN 115.09 (ROOF DRAIN-W) 15" INV. OUT 115.35 (SE)
CB#A9	RIM 117.3 15" INV. IN 112.95 (NW) 15" INV. OUT 112.85 (E)
CB#A10	RIM 117.3 15" INV. OUT 113.11 (SE)
CB#A11	RIM 120.35 15" INV. IN 117.00 (SE)

- NOTES:
- STOCKPILE AREAS TO BE IDENTIFIED PRIOR BY CONTRACTOR PRIOR TO CONSTRUCTION ALONG WITH EROSION AND SEDIMENTATION CONTROLS.
 - CONTRACTOR TO IMPLEMENT DUST CONTROL MEASUREMENTS THROUGHOUT CONSTRUCTION.
 - PAVE UTILITY TRENCHES WITHIN THE CITY R.O.W. WITHIN 3 DAYS OF EXCAVATION OR PRIOR TO THE NEXT RAIN EVENT.
 - PROPOSED DISTURBANCE OF 77,579 SF.

NO.	DATE	REVISION	DESCRIPTION
1	5/15/24		Submitted for Preliminary Permit Application
2	7/17/24		Submitted for Final Permit Application



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FOR

Avesta Housing
307 Cumberland Avenue
Portland, Maine

GRADING PLAN

AVESTA HOUSING PROJECT

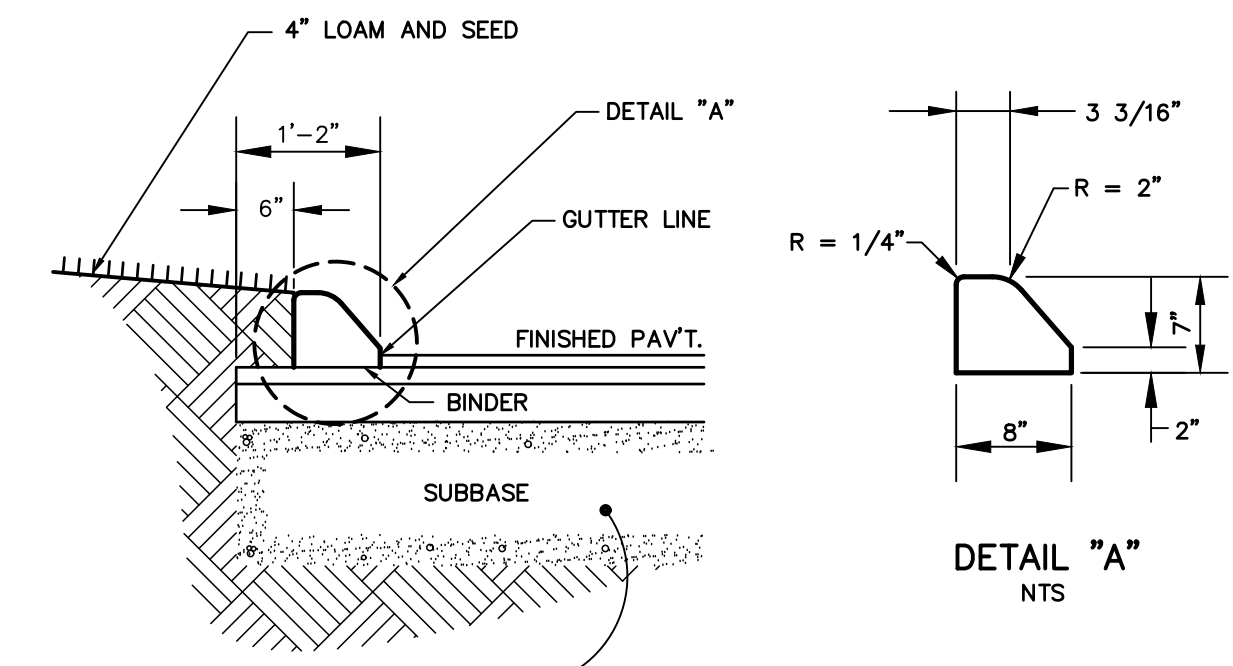
BARRA ROAD
BIDDEFORD, MAINE

DESIGNED C. MacDonald	DATE April 2024
DRAWN Dept.	SCALE 1" = 30'
CHECKED C. MacDonald	JOB. NO. 24017

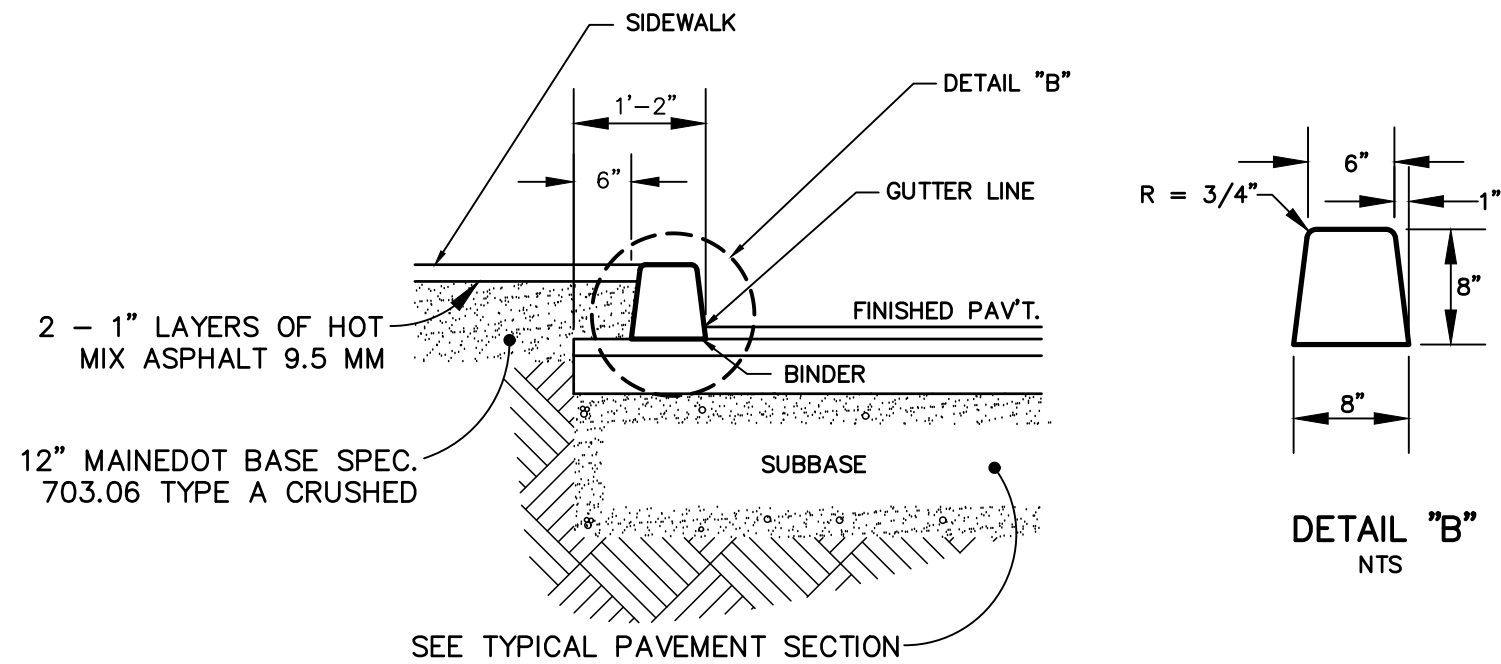
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SLOPED CURB
NTS

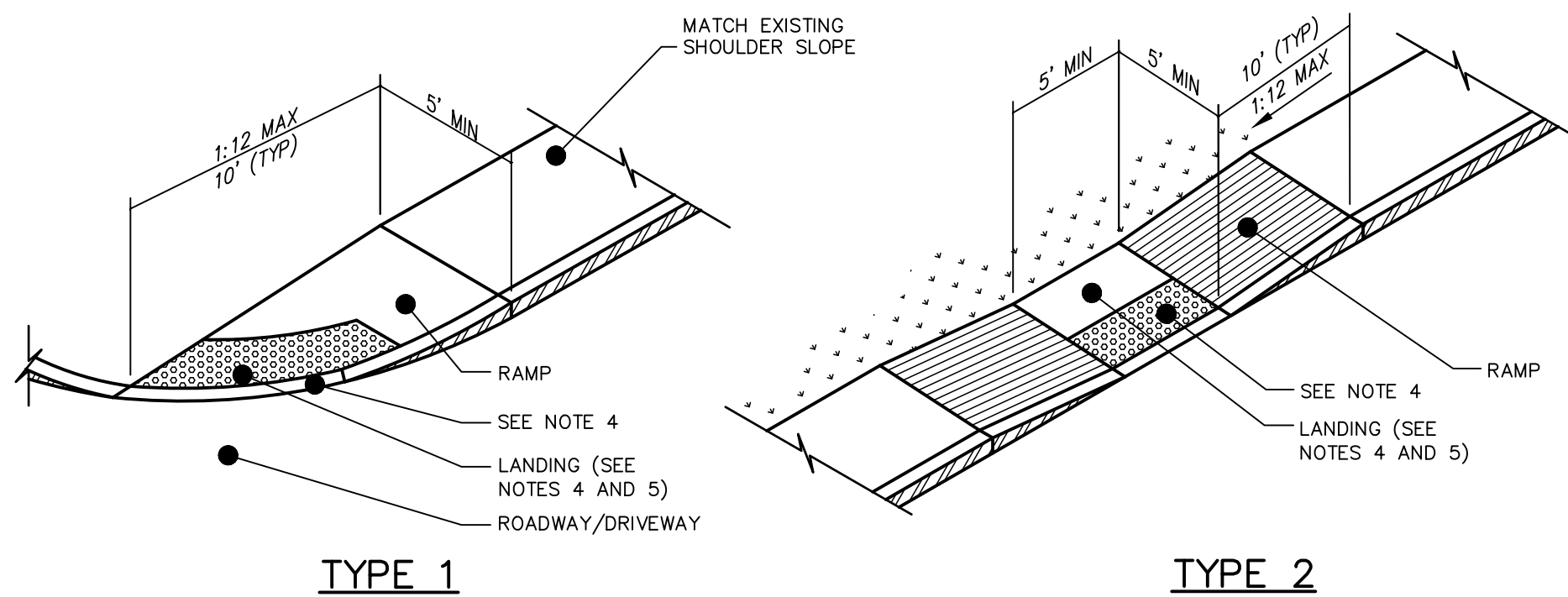


VERTICAL CURB
NTS

NOTES:

- 1 LB. FIBER MESH SHALL BE ADDED TO EVERY CUBIC YARD OF CONCRETE. THE CONCRETE WILL CONTAIN THE MAXIMUM AMOUNT OF WATER TO BE OF A CONSISTENCY THAT THE CONCRETE WILL MAINTAIN THE SHAPE OF THE CURB SECTION WITHOUT SUPPORT. THIS MIX ALSO MEETS THE READY MIX REQUIREMENTS OF ASTM C94 AND WILL MEET OR EXCEED 4,000 PSI IN 28 DAYS.
- THE PAVEMENT SHALL BE THOROUGHLY CLEANED TO REMOVE DUST, DIRT AND OIL BEFORE APPROVED ADHESIVE IS APPLIED PER MANUFACTURERS SPECIFICATIONS.
- THE FIBER REINFORCED MIX SHALL BE FED INTO THE VIBRATING HOPPER WHERE IT IS COMPACTED INTO THE DESIRED MOLD PROFILE.
- FRESHLY EXTRUDED CURB SHALL BE LIGHTLY TOUCHED UP WITH A STEEL HAND TROWEL. CONTROL JOINTS SHALL BE TOOLED AS SOON AS POSSIBLE AT 9' INTERVALS. ADDITIONAL CONTROL JOINTS ADDED ON RADIUS AS NECESSARY.
- THE FINISHED CURB WILL BE COATED WITH AN APPROVED CURING COMPOUND.
- FOLLOW MANUFACTURERS INSTALLATION INSTRUCTIONS AND TEMPERATURE RESTRICTIONS.
- USE VERTICAL CURB FOR ALL AREAS ADJACENT TO SIDEWALK. USE SLOPED CURB IN ALL OTHER AREAS.

EXTRUDED CONCRETE CURB
NTS



ADA RAMPS
N.T.S.

NOTE:

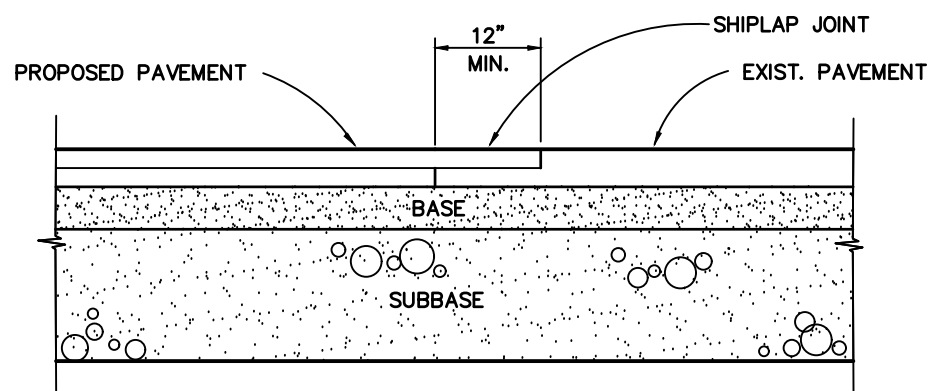
- CURB RAMP LENGTHS ARE BASED ON SIX (6) INCH CURB REVEAL HEIGHT AND NO RUNNING SLOPE. RAMP LENGTHS SHALL BE ADJUSTED AS NECESSARY TO ACCOMMODATE VARYING CURB REVEAL HEIGHTS AND TO MATCH RUNNING SLOPES OF ADJACENT ROADWAY AND SIDEWALK SLOPES TO MAINTAIN A RAMP THAT DOES NOT EXCEED THE MAXIMUM RAMP SLOPE OF 1:12.
- DETECTABLE WARNINGS SHALL CONSIST OF RAISED TRUNCATED DOMES AND SHALL HAVE A BASE DIAMETER OF 0.9 INCHES (23 mm) MINIMUM AND 1.4 INCHES (36 mm) MAXIMUM; A TOP DIAMETER OF 50 PERCENT OF THE BASE DIAMETER MINIMUM TO 65 PERCENT OF THE BASE DIAMETER MAXIMUM AND A HEIGHT OF 0.2 INCHES (5.1 mm), A CENTER-TO-CENTER SPACING OF 1.6 INCHES (41mm) MINIMUM AND 2.4 INCHES (61mm) MAXIMUM; AND A BASE-TO-BASE SPACING OF 0.65 INCHES (17mm) MINIMUM, MEASURED BETWEEN THE MOST ADJACENT DOMES ON A SQUARE GRID.
- DETECTABLE WARNINGS SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE. DETECTABLE WARNINGS USED ON INTERIOR SURFACES IN RESILIENCY OR SOUND-ON-CANE CONTACT.
- ALL ACCESSIBLE ROUTE SIDEWALKS INTERSECTING ROADWAYS, DRIVEWAYS, OR OTHER VEHICULAR CROSSINGS REQUIRE DETECTABLE WARNINGS. DETECTABLE WARNING ZONES SHALL BE INSTALLED SIX (6) INCHES (OR THE HORIZONTAL THICKNESS OF THE ADJACENT CURB)) FROM THE FLOW LINE OF THE CURB, EXTEND INTO THE SIDEWALK FOR A 24" DEPTH, AND COVER THE COMPLETE WIDTH OF THE SIDEWALK OR RAMP AREA. DETECTABLE WARNING ZONES SHALL CONFORM TO THE SLOPE REQUIREMENTS OF THE RAMP, LANDING, OR ACCESSIBLE ROUTE AS DEFINED IN THE SPECIFIED DETAIL. DETECTABLE WARNINGS SHALL NOT BE INSTALLED IN FLARED SIDES, IF THE RAMP INCLUDES FLARED SIDES.
- ALL LANDING AREAS SHALL BE 4 FEET WIDE BY 4 FEET LONG (MINIMUM DIMENSIONS). THE SLOPE OF THE LANDING AREA SHALL NOT EXCEED A 1:48 IN ANY DIRECTION.
- ALL ACCESSIBLE ROUTE SLOPES ADJOINING THE LANDING AREA, EXCLUDING THE CURB RAMP, SHALL NOT EXCEED A SLOPE OF 1:20 UNLESS OTHERWISE NOTED.

4" AGGREGATE BASE SPEC. 703.06 TYPE A CRUSHED
18" AGGREGATE SUBBASE SPEC. 703.06 TYPE D, SEE NOTE 4

NOTES:

- ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO MDOT STANDARDS SPECIFICATIONS, REVISED MARCH 2020, AND MOST RECENT SUPPLEMENTAL SPECIFICATIONS.
- SEE MDOT 401 FOR MATERIALS AND MDOT 413 FOR INSTALLATION.
- ALL MATERIALS SHALL BE COMPACTED TO ACHIEVE 95% OF MAXIMUM DENSITY.
- AGGREGATE SUBBASE SHALL MEET THE REQUIREMENTS OF MAINE DOT SPECIFICATION 703.06 TYPE D, WITH THE EXCEPTION THAT THE AGGREGATE SUBBASE SHALL NOT CONTAIN PARTICLES OF ROCK THAT WILL NOT PASS THE 4 INCH SQUARE MESH SIEVE.

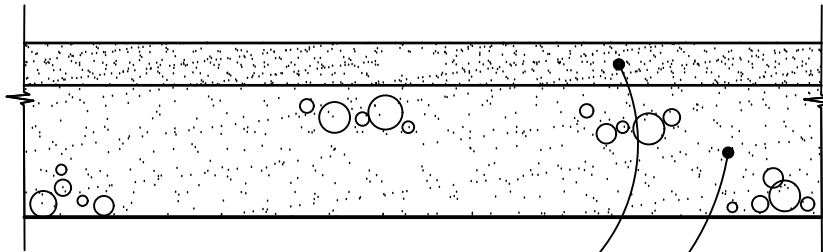
TYPICAL PAVEMENT SECTION
N.T.S.



PAVEMENT JOINT DETAIL
N.T.S.

SAWCUT EXIST. PAVEMENT ALONG A SMOOTH LINE TO A NEAT EVEN VERTICAL JOINT, APPLY TACK PRIOR TO PROPOSED PAVING (AS REQ'D)

3 1/4" HOT BITUMINOUS PAVEMENT
BASE - 2" HOT MIX ASPHALT 19.0 MM
SURFACE - 1 1/4" HOT MIX ASPHALT 9.5 MM

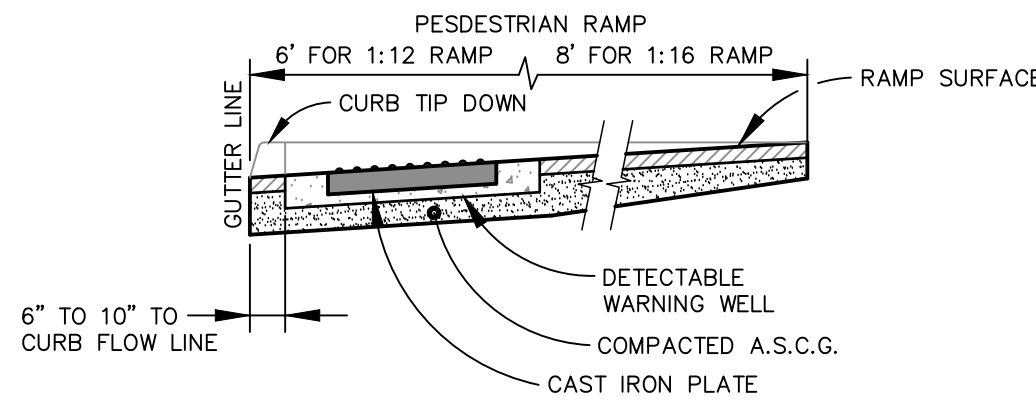


4" AGGREGATE BASE SPEC. 703.06 TYPE A CRUSHED
18" AGGREGATE SUBBASE SPEC. 703.06 TYPE D, SEE NOTE 4

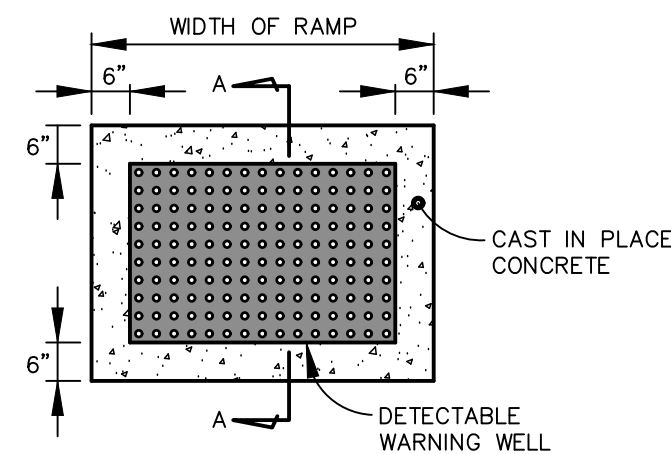
NOTES:

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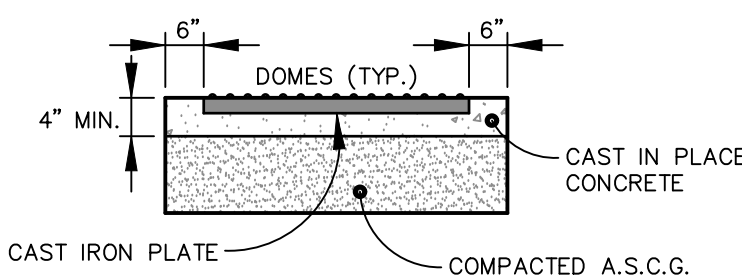
TYPICAL FIRELANE SECTION
N.T.S.



SIDE SECTION OF DETECTABLE WARNING, WELL, CURB AND GUTTER



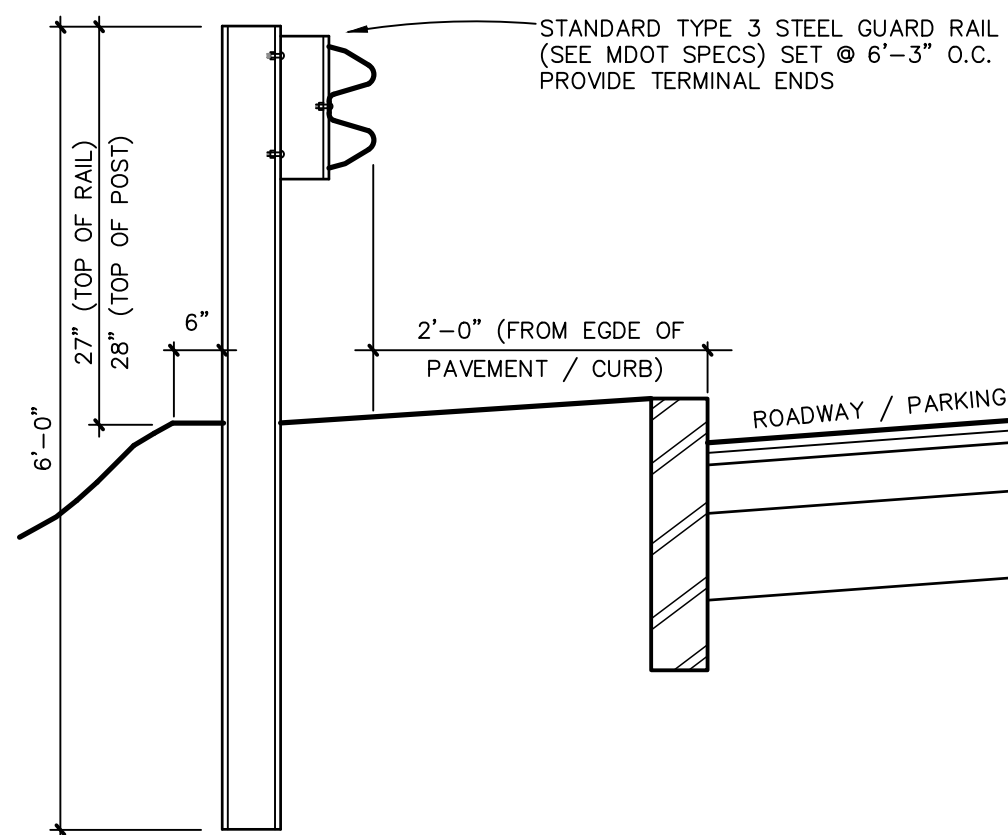
PLAN VIEW OF DETECTABLE WARNING WELL



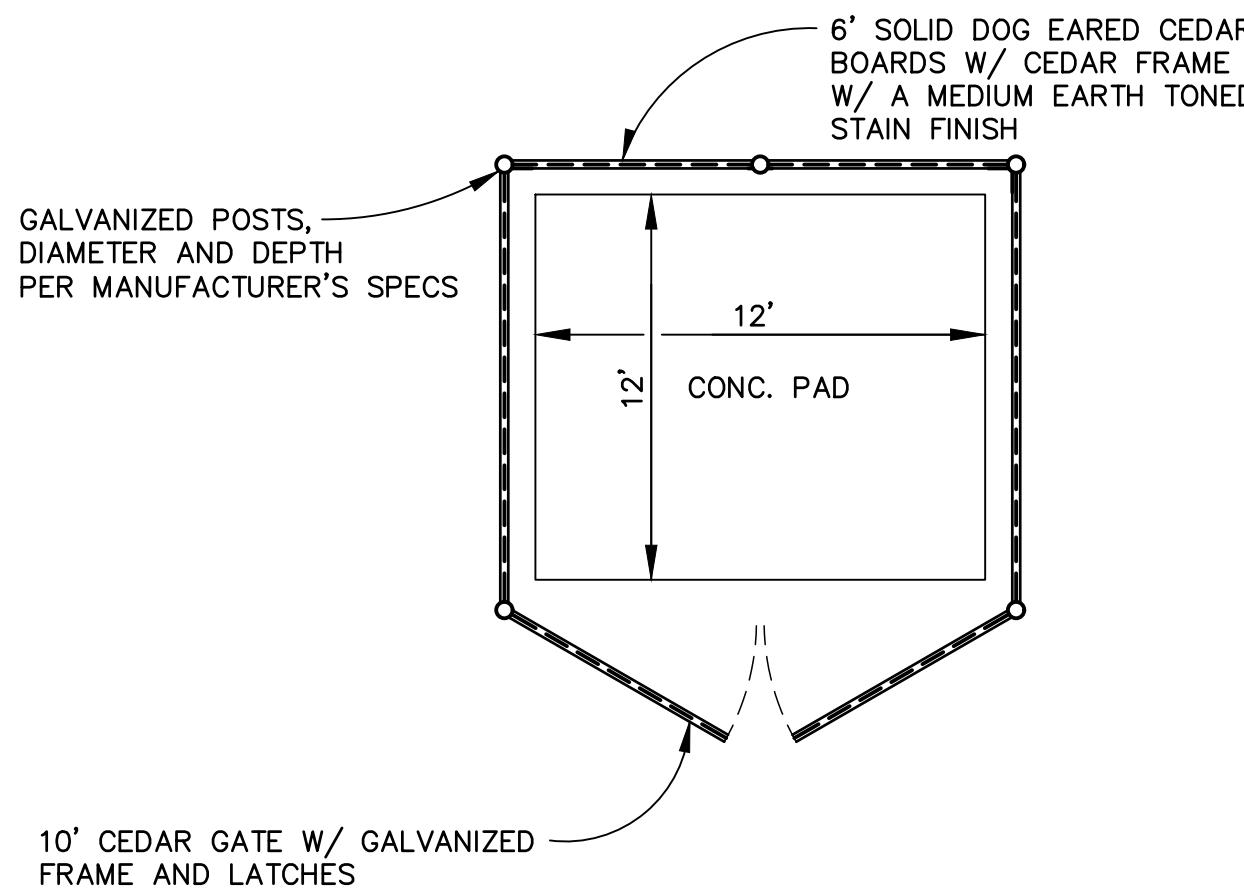
SECTION A-A

NOTE: ALL DETECTABLE WARNING AREAS SHALL START 6-10" FROM THE FLOW LINE OF THE CURB, BE 24" IN DEPTH AND COVER THE COMPLETE WIDTH OF THE RAMP AREA ONLY.

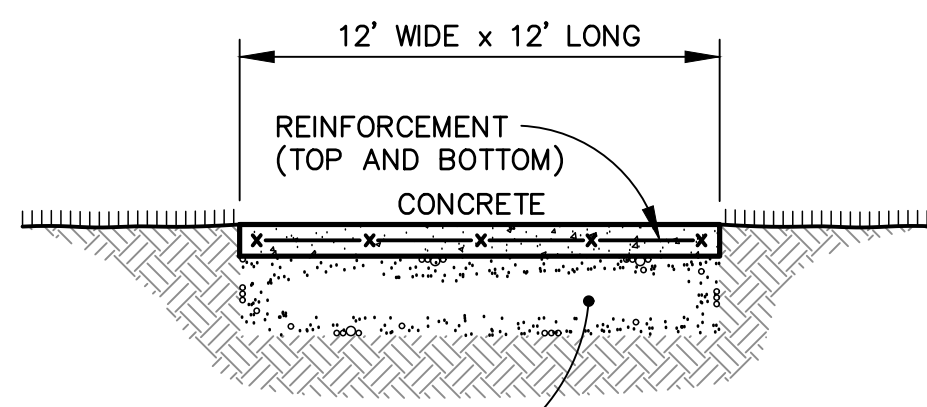
DETECTABLE WARNING MAT EMBEDDING
NTS



STEEL GUARD RAIL
N.T.S.



DUMPSTER ENCLOSURE
NTS

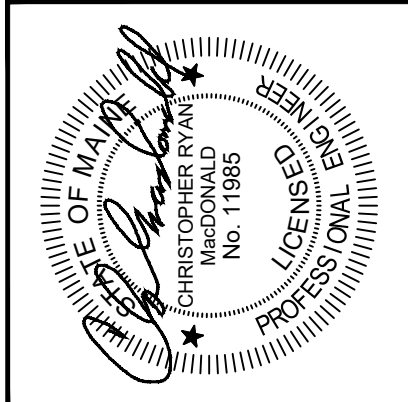


12" CRUSHED AGG. BASE SPEC. 703.06 TYPE A

- CONCRETE - 8" THICK, 4,000 PSI @ 28 DAYS, 3/4" MAX. AGGREGATE, 5-5% AIR ENTRAINMENT, 4" MAX. SLUMP
- REINFORCEMENT FINISH - #4 BARS AT 12" O.C. EACH WAY, TOP AND BOTTOM
- SCREED AND BULL FLOAT, BROOM FINISH PERPENDICULAR TO TRAVEL DIRECTION
- JOINTS SEALING - SAWCUT TO 1/3 DEPTH AT 5'-6' O.C. - APPLY POLY SULFIDE LIQUID SEALANT, GRAY PER MANUFACTURER'S SPEC'S.

DUMPSTER PAD
NTS

REVISION		DESCRIPTION
NO.	DATE	
1	5/15/24	Submitted for Preliminary Permit Application
2	7/17/24	Submitted for Final Permit Application



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FOR

Avesta Housing
307 Cumberland Avenue
Portland, Maine

DETAILS A

AVESTA HOUSING PROJECT

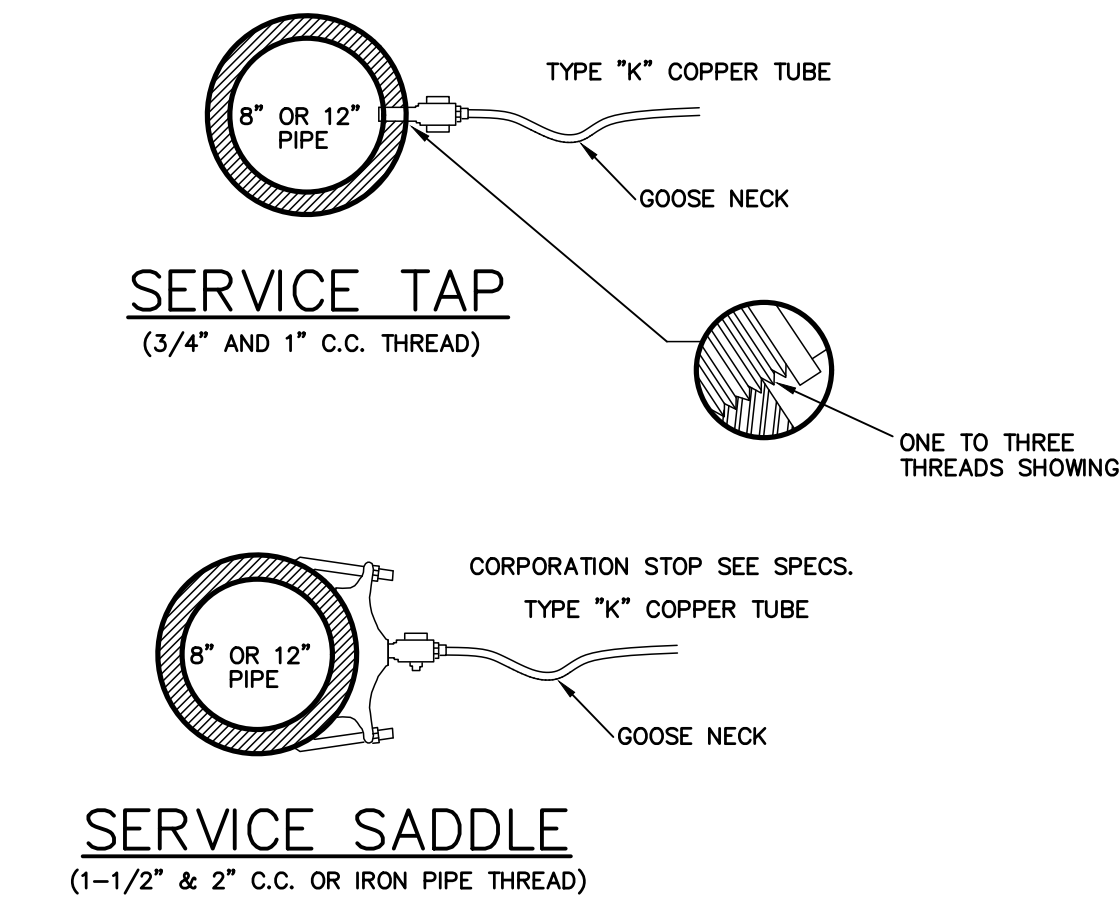
BARRA ROAD
BIDDEFORD, MAINE

DESIGNED C. MacDonald	DATE May 2024
DRAWN Dept.	SCALE As Noted
CHECKED C. MacDonald	JOB. NO. 24017

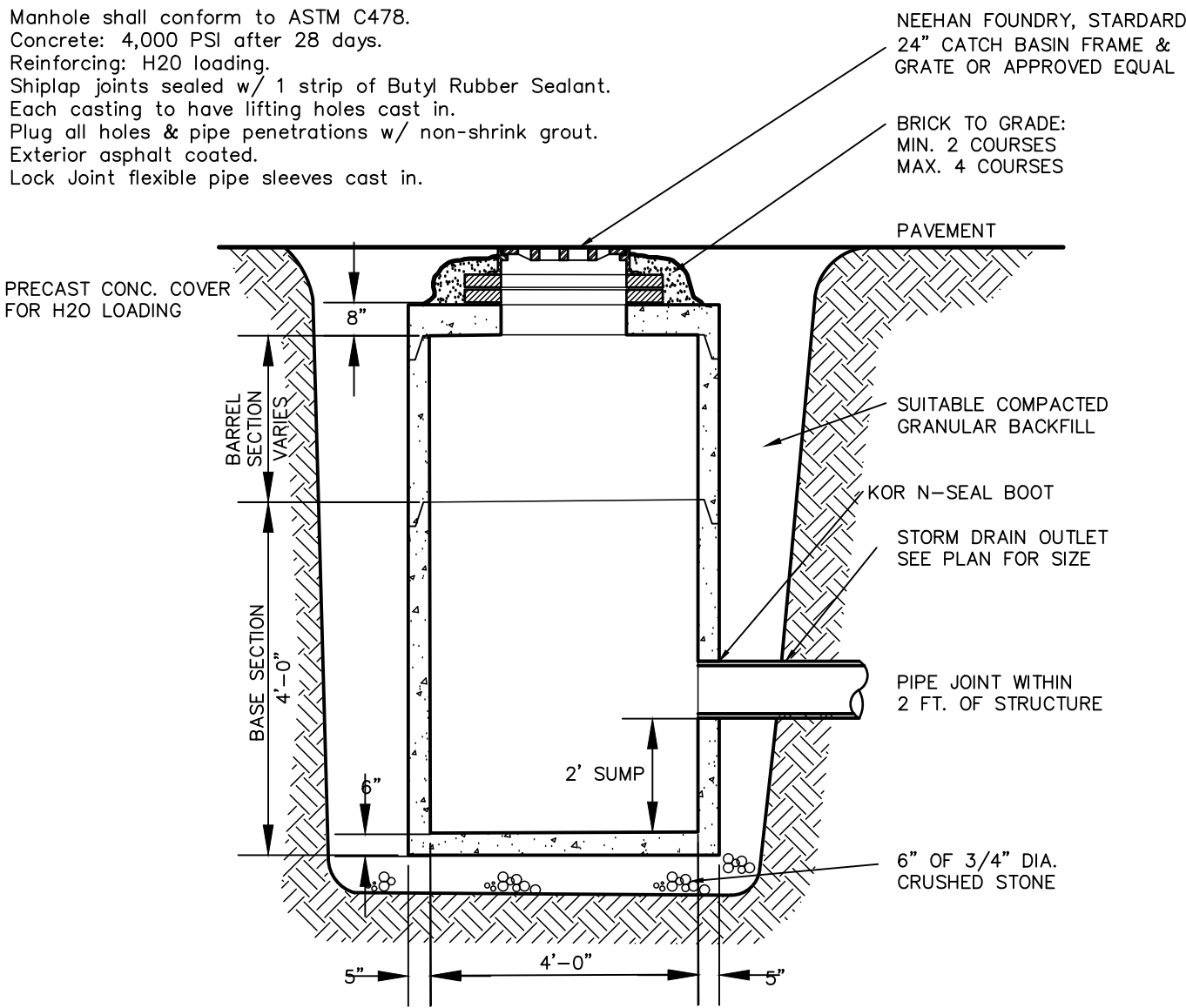
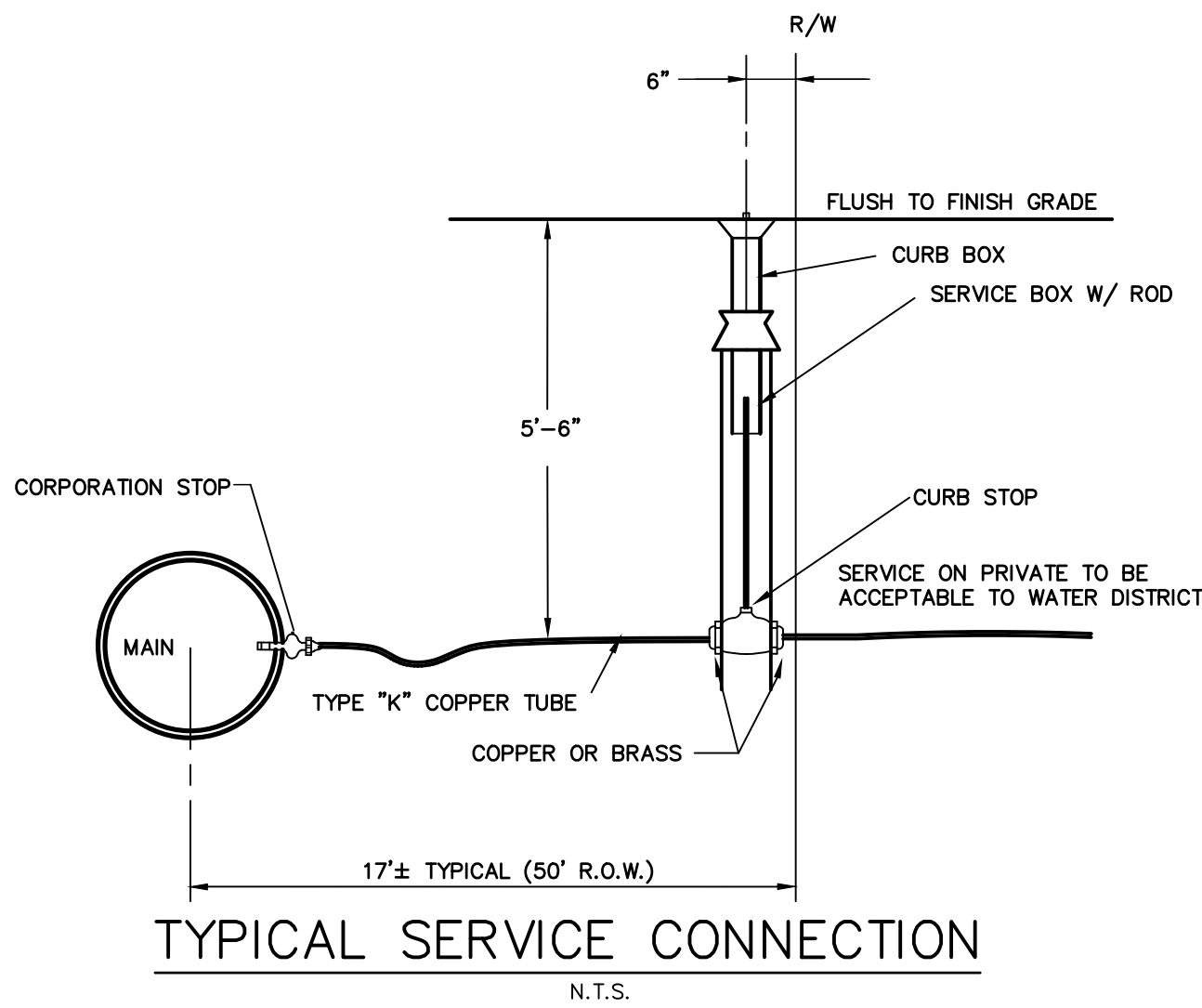
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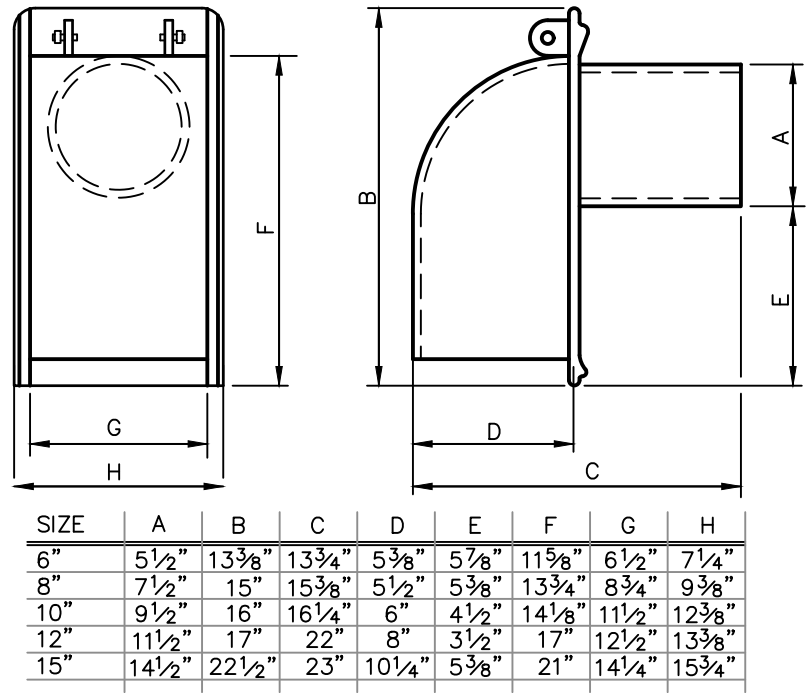
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NOTE: SERVICE CONNECTIONS (DIRECT TAPS AND SERVICE CLAMPS) WILL BE INSTALLED SO THAT THE OUTLET IS AT AN ANGLE OF NOT MORE THAN 45° ABOVE THE HORIZONTAL. ALWAYS PUT A BEND OR "GOOSENECK" IN THE SERVICE LINE PRIOR TO CONNECTING TO PROVIDE FLEXIBILITY AND "GIVE" TO COUNTERACT THE EFFECTS OF A LOAD DUE TO SETTLEMENT OR EXPANSION AND/OR CONTRACTION (SEE DETAILS).

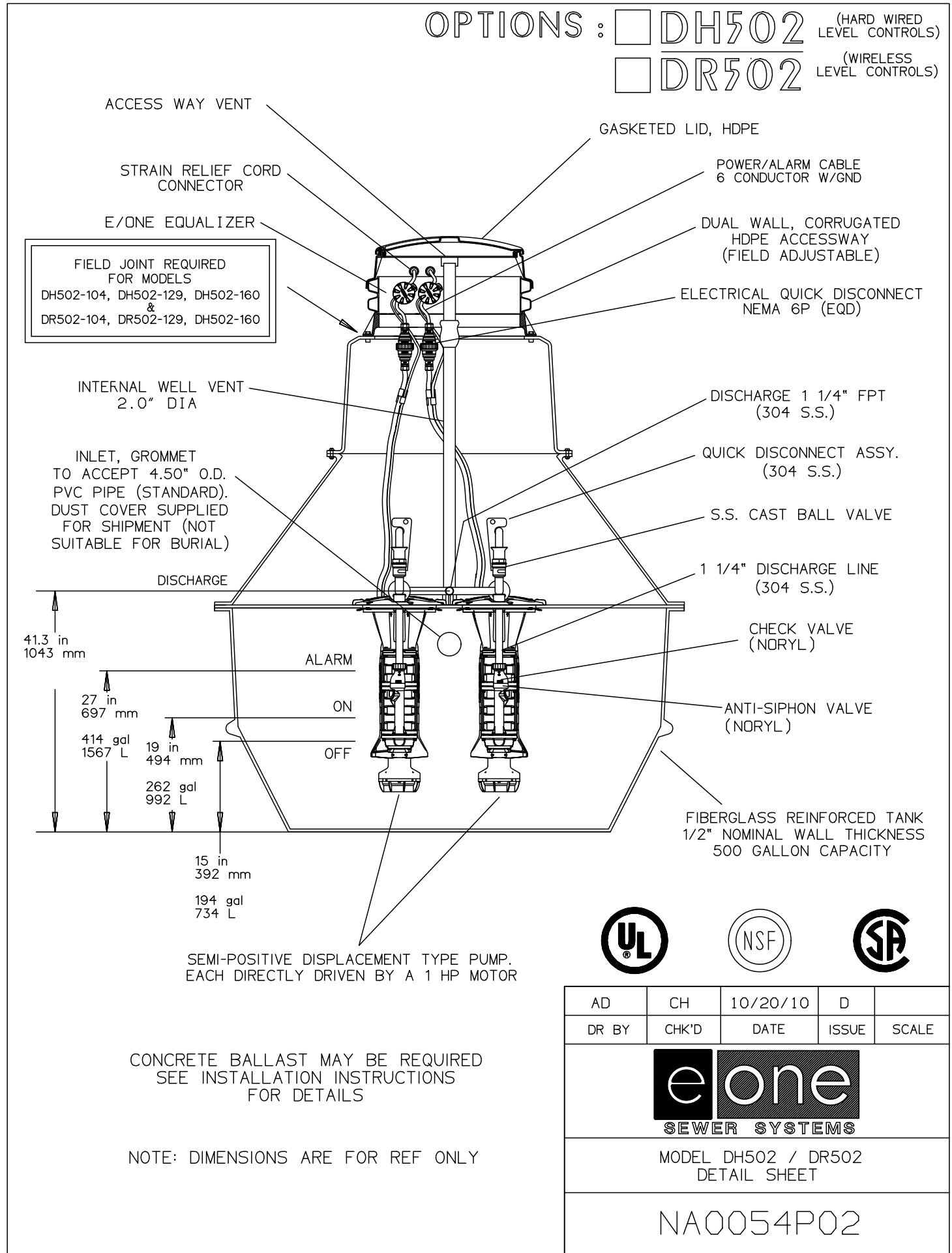


PRECAST CONCRETE CATCH BASIN DETAIL
N.T.S.



- Notes:
1. Install an Etheridge Foundry Casco Trap in all catch basins with a 12" or 15" outlet pipe
 2. The Casco Trap is an Etheridge style designed to eliminate cementing of the trap. To install, insert trap into outlet storm drain with the hood down.

CASCO TRAP DETAIL
N.T.S.



AD	CH	10/20/10	D	
DR BY	CHK'D	DATE	ISSUE	SCALE

eone
SEWER SYSTEMS

MODEL DH502 / DR502
DETAIL SHEET

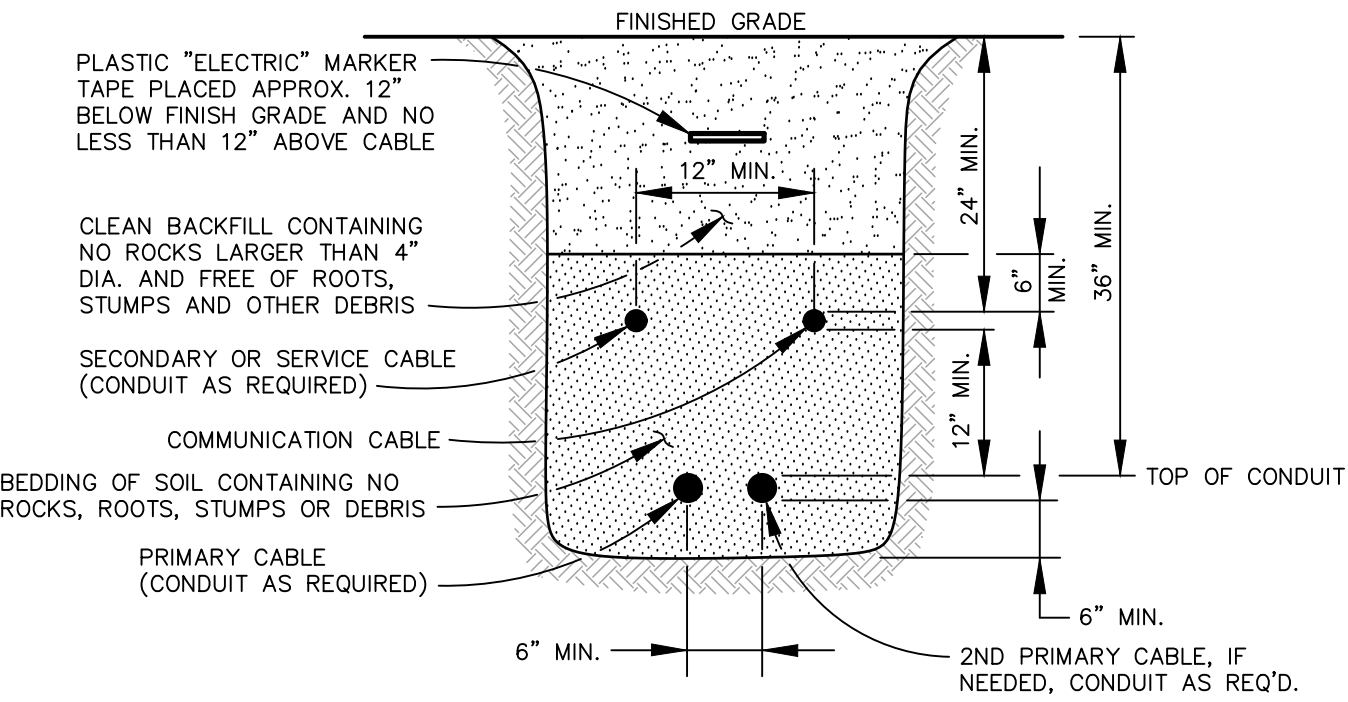
NA0054P02

NOTES:

INSTALLATION SHOULD NOT ALLOW THE INTER-TWING OF CABLES.

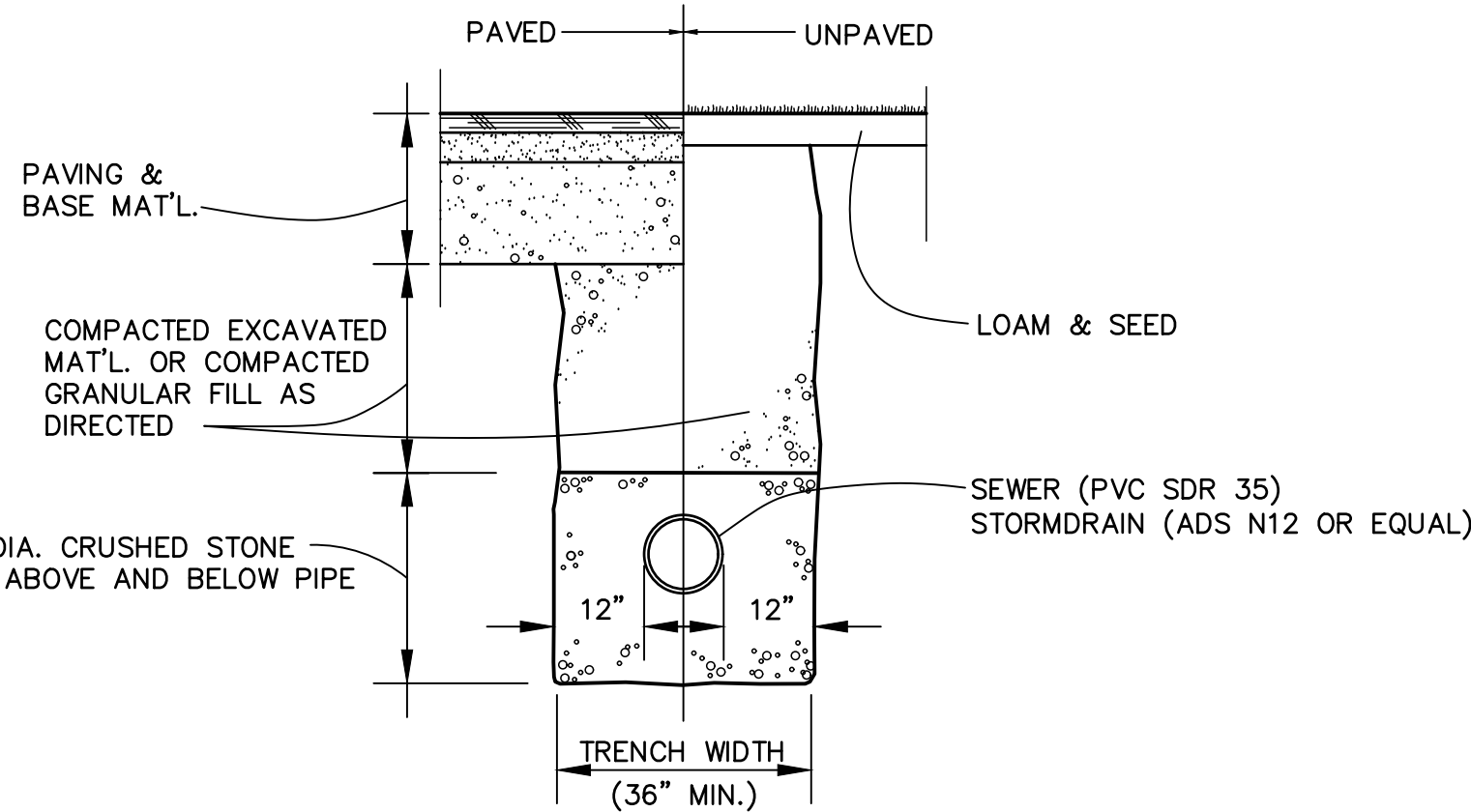
COMMUNICATION AND POWER CABLES SHALL HAVE NO LESS THAN 12" OF RADIAL SEPARATION.

CONDUITS FOR POWER AND COMMUNICATION CABLES SHALL BE SPECIFIED BY APPROPRIATE UTILITY COMPANIES.



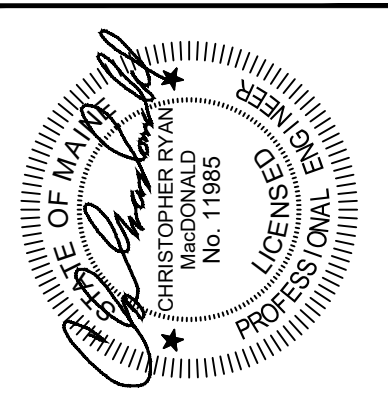
UNDERGROUND CABLE TRENCH
NTS

- NOTES:
1. Trench width shown is payment width for rockexcavation & replacement of unsuitable material.
 2. Do not mechanically compact directly over flexible pipe (e.g. PVC, Polyethylene)
 3. Concrete pipe shall have sand bedding.



TRENCH DETAIL
NTS

REVISION		DESCRIPTION
NO.	DATE	
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2	7/17/24	Submitted for Final Permit Application



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FOR
Avesta Housing
307 Cumberland Avenue
Portland, Maine

DETAILS B

AVESTA HOUSING PROJECT

BARRA ROAD
BIDDEFORD, MAINE

DESIGNED C. MacDonald	DATE May 2024
DRAWN Dept.	SCALE As Noted
CHECKED C. MacDonald	JOB. NO. 24017

SHEET

5

REPRODUCTION OR REUSE OF THIS DOCUMENT WITHOUT THE EXPRESSED WRITTEN CONSENT OF BH2M INC. IS PROHIBITED

- GRASSED UNDERDRAIN SOIL FILTER NOTES**
- REFERENCES**
- MAINE STORMWATER BEST MANAGEMENT PRACTICES (BMP), VOLUME III BMP TECHNICAL DESIGN MANUAL, CHAPTER 7 FILTRATION BMP'S (LATEST REVISION).
- CONSTRUCTION METHODS**
- THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION MATERIALS, INSTALLATION, MEANS, METHODS, AND SCHEDULING.
 - ALL WORK SHALL BE IN CONFORMANCE WITH THE PROJECT PLANS AND BMP'S REFERENCED ABOVE.
 - THE SOIL FILTER MEDIA AND VEGETATION SHALL NOT BE INSTALLED UNTIL THE AREA THAT DRAINS TO THE FILTER HAS BEEN PERMANENTLY STABILIZED WITH PAVEMENT OR OTHER STRUCTURES, 90% VEGETATION COVER OR PERMANENT STABILIZATION.
- DE-WATERING PLAN**
- DURING CONSTRUCTION OF THE SITE AND VEGETATED SOIL FILTER, THE CONTRACTOR SHALL BE PREPARED TO IMPLEMENT A DEWATERING PLAN IN ANTICIPATION OF HEAVY RAIN EVENTS.
 - THE AREA OF THE BASIN MAY BE EXCAVATED IN PREPARATION OF THE INSTALLATION OF THE UNDERDRAIN AND MAY BE USED FOR A SEDIMENT TRAP FOR THE SITE DURING CONSTRUCTION. AFTER EXCAVATION OF THE BASIN, THE OUTLET STRUCTURE AND PIPING SYSTEM SHALL BE INSTALLED AT THE APPROPRIATE ELEVATION AND PROTECTED WITH A SEDIMENT BARRIER. THE BASIN IS TO BE USED AS A SEDIMENT TRAP. THE SIDES OF THE EMBANKMENTS MUST BE MULCHED AND MAINTAINED TO PREVENT EROSION.
- SOIL MEDIA**
- THE SOIL MEDIA SHALL CONSIST OF SILTY SANDY SOIL OR SOIL MIXTURE COMBINED WITH 20% TO 25% BY VOLUME (NO LESS THAN 10% BY DRY WEIGHT) OF MODERATELY SHREDED BARK OR WOOD FIBER MULCH.
 - THE SOIL FILTER MEDIA SAND SHALL MEET THE GRADATION IN TABLE 7-2 (MDOOT 703.01) WITH ADDITIONAL FINES ADDED IF NECESSARY.
 - THE RESULTING SOIL FILTER MEDIA SHALL HAVE 8% TO 12% BY WEIGHT PASSING THE #200 SIEVE AND SHALL HAVE A CLAY CONTENT OF LESS THAN 2%.
 - THE COARSE GRAVEL MATERIAL SHALL MEET THE GRADATION OF TABLE 7.1 (MDOOT 703.22 UNDERDRAIN, TYPE B).
 - THE FILTER MEDIA SHALL BE LIGHTLY COMPACTED BY SATURATING THE MEDIA IN 6" TO 9" LIFTS AND SHALL HAVE A PERMEABILITY OF 2.4 IN/HR TO 4 IN/HR.
 - THE CLAY CONTENT SHALL BE < 2%.
- CONSTRUCTION**
- SOIL FILTER MEDIA, COARSE GRAVEL, AND UNDERDRAIN BEDDING MATERIAL SHALL BE COMPACTED TO BETWEEN 90% AND 92% STANDARD PROCTOR.
 - PERFORATED UNDERDRAIN PIPE SHALL BE 4" AND 6" SCHEDULE 40 OR SDR 35 PVC PIPE. SPACED 8 FEET AND 4 FEET ON CENTER AS SHOWN ON PLANS.
 - TRIBUTARY AREAS SHALL BE STABILIZED PRIOR TO INSTALLATION OF THE SOIL FILTER MEDIA MIXTURE AND UNDERDRAIN. STABILIZED IS DEFINED AS PAVED IF IN A PARKING AREA OR ROADWAY AND 90% GRASS CATCH IF IN A VEGETATED AREA.
 - OUTFLOW OF THE VEGETATED SOIL FILTER SHALL BE CONTROLLED BY A 2" PLASTIC TYPE 34-6 BALL VALVE WITH TYPE 615 BALL VALVE HANDLE EXTENSION (AVAILABLE FROM E.J. PRESCOTT OR EQUIVALENT). A THREE-PIECE VALVE BOX (AVAILABLE FROM E.J. PRESCOTT OR EQUIVALENT) SHALL BE INSTALLED OVER THE VALVE.
 - ALL EQUIPMENT USED WITHIN THE LIMITS OF THE VEGETATED SOIL FILTER SHALL BE LOW GROUND PRESSURE VEHICLES (LESS THAN 2.0 PSI) WHEN FULLY LOADED.
 - IF VEGETATION IS NOT ESTABLISHED WITHIN THE FIRST YEAR, THE CONTRACTOR SHALL INSTALL A 2-3 INCH LAYER OF LOAM (WITH LESS THAN 2% CLAY AS TESTED VIA HYDROMETER TEST) ON THE SURFACE OF THE GRASS FILTER AND RE-SEED MULCH.
 - THE SURFACE OF THE VEGETATED SOIL FILTER SHALL BE CONTROLLED BY A GRASS SPECIES THAT IS TOLERANT OF FREQUENT INUNDATION AND WELL-DRAINED SOILS. UPON SEEDING, THE SURFACES SHALL BE MULCHED WITH HAY OR AN EROSION CONTROL BLANKET BUT SHALL NOT BE FERTILIZED. AN APPROPRIATE SEED MIXTURE SHOULD CONTAIN THE FOLLOWING OR BE AN EQUIVALENT CONSERVATION TYPE MIX:

SEEDING	SEEDING
CREeping RED FESCUE	20 LBS/ACRE
TALL FESCUE	20 LBS/ACRE
BRIDGEFOOT TREFOIL	8 LBS/ACRE
TOTAL	48 LBS/ACRE

TESTING AND SUBMITTALS

- THE CONTRACTOR SHALL IDENTIFY THE LOCATION OF THE SOURCE OF EACH COMPONENT OF THE FILTER MEDIA. ALL TESTING RESULTS SHALL BE SUBMITTED TO THE PROJECT ENGINEER.
- SUBMIT SAMPLES OF EACH TYPE OF MATERIAL TO BE BLENDED FOR THE MIXED FILTER MEDIA AND SAMPLES OF THE UNDERDRAIN BEDDING MATERIAL. SAMPLES MUST BE A COMPOSITE OF THREE DIFFERENT LOCATIONS (GRABS) FROM THE STOCKPILE OR PIT FACE. SAMPLE SIZE WILL BE DETERMINED BY TESTING LABORATORY.
- THE CONTRACTOR SHALL PERFORM A SIEVE ANALYSIS CONFORMING TO ASTM C136 (STANDARD TEST METHODS FOR SIEVE ANALYSIS OF FINE AND COARSE AGGREGATES, 1996A) ON EACH TYPE OF SAMPLE MATERIAL INCLUDING A HYDROMETER TEST FOR CLAY CONTENT.
- THE CONTRACTOR SHALL PERFORM A PERMEABILITY TEST ON THE SOIL MEDIA MIXTURE CONFORMING TO ASTM D2434.
- THE CONTRACTOR SHALL PERFORM ONE COMPACTION DENSITY TEST ON THE IN-PLACE SOIL FILTER MEDIA FOR EVERY 1,500 S.F. OF BED OR FRACTION THEREOF. THE TEST SHALL CONFORM TO ASTM 2922.
- UPON COMPLETION OF THE VEGETATED SOIL FILTER MEDIA AND THE ESTABLISHMENT OF 90% CATCH OF GRASS OVER THE FILTER MEDIA, THE CONTRACTOR SHALL FLOOD THE VEGETATED BASIN TO THE SPILLWAY WITH CLEAR WATER AND ADJUST THE OUTFLOW TO OBTAIN A 24-HOUR TO 32-HOUR RELEASE TIME.

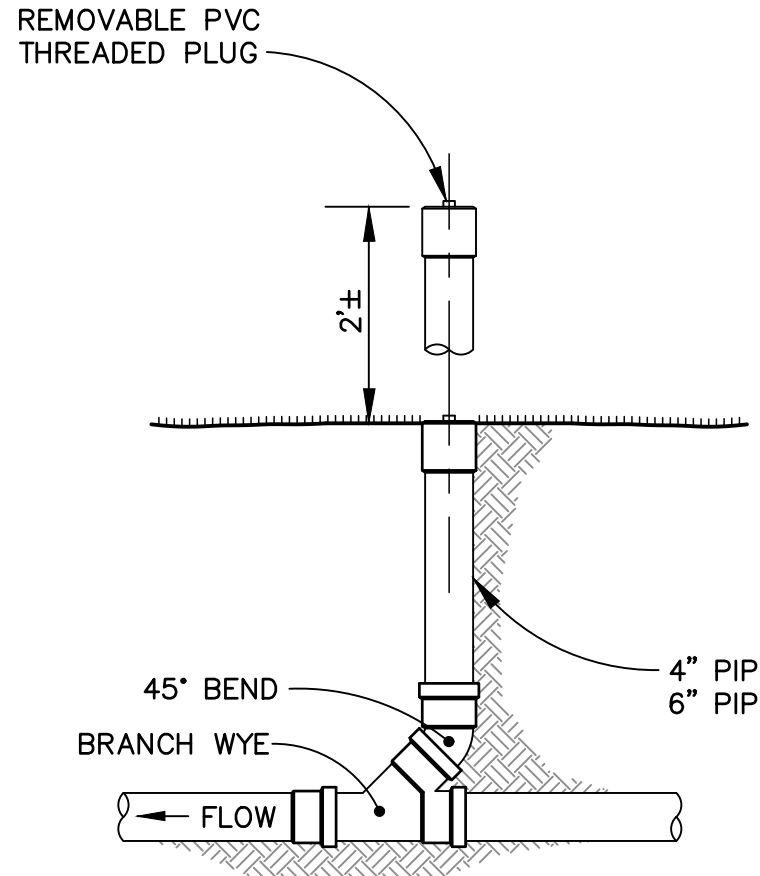
CONSTRUCTION OVERSIGHT

- THE CONTRACTOR SHALL MEET THE "CONSTRUCTION OVERSIGHT" SECTION OF CHAPTER 7, FILTRATION BMP'S (REVISED MAY 2016) OF THE STORMWATER MANAGEMENT FOR MAINE, VOLUME III, BMP'S TECHNICAL DESIGN MANUAL.
- THE DESIGN ENGINEER SHALL BE CONDUCTING PERIODIC SITE OVERSIGHT OF THE CONSTRUCTION AS DESCRIBED BELOW AND IN COMPLIANCE WITH THE PERMITS.
- THE ENGINEER SHALL REVIEW AND APPROVE ALL CONTRACTOR SUBMITTALS.
- THE CONTRACTOR SHALL GIVE THE ENGINEER A PROPOSED CONSTRUCTION SCHEDULE AND A 48-HOUR NOTICE FOR ALL SITE VISITS.
- INSPECTIONS SHALL INCLUDE:
 - PRE-CONSTRUCTION MEETING WITH CONTRACTOR
 - INSPECTION OF SUBGRADE EXCAVATION (IF USED FOR SEDIMENT TRAP, INSPECTION AFTER RESHAPED)
 - INSPECTION OF LINER WHEN IN PLACE (PRIOR TO BACKFILL AND INSTALLATION OF FILTER MATERIALS)
 - AFTER FILTER MEDIA HAS BEEN INSTALLED AND SURFACE HAS BEEN SEED
 - AFTER ONE YEAR TO INSPECT VEGETATION UPTAKE AND OBSERVE FLOODING TEST IF CONDUCTED

TABLE 7-1 UNDERDRAIN SPECS. MDOOT #703.22	
SEIVE SIZE	% BY WEIGHT
1"	90-100
1/2"	75-100
#4	50-100
#20	15-60
#50	0-15
#200	0-5

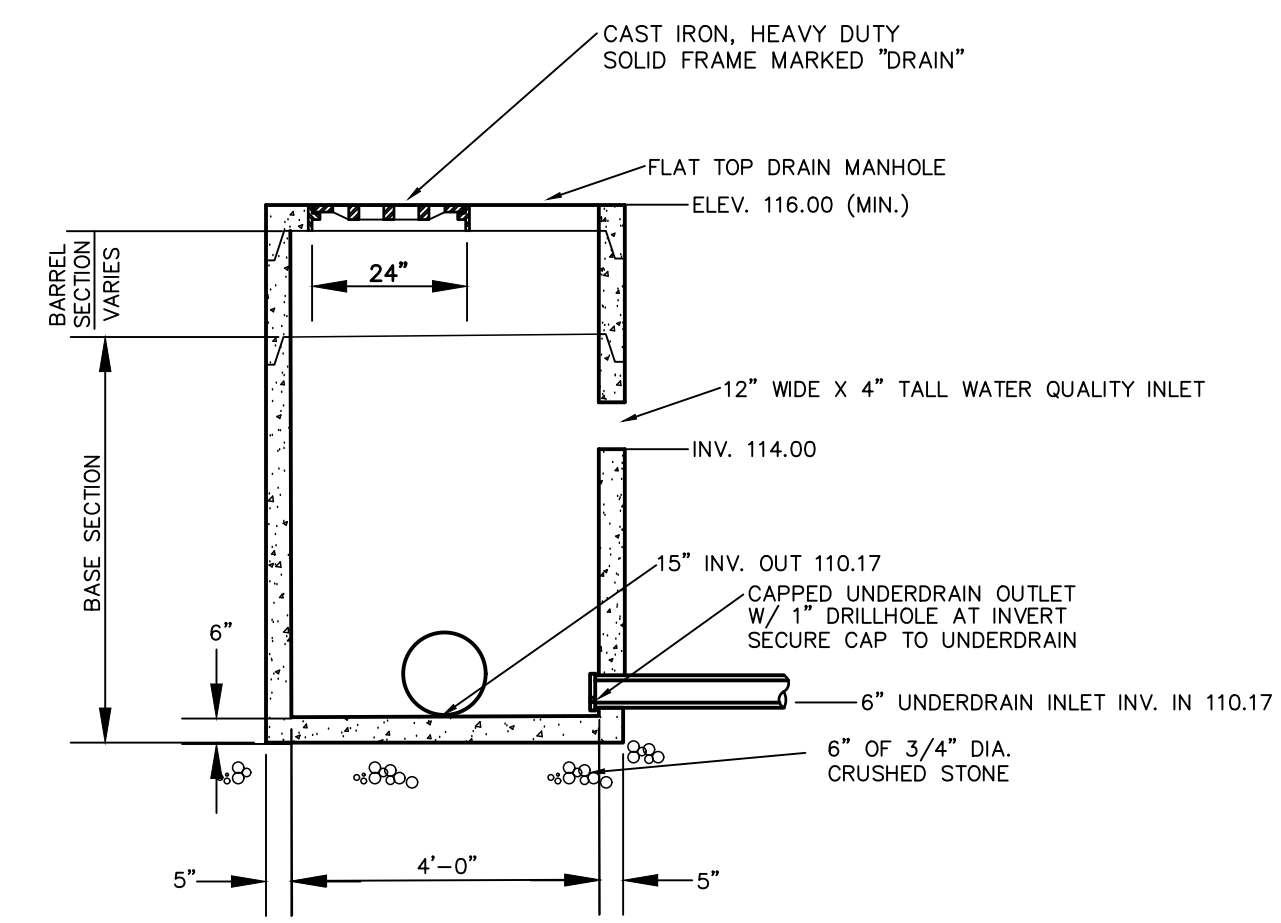
TABLE 7-2 AGGREGATE SPECS. MDOOT #703.01	
SEIVE SIZE	% BY WEIGHT
3/8"	100
3/4"	90-100
#4	0-75
#10	0-25
#20	0-5

TABLE 7-4 COARSE LOAMY SAND SIEVE ANALYSIS SPECIFICATION	
SIEVE #	% PASSING BY WEIGHT
#10	85-100
#20	70-100
#50	15-40
#200	6-15

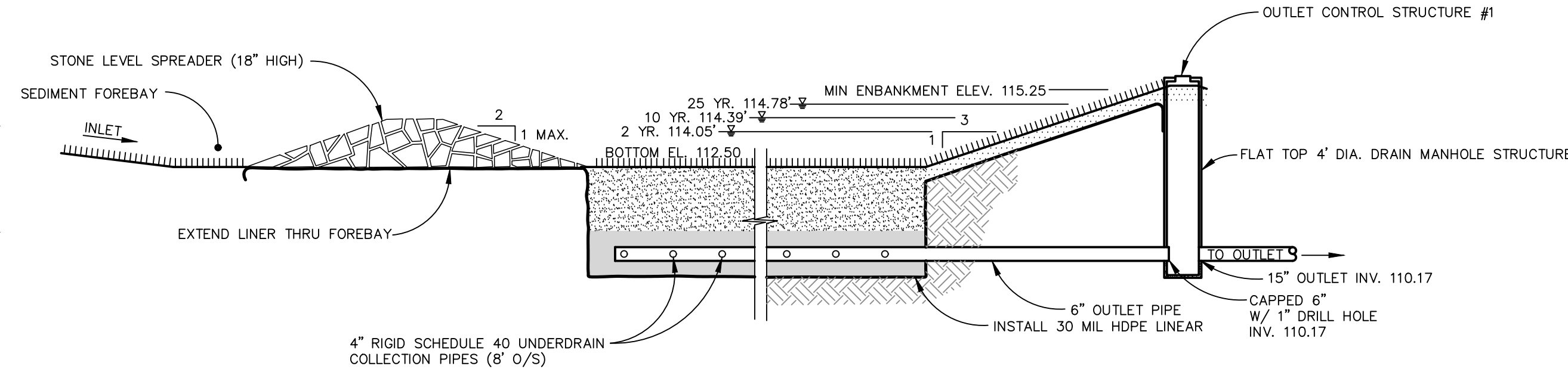


CLEANOUT DETAIL
N.T.S.

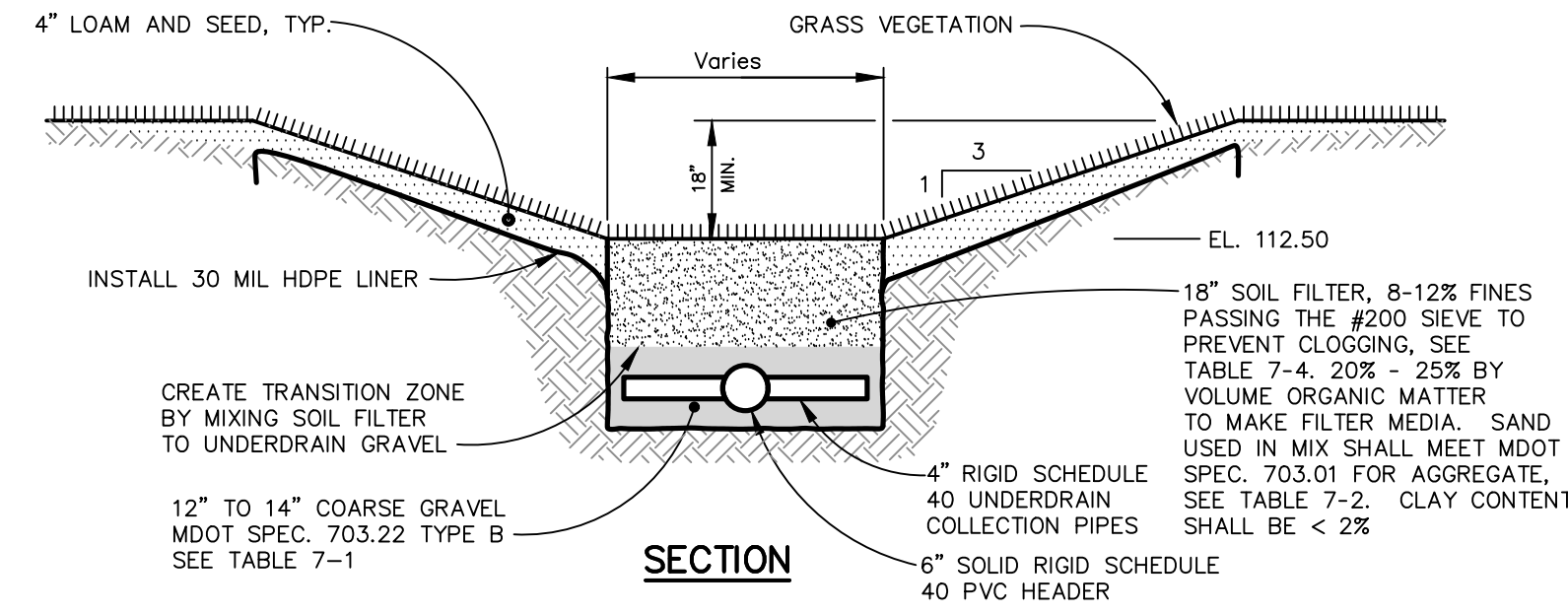
LEVEL SPREADER STONE SIZE		
SIEVE DISIGNATION	SIEVE DISIGNATION	% BY WEIGHT PASSING
METRIC	US CUSTOMARY	SQUARE MESH SIEVES
300 MM	12"	100
150 MM	6"	84-100
75 MM	3"	68-83
25.4 MM	1"	42-55
4.75 MM	NO. 4	8-12



OUTLET CONTROL STRUCTURE 1
N.T.S.

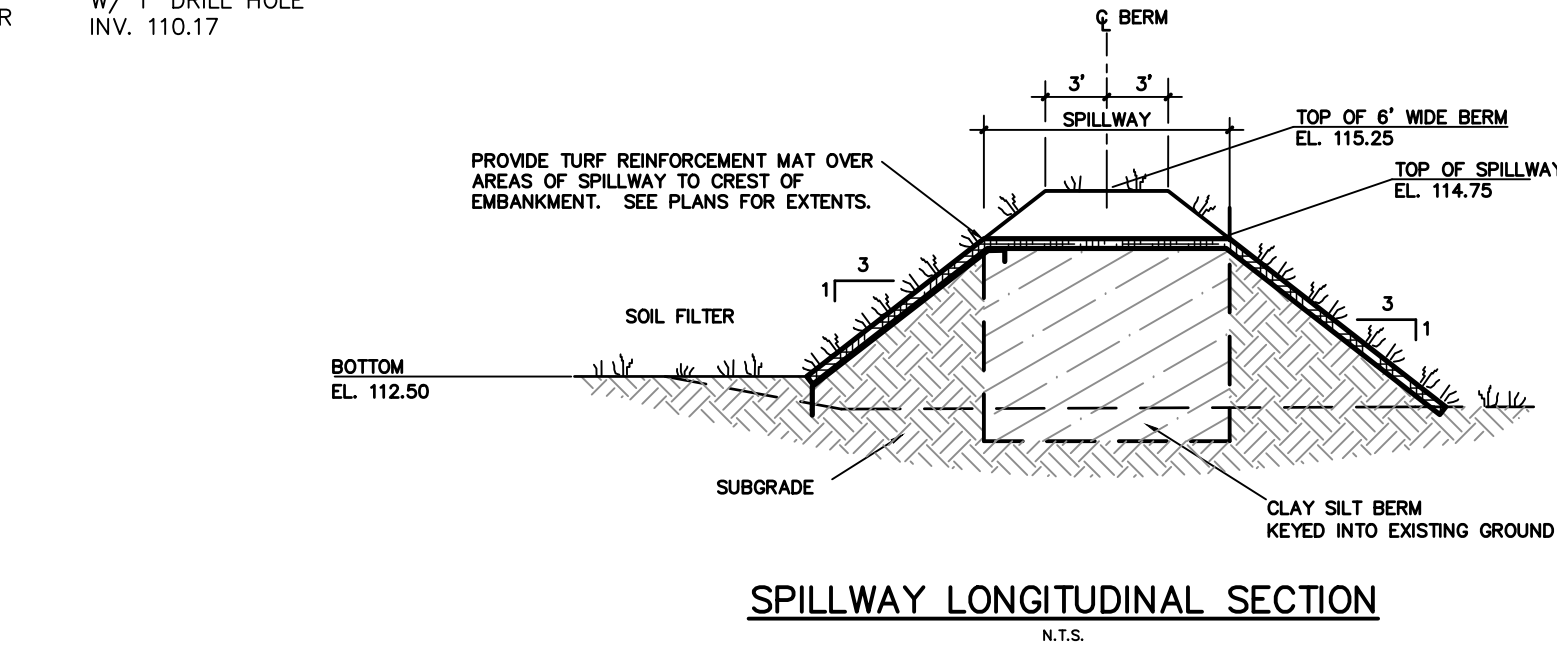


PROFILE

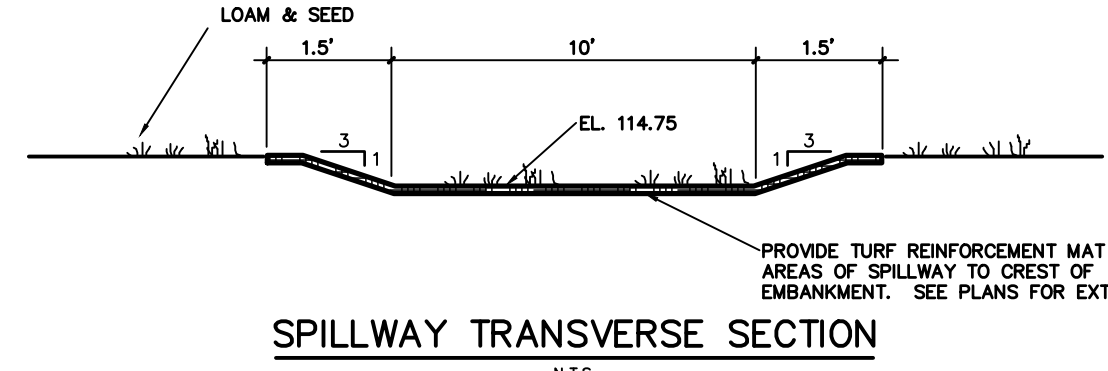


SECTION

GRASSED UNDERDRAIN
SOIL FILTER
N.T.S.

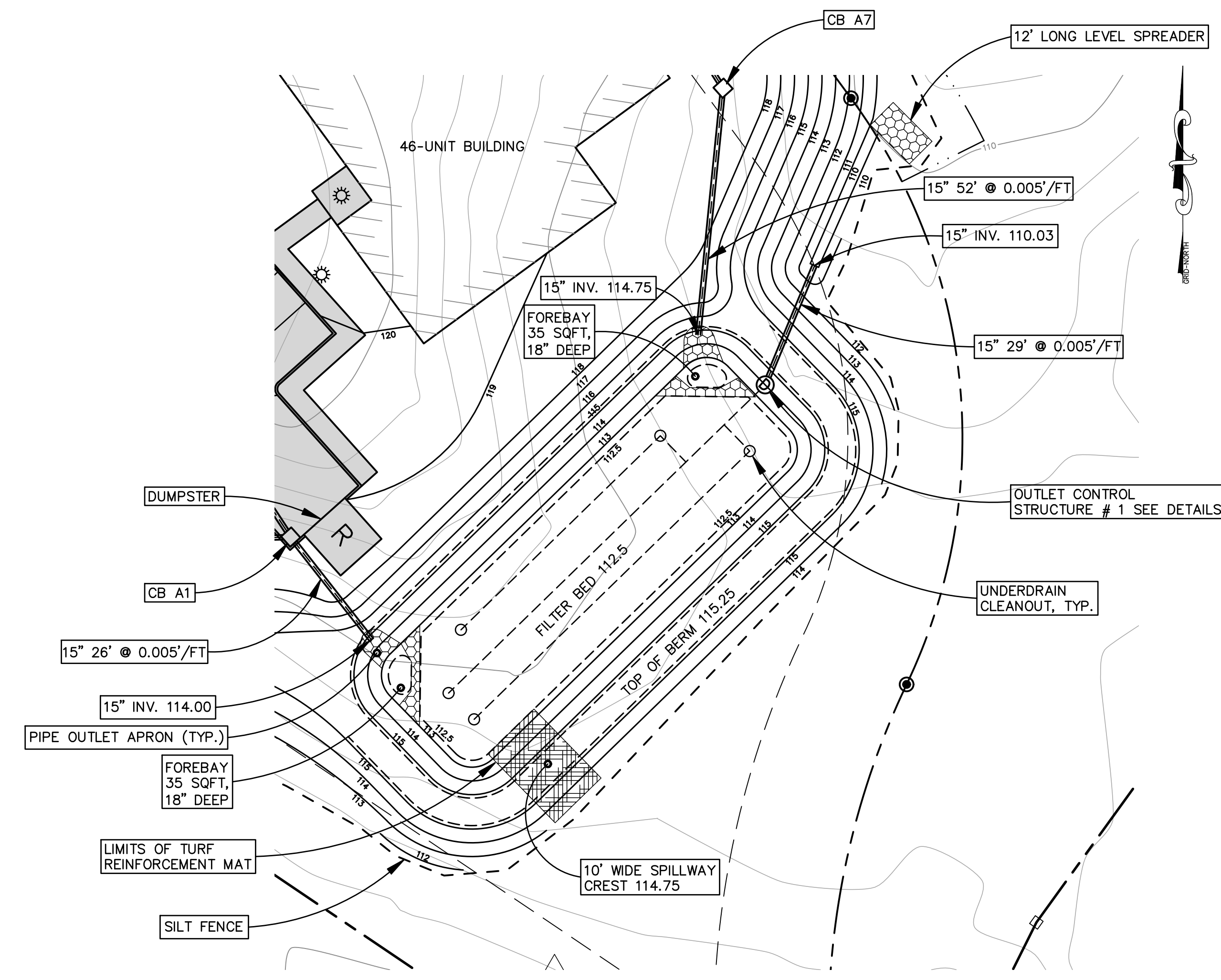


SPILLWAY LONGITUDINAL SECTION
N.T.S.

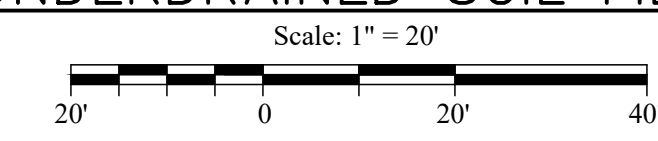


SPILLWAY TRANSVERSE SECTION
N.T.S.

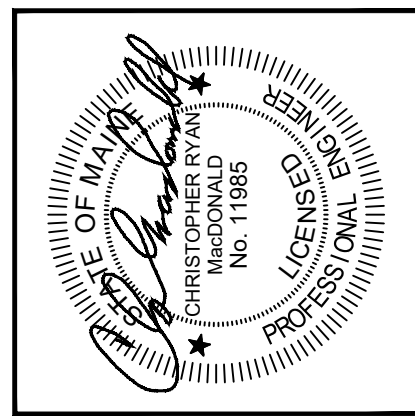
EMBANKMENT AND SPILLWAY DETAIL
N.T.S.



GRASSED UNDERDRAINED SOIL FILTER 1 PLAN



REVISION	DESCRIPTION	NO.	DATE
1	Submitted for Preliminary Permit Application	1	5/15/24
2	Submitted for Final Permit Application	2	7/17/24



BH2M

Berry, Huff, MacDonald, Miligan Inc.
Engineers, Surveyors

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FOR
Avesta Housing
307 Cumberland Avenue
Portland, Maine

GRASSED UNDERDRAINED
SOIL FILTER 1 DETAILS

AVESTA HOUSING PROJECT

BARRA ROAD
BIDDEFORD, MAINE

DESIGNED C. MacDonald	DATE May 2024
DRAWN Staff	SCALE As Noted
CHECKED C. MacDonald	JOB. NO. 24017

SHEET
6

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EROSION AND SEDIMENT CONTROL PLAN

THIS PLAN HAS BEEN DEVELOPED AS A STRATEGY TO CONTROL SOIL EROSION AND SEDIMENTATION DURING AND AFTER CONSTRUCTION. THIS PLAN IS BASED ON THE STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION IN DEVELOPING AREAS AS CONTAINED IN THE LATEST REVISION OF TO THE 2016 MAINE EROSION AND SEDIMENT CONTROL BMP'S MANUAL FOR DESIGNERS AND ENGINEERS, AND THE LATEST REVISION TO THE 2014 MAINE EROSION AND SEDIMENT CONTROL FIELD GUIDE FOR CONTRACTORS. SEE MANUALS FOR ADDITIONAL INFORMATION AND DETAILS. A WRITTEN INSPECTION AND MAINTENANCE MANUAL HAS BEEN PREPARED FOR THIS SITE. PLEASE REFER TO THIS FOR ADDITIONAL REPORTS AND INSPECTION REQUIREMENTS FOR BOTH DURING AND AFTER CONSTRUCTION.

THE PROPOSED LOCATIONS OF SILTATION AND EROSION CONTROL STRUCTURES ARE SHOWN ON THE SITE PLAN.

- ALL CONSTRUCTION INSPECTIONS SHALL BE CONDUCTED BY SOMEONE WITH KNOWLEDGE OF EROSION AND STORMWATER CONTROL, INCLUDING STANDARDS AND PERMIT CONDITIONS. CONSTRUCTION INSPECTIONS SHALL BE PERFORMED AT LEAST ONCE A WEEK, AND PRIOR TO AND 24 HOURS AFTER A WET WEATHER EVENT (0.5 INCHES OR MORE IN A 24 HOUR PERIOD). CONSTRUCTION INSPECTION AND CORRECTIVE ACTION DOCUMENTATION RECORDS SHALL BE MAINTAINED FOR A MINIMUM OF 5 YEARS.
- THE SCOPE OF CONSTRUCTION INSPECTIONS INCLUDES THE EROSION AND SEDIMENTATION CONTROL MEASURES AS WELL AS DISTURBED AREAS, MATERIAL STORAGE AREAS, AND LOCATIONS WHERE VEHICLES ENTER AND EXIT THE SITE.
- ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE DONE IN ACCORDANCE WITH THE "MAINE EROSION AND SEDIMENT CONTROL BMP'S", DEPARTMENT OF ENVIRONMENTAL PROTECTION, LATEST REVISION.
- THOSE AREAS UNDERGOING ACTUAL CONSTRUCTION WILL BE LEFT IN AN UNTREATED OR UNVEGETATED CONDITION FOR A MINIMUM TIME. AREAS SHALL BE PERMANENTLY STABILIZED WITHIN 7 DAYS OF FINAL GRADING AND TEMPORARILY STABILIZED WITHIN 7 DAYS OF INITIAL DISTURBANCE OF THE SOIL. IF THE DISTURBANCE IS WITHIN 75 FEET OF A WETLAND OR WATERBODY, THE AREA SHALL BE STABILIZED WITHIN 2 DAYS OR PRIOR TO ANY STORM EVENT, WHICHEVER COMES FIRST.
- EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 10 ACRES OF THE SITE IS WITHOUT STABILIZATION AT ANY ONE TIME.
- EXPOSED AREA SHOULD BE LIMITED TO THAT WHICH CAN BE MULCHED IN ONE DAY.
- CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED SUCH THAT NO MORE THAN ONE ACRE OF THE SITE IS WITHOUT EROSION CONTROL PROTECTION.
- SEDIMENT BARRIERS (EROSION CONTROL MIX, STONE CHECK DAMS, STABILIZATION CONSTRUCTION ENTRANCE, ETC.) SHOULD BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM. THE CONTRACTOR SHALL MAINTAIN THE STABILIZED CONSTRUCTION ENTRANCE UNTIL ALL DISTURBED AREAS ARE STABILIZED.
- INSTALL EROSION CONTROL MIX AT TOE OF SLOPES TO FILTER SILT FROM RUNOFF. SEE E.C.M. MIX DETAIL FOR PROPER INSTALLATION. EROSION CONTROL MIX WILL REMAIN IN PLACE PER THE USE OF AN EROSION CONTROL MIX BERM IS PROHIBITED AT THE BASE OF SLOPES STEEPER THAN 8% OR WHERE THERE IS FLOWING WATER.
- ALL EROSION CONTROL STRUCTURES WILL BE INSPECTED, REPLACED, AND/OR REPAIRED EVERY 7 DAYS AND IMMEDIATELY BEFORE AND FOLLOWING ANY SIGNIFICANT RAINFALL (0.5 INCH OR MORE IN A 24-HOUR PERIOD) OR SNOW MELT OR WHEN NO LONGER SERVICEABLE DUE TO SEDIMENT ACCUMULATION OR DECOMPOSITION. IF AN INSPECTION DETERMINES THAT A CORRECTIVE ACTION IS REQUIRED, THE ACTION OR REPAIR SHALL BE STARTED BY THE END OF THE NEXT WORKDAY AND COMPLETED WITHIN SEVEN DAYS BEFORE THE NEXT STORM EVENT. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER. SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS ABOVE ARE STABILIZED BY TURF. EROSION CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS OF PERMANENT STABILIZATION. PERMANENT STABILIZATION IS 90% GRASS CATCH IN VEGETATED AREAS.
- NO SLOPES, EITHER PERMANENT OR TEMPORARY, SHALL BE STEEPER THAN ONE AND ONE HALF TO ONE (1.5 TO 1).
- IF FINAL SEEDING OF THE DISTURBED AREAS IS NOT COMPLETED 45 DAYS PRIOR TO THE FIRST KILLING FROST, USE TEMPORARY MULCHING (DORMANT SEEDING MAY BE ATTEMPTED AS WELL) TO PROTECT THE SITE AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING DATE.
- TEMPORARY SEEDING OF DISTURBED AREAS THAT HAVE NOT BEEN FINAL GRADED SHALL BE COMPLETED BY AUG. 15 OR 45 DAYS PRIOR TO THE FIRST KILLING FROST (OCT. 1) TO PROTECT FROM SPRING RUNOFF PROBLEMS.
- DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT WILL BE RETURNED TO THE SITE AND REGRADED ONTO OPEN AREAS. POST SEEDING SEDIMENT, IF ANY, WILL BE DISPOSED OF IN AN ACCEPTABLE MANNER.
- REVEGETATION MEASURES WILL COMMENCE UPON COMPLETION OF CONSTRUCTION EXCEPT AS NOTED ABOVE. ALL DISTURBED AREAS NOT OTHERWISE STABILIZED WILL BE GRADED, SMOOTHED, AND PREPARED FOR FINAL SEEDING AS FOLLOWS:
 - APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL, FERTILIZER MAY BE APPLIED AT THE RATE OF 800 POUNDS PER ACRE OR 18.4 POUNDS PER 1,000 SQUARE FEET USING 10-20-20 (N-P205-K20) OR EQUIVALENT. APPLY GROUND LIMESTONE (EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE (138 LB PER 1,000 SQ. FT.).
 - HAY MULCH AT THE RATE OF 70-90 LBS PER 1,000 SQUARE FEET FOR OVER 75% COVERAGE. FOR UNPROTECTED OR WINDY AREAS, ANCHOR MULCH WITH PEG AND TWINE (1 SQ. YD. BLOCK). HYDRAULIC MULCHES MAY ALSO BE USED, APPLIED AT A RATE OF 5 LBS PER 1,000 SQUARE FEET FOR PAPER MULCH OR 40 LBS PER 1,000 SQUARE FEET OR AS DIRECTED BY THE MANUFACTURER. ON SLOPES GREATER THAN 3:1 EROSION CONTROL MIX MAY BE USED. SEE EROSION CONTROL MIX NOTES BELOW.
 - FOR DISTURBED AREAS TO BE MAINTAINED IN POST-CONSTRUCTION AS A MEADOW BUFFER, APPLY A 50-50 MIX OF ERNST FUZZ N' BUZZ PREMIUM AND NATIVE CLOVER MIX AT SUPPLIERS RECOMMENDED APPLICATION RATES.
- ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS ONCE THE SITE IS STABILIZED WITH 90% GRASS CATCH IN VEGETATED AREAS. TEMPORARY EROSION AND SEDIMENT CONTROL BLANKET SHALL BE USED IN ALL DITCHES AND SWALES AS SHOWN IN DETAILS.
- WETLANDS WILL BE PROTECTED WITH EROSION CONTROL MIX OR SILT FENCE INSTALLED AT THE EDGE FOR THE WETLAND OR THE BOUNDARY OF WETLAND DISTURBANCE. ALL AREAS WITHIN 75 FEET OF A PROTECTED NATURAL RESOURCE MUST BE PROTECTED WITH A DOUBLE ROW OF SEDIMENT BARRIERS DURING WINTER CONSTRUCTION.
- ALL STORMWATER WILL BE PREVENTED FROM RUNNING ONTO STOCKPILES. SEDIMENT BARRIERS WILL BE INSTALLED DOWNGRADIENT OF ALL STOCKPILES.
- PERMANENT POST-CONSTRUCTION BMP'S (VEGETATED SWALES, WET PONDS, ETC.) WILL NOT BE USED TO MANAGE FLOWS DURING CONSTRUCTION WITHOUT SPECIAL PROTECTION AND/OR RESTORATION.

ADDITIONAL TEMPORARY SEED MIXTURE (FOR PERIODS LESS THAN 12 MONTHS):

SEED	RATE
ERNST WINTER RYEGRASS	112 LBS/ACRE

EROSION CONTROL MIX

EROSION CONTROL MIX (ECM) SHALL MEET THE REQUIREMENTS PROVIDED IN THE LATEST REVISION OF MAINE DEP'S EROSION AND SEDIMENTATION CONTROL BMP MANUAL. ECM IS ACCEPTABLE FOR USE ON SLOPES OF GREATER THAN 3:1 BUT LESS THAN 1:1. ECM SHALL CONSIST OF WELL-GRADED ORGANIC MATERIAL 50 - 100% OF DRY WEIGHT, AND COMPRSED OF FIBROUS AND ELONGATED FRAGMENTS. ECM SHALL BE FREE FROM REFUSE, MATERIAL TOXIC TO PLANT GROWTH OR CONSTRUCTION DEBRIS. ECM SHALL BE EVENLY ANCHORED AND APPLIED AT A THICKNESS OF 2" ON 3:1 SLOPES, WITH AN ADDITIONAL 1/2" PER 20" OF SLOPE FOR A MAXIMUM OF 100' IN LENGTH. SLOPES GREATER THAN 3:1, ECM SHALL BE APPLIED AT THICKNESS OF 4" OR 5" FOR SLOPES GREATER THAN 60' IN LENGTH.

SLOPES GREATER THAN 3:1 MAY ALSO REQUIRE ADDITIONAL SLOPE STABILIZATION DEPENDING ON UPGRADIENT RUNOFF AND OTHER SITE SPECIFIC CONDITIONS. SEE SLOPE STABILIZATION DETAIL FOR ADDITIONAL INFORMATION.

CONSTRUCTION SPECIFICATIONS

- LOCATE WASHOUT STRUCTURE A MINIMUM OF 50 FEET AWAY FROM OPEN CHANNELS, STORM DRAIN INLETS, SENSITIVE AREAS, WETLANDS, BUFFERS AND WATER COURSES AND AWAY FROM CONSTRUCTION TRAFFIC.
- SIZE WASHOUT STRUCTURE FOR VOLUME NECESSARY TO CONTAIN WASH WATER AND SOLIDS AND MAINTAIN AT LEAST 4 INCHES OF FREEBOARD. TYPICAL DIMENSIONS ARE 10 FEET X 10 FEET X 3 FEET DEEP.
- PREPARE SOIL BASE FREE OF ROCKS OR OTHER DEBRIS THAT MAY CAUSE TEARS OR HOLES IN THE LINER. FOR LINER, USE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING, FREE OF HOLES AND TEARS OR OTHER DEFECTS THAT COMPROMISE IMPERMEABILITY OF THE MATERIAL.
- PROVIDE A SIGN FOR THE WASHOUT IN CLOSE PROXIMITY TO THE FACILITY.
- KEEP CONCRETE WASHOUT STRUCTURE WATER TIGHT. REPLACE IMPERMEABLE LINER IF DAMAGED (E.G., RIPPED OR PUNCTURED). EMPTY OR REPLACE WASHOUT STRUCTURE THAT IS 75 PERCENT FULL, AND DISPOSE OF ACCUMULATED MATERIAL PROPERLY. DO NOT REUSE PLASTIC LINER. WET-VACUUM STORED LIQUIDS THAT HAVE NOT EVAPORATED AND DISPOSE OF IN AN APPROVED MANNER. PRIOR TO FORECASTED RAINSTORMS, REMOVE LIQUIDS OR COVER STRUCTURE TO PREVENT OVERFLOWS. REMOVE HARDENED SOLIDS, WHOLE OR BROKEN UP, FOR DISPOSAL OR RECYCLING. MAINTAIN RUNOFF DIVERSION AROUND EXCAVATED WASHOUT STRUCTURE UNTIL STRUCTURE IS REMOVED.

CONCRETE WASHOUT STRUCTURE
N.T.S.

EROSION CONTROL DURING CONSTRUCTION

WINTER CONSTRUCTION

- WINTER CONSTRUCTION PERIOD: NOVEMBER 1 THROUGH APRIL 15
- OVERWINTER STABILIZATION OF DITCHES AND CHANNELS:
 - ALL STONE-UNITED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED BY NOVEMBER 15. ALL GRASS LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED BY SEPTEMBER 1. IF A DITCH OR CHANNEL IS NOT GRASS-LINED BY SEPTEMBER 1, THEN ONE OF THE FOLLOWING ACTIONS MUST BE TAKEN TO STABILIZE THE DITCH FOR LATE FALL AND WINTER.
 - INSTALL A SOD LINING IN THE DITCH:

A DITCH MUST BE LINED WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES: PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL, AND ANCHORING SOD AT THE BASE OF THE DITCH WITH LATE OR PLASTIC MESH TO PREVENT THE SOD FROM SLOUGHING DURING FLOW CONDITIONS. SEE THE PERMANENT VEGETATION BMP SECTION.
 - INSTALL A STONE LINING IN THE DITCH:

A DITCH MUST BE LINED WITH STONE RIPRAP BY NOVEMBER 15. A REGISTERED PROFESSIONAL ENGINEER MUST BE HIRED TO DETERMINE THE STONE SIZE AND LINING THICKNESS NEEDED TO WITHSTAND THE ANTICIPATED FLOW VELOCITIES AND FLOW DEPTHS WITHIN THE DITCH. IF NECESSARY, THE CONTRACTOR WILL REGRADE THE DITCH PRIOR TO PLACING THE STONE LINING SO TO PREVENT THE STONE LINING FROM REDUCING THE DITCH'S CROSS-SECTIONAL AREA.
- OVERWINTER STABILIZATION OF DISTURBED SLOPES:
 - ALL STONE-COVERED SLOPES MUST BE CONSTRUCTED AND STABILIZED BY NOVEMBER 15. ALL SLOPES TO BE VEGETATED MUST BE SEEDED AND MULCHED BY SEPTEMBER 1. THE DEPARTMENT WILL CONSIDER ANY AREA HAVING A GRADE GREATER THAN 3:1 TO BE A SLOPE. IF A SLOPE TO BE VEGETATED IS NOT STABILIZED BY SEPTEMBER 1, THEN ONE OF THE FOLLOWING ACTIONS MUST BE TAKEN TO STABILIZE THE SLOPE FOR LATE FALL AND WINTER. STABILIZE THE SLOPE WITH TEMPORARY VEGETATION AND EROSION CONTROL MATS BY OCTOBER 1. THE DISTURBED SLOPE MUST BE SEEDED WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET AND THEN INSTALL EROSION CONTROL MATS OR ANCHORED MULCH OVER THE SEEDING. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR FAILS TO COVER AT LEAST 75% OF THE SLOPE BY NOVEMBER 1, THEN THE CONTRACTOR WILL COVER THE SLOPE WITH A LAYER OF EROSION CONTROL MIX OR WITH STONE RIPRAP AS DESCRIBED IN THE FOLLOWING STANDARDS.
 - STABILIZE THE SOIL WITH SOD:

THE DISTURBED SLOPE MUST BE STABILIZED WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE CONTRACTOR PINNING THE SOD ONTO THE SLOPE WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL. THE CONTRACTOR WILL NOT USE LATE SEASON SOD INSTALLATION TO STABILIZE SLOPES HAVING A GRADE GREATER THAN 3:1 (3H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
 - STABILIZE THE SOIL WITH EROSION CONTROL MIX:

EROSION CONTROL MIX MUST BE PROPERLY INSTALLED BY NOVEMBER 15. THE CONTRACTOR WILL NOT USE EROSION CONTROL MIX TO STABILIZE SLOPES HAVING GREATER THAN 50% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE. SEE THE EROSION CONTROL MIX NOTES FOR ADDITIONAL CRITERIA.
 - STABILIZE THE SOIL WITH STONE RIPRAP:

PLACE A LAYER OF STONE RIPRAP ON THE SLOPE BY NOVEMBER 15. THE DEVELOPMENTS OWNER WILL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE NEEDED FOR STABILITY ON THE SLOPE AND TO DESIGN A FILTER LAYER FOR UNDERNEATH THE RIPRAP.
- OVERWINTER STABILIZATION OF DISTURBED SLOPES:
 - BY SEPTEMBER 15, ALL DISTURBED SLOPES ON AREAS HAVING A SLOPE LESS THAN 10% MUST BE SEEDED AND MULCHED. IF THE DISTURBED AREAS ARE NOT STABILIZED BY THIS DATE, THEN ONE OF THE FOLLOWING ACTIONS MUST BE TAKEN TO STABILIZE THE SOIL FOR LATE FALL AND WINTER.
 - STABILIZE THE SOIL WITH TEMPORARY VEGETATION:

SEED THE DISTURBED SOIL WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET, LIGHTLY MULCH THE SEEDS WITH HAY OR STRAW AT 75 POUNDS PER 1000 SQUARE FEET, AND ANCHOR THE MULCH WITH PEG AND TWINE (1 SQ. YD. BLOCK). MONITOR GROWTH OF THE RYE. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR FAILS TO COVER AT LEAST 80% OF THE DISTURBED SOIL BEFORE NOVEMBER 1, THEN MULCH THE AREA FOR OVER-WINTER PROTECTION AS DESCRIBED BELOW.
 - STABILIZE THE SOIL WITH SOD:

STABILIZE THE DISTURBED SOIL WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL.
 - STABILIZE THE SOIL WITH MULCH:

BY NOVEMBER 15, MULCH THE DISTURBED SOIL BY SPREADING HAY OR STRAW AT A RATE OF AT LEAST 150 POUNDS PER 1000 SQUARE FEET ON THE AREA SO THAT NO SOIL IS EXPOSED TO THE MULCH. IMMEDIATELY AFTER APPLYING THE MULCH, ANCHOR THE MULCH WITH PLASTIC NETTING TO PREVENT WIND FROM MOVING THE MULCH OFF THE DISTURBED SOIL. PROVIDE NETTING ON ALL SLOPES GREATER THAN 8%.
- MAINTENANCE:
 - IF AN INSPECTION DETERMINES THAT A CORRECTIVE ACTION IS REQUIRED, THE ACTION OR REPAIR SHALL BE STARTED BY THE END OF THE NEXT WORKDAY AND COMPLETED WITHIN SEVEN DAYS OR BEFORE THE NEXT STORM EVENT. MAINTENANCE WORK SHALL BE COMPLETED DURING THE ENTIRE CONSTRUCTION SEASON. ONCE A WEEK AND BEFORE AND AFTER EACH RAINFALL, SNOW STORM OR PERIOD OF THAWING AND RUNOFF, THE SITE CONTRACTOR SHALL CONDUCT VISUAL INSPECTIONS OF ALL EROSION CONTROL MEASURES AND PERFORM REPAIRS AS NEEDED TO INSURE THEIR CONTINUOUS FUNCTION. FOLLOWING THE TEMPORARY AND/OR FINAL SEEDING AND MULCHING, THE CONTRACTOR SHALL, IN THE SPRING, INSPECT AND REPAIR ANY DAMAGES AND/OR BARE SPOTS. AN ESTABLISHED VEGETATIVE COVER MEANS A MINIMUM OF 60 TO 80% OF AREAS VEGETATED WITH VIGOROUS GROWTH.

STABILIZATION SCHEDULE BEFORE WINTER:

DATE	ACTION
SEPTEMBER 15	ALL DISTURBED AREAS MUST BE SEEDED AND MULCHED. ALL SLOPES MUST BE STABILIZED, SEEDS AND MULCHED. ALL GRASS LINED DITCHES AND CHANNELS MUST BE STABILIZED WITH MULCH OR AN EROSION CONTROL BLANKET
OCTOBER 1	IF THE SLOPE IS STABILIZED WITH AN EROSION CONTROL BLANKET AND SEEDS. ALL DISTURBED AREAS TO BE PROTECTED WITH AN ANCHORED GRASS MUST BE SEEDS AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET AND MULCHED.
NOVEMBER 15	ALL STONE LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED. SLOPES THAT ARE COVERED WITH RIPRAP MUST BE CONSTRUCTED BY THAT DATE.

DURING WINTER CONSTRUCTION PERIOD ALL SNOW SHALL BE REMOVED FROM AREAS OF SEEDING AND MULCHING PRIOR TO PLACEMENT.

AREAS WITHIN 75 FEET OF STREAMS, WETLANDS, AND OTHER PROTECTED NATURAL RESOURCES THAT ARE NOT STABILIZED WITH VEGETATION BY DEC. 1 SHALL BE MULCHED AND ANCHORED WITH NETTING. IF WORK CONTINUES IN THIS AREA DURING THE WINTER, A DOUBLE LINE OF SEDIMENT BARRIERS MUST BE USED.

HOUSEKEEPING

- SPILL PREVENTION: CONTROLS MUST BE USED TO PREVENT POLLUTANTS FROM BEING DISCHARGED FROM MATERIALS ON SITE, INCLUDING STORAGE PRACTICES TO MINIMIZE EXPOSURE OF THE MATERIALS TO STORMWATER, AND APPROPRIATE SPILL PREVENTION, CONTAINMENT, AND RESPONSE PLANNING AND IMPLEMENTATION.
- GROUNDWATER PROTECTION: DURING CONSTRUCTION, LIQUID PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS WITH THE POTENTIAL TO CONTAMINATE GROUNDWATER MAY NOT BE STORED OR HANDLED IN AREAS OF THE SITE DRAWING TO AN INFILTRATION AREA. AN "INFILTRATION AREA" IS ANY AREA OF THE SITE THAT BY DESIGN OR AS A RESULT OF SOILS, TOPOGRAPHY, AND OTHER RELEVANT FACTORS ACCUMULATES RUNOFF THAT INFILTRATES INTO THE GROUND. DURING CONSTRUCTION, AND OTHER FORMS OF SECONDARY CONTAMINATION THAT PREVENT DISCHARGE TO GROUNDWATER MAY BE USED TO ISOLATE PORTIONS OF THE SITE FOR THE PURPOSES OF STORAGE AND HANDLING OF THESE MATERIALS.
- EROSION CONTROL: EROSION CONTROL MEASURES MUST BE TAKEN TO ENSURE THAT ACTIVITIES DO NOT RESULT IN NOTICEABLE EROSION OF SOILS OR FUGITIVE DUST EMISSIONS DURING OR AFTER CONSTRUCTION. ON MY NOT BE USED FOR DUST CONTROL, ANY OFFSITE TRACKING OF MUD OR SEDIMENT SHALL BE VACUUMED IMMEDIATELY AND PRIOR TO THE NEXT SIGNIFICANT STORM EVENT.
- DEBRIS AND OTHER MATERIALS: LITTER, CONSTRUCTION DEBRIS, AND CHEMICALS EXPOSED TO STORMWATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.
- TRENCH OR FOUNDATION DE-WATERING: TRENCH DE-WATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, COFFER DAMS, PONDS, AND OTHER AREAS WITHIN THE CONSTRUCTION AREA THAT RETAIN WATER AFTER EXCAVATION. IN MOST CASES, THE COLLECTED WATER IS HEAVILY SILTED AND HINDERS CORRECT SAFE CONSTRUCTION PRACTICES. THE COLLECTED WATER MUST BE REMOVED FROM THE PONDED AREA, EITHER THROUGH GRAVITY OR PUMPING, AND MUST BE SPREAD THROUGH NATURAL WOODED BUFFERS OR REMOVED TO AREAS THAT ARE SPECIFICALLY DESIGNED TO COLLECT THE MAXIMUM AMOUNT OF SEDIMENT POSSIBLE. USE A COFFERDAM SEDIMENTATION BASIN AVOID ALLOWING THE WATER TO FLOW OVER DISTURBED AREAS OF THE SITE. EQUIVALENT MEASURES MAY BE TAKEN IF APPROVED BY THE DEPARTMENT.
- NON-STORMWATER DISCHARGES: IDENTIFY AND PREVENT CONTAMINATION BY NON-STORMWATER DISCHARGES, WHERE ALLOWED NON-STORMWATER DISCHARGES EXIST, THEY MUST BE IDENTIFIED AND STEPS SHOULD BE TAKEN TO ENSURE THE IMPLEMENTATION OF APPROPRIATE POLLUTION PREVENTION MEASURES FOR THE NON-STORMWATER COMPONENTS) OF THE DISCHARGE. AUTHORIZED NON-STORMWATER DISCHARGES ARE:
 - DISCHARGES FROM FIREFIGHTING ACTIVITY;
 - FIRE HYDRANT FLUSHINGS;
 - VEHICLE WASHWATER IF DETERGENTS ARE NOT USED AND WASHING IS LIMITED TO THE EXTERIOR OF VEHICLES (ENGINE, UNDERCARRIAGE AND TRANSMISSION WASHING IS PROHIBITED);
 - DUST CONTROL RUNOFF IN ACCORDANCE WITH PERMIT CONDITIONS AND APPENDIX C(3) OF MAINE DEP 06-096 CHAPTER 500;
 - ROUTINE EXTERNAL BUILDING WASHDOWN, NOT INCLUDING SURFACE PAINT REMOVAL, THAT DOES NOT INVOLVE DETERGENTS;
 - PAVEMENT WASHWATER (WHERE SPILLS/LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAVE NOT OCCURRED, UNLESS ALL SPILLED MATERIAL HAD BEEN REMOVED) IF DETERGENTS ARE NOT USED;
 - UNCONTAMINATED AIR CONDITIONING OR COMPRESSOR CONDENSATE;
 - UNCONTAMINATED GROUNDWATER OR SPRING WATER;
 - FOUNDATION OR FOOTER DRAIN-WATER WHERE FLOWS ARE NOT CONTAMINATED;
 - UNCONTAMINATED EXCAVATION DEWATERING (SEE REQUIREMENTS IN APPENDIX C(5) MAINE DEP 06-096 CHAPTER 500);
 - POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHINGS; AND
 - LANDSCAPE IRRIGATION.
- UNAUTHORIZED NON-STORMWATER DISCHARGES: THE DEPARTMENT'S APPROVAL UNDER THIS CHAPTER DOES NOT AUTHORIZE A DISCHARGE THAT IS MIXED WITH A SOURCE OF NON-STORMWATER, OTHER THAN THOSE DISCHARGES IN COMPLIANCE WITH APPENDIX C(5) MAINE DEP 06-096 CHAPTER 500. SPECIFICALLY, THE DEPARTMENT'S APPROVAL DOES NOT AUTHORIZE DISCHARGES OF THE FOLLOWING:
 - WASTEWATER FROM THE WASHOUT OR CLEANOUT OF CONCRETE, STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS OR OTHER CONSTRUCTION MATERIALS;
 - FUELS, OILS OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND HANDLING;
 - UNCONTAMINATED AIR CONDITIONING OR COMPRESSOR CONDENSATE;
 - UNCONTAMINATED GROUNDWATER OR SPRING WATER;
 - FOUNDATION OR FOOTER DRAIN-WATER WHERE FLOWS ARE NOT CONTAMINATED;
 - UNCONTAMINATED EXCAVATION DEWATERING (SEE REQUIREMENTS IN APPENDIX C(5) MAINE DEP 06-096 CHAPTER 500);
 - POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHINGS; AND
 - LANDSCAPE IRRIGATION.
- ADDITIONAL REQUIREMENTS: ADDITIONAL REQUIREMENTS MAY BE APPLIED ON A SITE-SPECIFIC BASIS.

CATCH BASIN RIM

2 STAKES PER BALE (TYP.)

HAY OR STRAW BALE LAID W/ WRAPPING STRING AS SHOWN

UNFINISHED GROUND

REMOVE BALES UPON COMPLETION OF PAVING &/OR SEEDING

LOW POINT SEDIMENT CONTROL BARRIER
N.T.S.

EROSION CONTROL DURING CONSTRUCTION

WINTER CONSTRUCTION

- WINTER CONSTRUCTION PERIOD: NOVEMBER 1 THROUGH APRIL 15
- OVERWINTER STABILIZATION OF DITCHES AND CHANNELS:
 - ALL STONE-UNITED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED BY NOVEMBER 15. ALL GRASS LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED BY SEPTEMBER 1. IF A DITCH OR CHANNEL IS NOT GRASS-LINED BY SEPTEMBER 1, THEN ONE OF THE FOLLOWING ACTIONS MUST BE TAKEN TO STABILIZE THE DITCH FOR LATE FALL AND WINTER.
 - INSTALL A SOD LINING IN THE DITCH:

A DITCH MUST BE LINED WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES: PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL, AND ANCHORING SOD AT THE BASE OF THE DITCH WITH LATE OR PLASTIC MESH TO PREVENT THE SOD FROM SLOUGHING DURING FLOW CONDITIONS. SEE THE PERMANENT VEGETATION BMP SECTION.
 - INSTALL A STONE LINING IN THE DITCH:

A DITCH MUST BE LINED WITH STONE RIPRAP BY NOVEMBER 15. A REGISTERED PROFESSIONAL ENGINEER MUST BE HIRED TO DETERMINE THE STONE SIZE AND LINING THICKNESS NEEDED TO WITHSTAND THE ANTICIPATED FLOW VELOCITIES AND FLOW DEPTHS WITHIN THE DITCH. IF NECESSARY, THE CONTRACTOR WILL REGRADE THE DITCH PRIOR TO PLACING THE STONE LINING SO TO PREVENT THE STONE LINING FROM REDUCING THE DITCH'S CROSS-SECTIONAL AREA.
- OVERWINTER STABILIZATION OF DISTURBED SLOPES:
 - ALL STONE-COVERED SLOPES MUST BE CONSTRUCTED AND STABILIZED BY NOVEMBER 15. ALL SLOPES TO BE VEGETATED MUST BE SEEDED AND MULCHED BY SEPTEMBER 1. THE DEPARTMENT WILL CONSIDER ANY AREA HAVING A GRADE GREATER THAN 3:1 TO BE A SLOPE. IF A SLOPE TO BE VEGETATED IS NOT STABILIZED BY SEPTEMBER 1, THEN ONE OF THE FOLLOWING ACTIONS MUST BE TAKEN TO STABILIZE THE SLOPE FOR LATE FALL AND WINTER. STABILIZE THE SLOPE WITH TEMPORARY VEGETATION AND EROSION CONTROL MATS BY OCTOBER 1. THE DISTURBED SLOPE MUST BE SEEDED WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET AND THEN INSTALL EROSION CONTROL MATS OR ANCHORED MULCH OVER THE SEEDING. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR FAILS TO COVER AT LEAST 75% OF THE SLOPE BY NOVEMBER 1, THEN THE CONTRACTOR WILL COVER THE SLOPE WITH A LAYER OF EROSION CONTROL MIX OR WITH STONE RIPRAP AS DESCRIBED IN THE FOLLOWING STANDARDS.
 - STABILIZE THE SOIL WITH SOD:

THE DISTURBED SLOPE MUST BE STABILIZED WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE CONTRACTOR PINNING THE SOD ONTO THE SLOPE WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL. THE CONTRACTOR WILL NOT USE LATE SEASON SOD INSTALLATION TO STABILIZE SLOPES HAVING A GRADE GREATER THAN 3:1 (3H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
 - STABILIZE THE SOIL WITH EROSION CONTROL MIX:

EROSION CONTROL MIX MUST BE PROPERLY INSTALLED BY NOVEMBER 15. THE CONTRACTOR WILL NOT USE EROSION CONTROL MIX TO STABILIZE SLOPES HAVING GREATER THAN 50% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE. SEE THE EROSION CONTROL MIX NOTES FOR ADDITIONAL CRITERIA.
 - STABILIZE THE SOIL WITH STONE RIPRAP:

PLACE A LAYER OF STONE RIPRAP ON THE SLOPE BY NOVEMBER 15. THE DEVELOPMENTS OWNER WILL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE NEEDED FOR STABILITY ON THE SLOPE AND TO DESIGN A FILTER LAYER FOR UNDERNEATH THE RIPRAP.
- OVERWINTER STABILIZATION OF DISTURBED SLOPES:
 - BY SEPTEMBER 15, ALL DISTURBED SLOPES ON AREAS HAVING A SLOPE LESS THAN 10% MUST BE SEEDED AND MULCHED. IF THE DISTURBED AREAS ARE NOT STABILIZED BY THIS DATE, THEN ONE OF THE FOLLOWING ACTIONS MUST BE TAKEN TO STABILIZE THE SOIL FOR LATE FALL AND WINTER.
 - STABILIZE THE SOIL WITH TEMPORARY VEGETATION:

SEED THE DISTURBED SOIL WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET, LIGHTLY MULCH THE SEEDS WITH HAY OR STRAW AT 75 POUNDS PER 1000 SQUARE FEET, AND ANCHOR THE MULCH WITH PEG AND TWINE (1 SQ. YD. BLOCK). MONITOR GROWTH OF THE RYE. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR FAILS TO COVER AT LEAST 80% OF THE DISTURBED SOIL BEFORE NOVEMBER 1, THEN MULCH THE AREA FOR OVER-WINTER PROTECTION AS DESCRIBED BELOW.
 - STABILIZE THE SOIL WITH SOD:

STABILIZE THE DISTURBED SOIL WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL.
 - STABILIZE THE SOIL WITH MULCH:

BY NOVEMBER 15, MULCH THE DISTURBED SOIL BY SPREADING HAY OR STRAW AT A RATE OF AT LEAST 150 POUNDS PER 1000 SQUARE FEET ON THE AREA SO THAT NO SOIL IS EXPOSED TO THE MULCH. IMMEDIATELY AFTER APPLYING THE MULCH, ANCHOR THE MULCH WITH PLASTIC NETTING TO PREVENT WIND FROM MOVING THE MULCH OFF THE DISTURBED SOIL. PROVIDE NETTING ON ALL SLOPES GREATER THAN 8%.
- MAINTENANCE:
 - IF AN INSPECTION DETERMINES THAT A CORRECTIVE ACTION IS REQUIRED, THE ACTION OR REPAIR SHALL BE STARTED BY THE END OF THE NEXT WORKDAY AND COMPLETED WITHIN SEVEN DAYS OR BEFORE THE NEXT STORM EVENT. MAINTENANCE WORK SHALL BE COMPLETED DURING THE ENTIRE CONSTRUCTION SEASON. ONCE A WEEK AND BEFORE AND AFTER EACH RAINFALL, SNOW STORM OR PERIOD OF THAWING AND RUNOFF, THE SITE CONTRACTOR SHALL CONDUCT VISUAL INSPECTIONS OF ALL EROSION CONTROL MEASURES AND PERFORM REPAIRS AS NEEDED TO INSURE THEIR CONTINUOUS FUNCTION. FOLLOWING THE TEMPORARY AND/OR FINAL SEEDING AND MULCHING, THE CONTRACTOR SHALL, IN THE SPRING, INSPECT AND REPAIR ANY DAMAGES AND/OR BARE SPOTS. AN ESTABLISHED VEGETATIVE COVER MEANS A MINIMUM OF 60 TO 80% OF AREAS VEGETATED WITH VIGOROUS GROWTH.

STABILIZATION SCHEDULE BEFORE WINTER:

DATE	ACTION
SEPTEMBER 15	ALL DISTURBED AREAS MUST BE SEEDED AND MULCHED. ALL SLOPES MUST BE STABILIZED, SEEDS AND MULCHED. ALL GRASS LINED DITCHES AND CHANNELS MUST BE STABILIZED WITH MULCH OR AN EROSION CONTROL BLANKET
OCTOBER 1	IF THE SLOPE IS STABILIZED WITH AN EROSION CONTROL BLANKET AND SEEDS. ALL DISTURBED AREAS TO BE PROTECTED WITH AN ANCHORED GRASS MUST BE SEEDS AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET AND MULCHED.
NOVEMBER 15	ALL STONE LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED. SLOPES THAT ARE COVERED WITH RIPRAP MUST BE CONSTRUCTED BY THAT DATE.

DURING WINTER CONSTRUCTION PERIOD ALL SNOW SHALL BE REMOVED FROM AREAS OF SEEDING AND MULCHING PRIOR TO PLACEMENT.

AREAS WITHIN 75 FEET OF STREAMS, WETLANDS, AND OTHER PROTECTED NATURAL RESOURCES THAT ARE NOT STABILIZED WITH VEGETATION BY DEC. 1 SHALL BE MULCHED AND ANCHORED WITH NETTING. IF WORK CONTINUES IN THIS AREA DURING THE WINTER, A DOUBLE LINE OF SEDIMENT BARRIERS MUST BE USED.

HOUSEKEEPING

- SPILL PREVENTION: CONTROLS MUST BE USED TO PREVENT POLLUTANTS FROM BEING DISCHARGED FROM MATERIALS ON SITE, INCLUDING STORAGE PRACTICES TO MINIMIZE EXPOSURE OF THE MATERIALS TO STORMWATER, AND APPROPRIATE SPILL PREVENTION, CONTAINMENT, AND RESPONSE PLANNING AND IMPLEMENTATION.
- GROUNDWATER PROTECTION: DURING CONSTRUCTION, LIQUID PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS WITH THE POTENTIAL TO CONTAMINATE GROUNDWATER MAY NOT BE STORED OR HANDLED IN AREAS OF THE SITE DRAWING TO AN INFILTRATION AREA. AN "INFILTRATION AREA" IS ANY AREA OF THE SITE THAT BY DESIGN OR AS A RESULT OF SOILS, TOPOGRAPHY, AND OTHER RELEVANT FACTORS ACCUMULATES RUNOFF THAT INFILTRATES INTO THE GROUND. DURING CONSTRUCTION, AND OTHER FORMS OF SECONDARY CONTAMINATION THAT PREVENT DISCHARGE TO GROUNDWATER MAY BE USED TO ISOLATE PORTIONS OF THE SITE FOR THE PURPOSES OF STORAGE AND HANDLING OF THESE MATERIALS.
- EROSION CONTROL: EROSION CONTROL MEASURES MUST BE TAKEN TO ENSURE THAT ACTIVITIES DO NOT RESULT IN NOTICEABLE EROSION OF SOILS OR FUGITIVE DUST EMISSIONS DURING OR AFTER CONSTRUCTION. ON MY NOT BE USED FOR DUST CONTROL, ANY OFFSITE TRACKING OF MUD OR SEDIMENT SHALL BE VACUUMED IMMEDIATELY AND PRIOR TO THE NEXT SIGNIFICANT STORM EVENT.
- DEBRIS AND OTHER MATERIALS: LITTER, CONSTRUCTION DEBRIS, AND CHEMICALS EXPOSED TO STORMWATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.
- TRENCH OR FOUNDATION DE-WATERING: TRENCH DE-WATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, COFFER DAMS, PONDS, AND OTHER AREAS WITHIN THE CONSTRUCTION AREA THAT RETAIN WATER AFTER EXCAVATION. IN MOST CASES, THE COLLECTED WATER IS HEAVILY SILTED AND HINDERS CORRECT SAFE CONSTRUCTION PRACTICES. THE COLLECTED WATER MUST BE REMOVED FROM THE PONDED AREA, EITHER THROUGH GRAVITY OR PUMPING, AND MUST BE SPREAD THROUGH NATURAL WOODED BUFFERS OR REMOVED TO AREAS THAT ARE SPECIFICALLY DESIGNED TO COLLECT THE MAXIMUM AMOUNT OF SEDIMENT POSSIBLE. USE A COFFERDAM SEDIMENTATION BASIN AVOID ALLOWING THE WATER TO FLOW OVER DISTURBED AREAS OF THE SITE. EQUIVALENT MEASURES MAY BE TAKEN IF APPROVED BY THE DEPARTMENT.
- NON-STORMWATER DISCHARGES: IDENTIFY AND PREVENT CONTAMINATION BY NON-STORMWATER DISCHARGES, WHERE ALLOWED NON-STORMWATER DISCHARGES EXIST, THEY MUST BE IDENTIFIED AND STEPS SHOULD BE TAKEN TO ENSURE THE IMPLEMENTATION OF APPROPRIATE POLLUTION PREVENTION MEASURES FOR THE NON-STORMWATER COMPONENTS) OF THE DISCHARGE. AUTHORIZED NON-STORMWATER DISCHARGES ARE:
 - DISCHARGES FROM FIREFIGHTING ACTIVITY;
 - FIRE HYDRANT FLUSHINGS;
 - VEHICLE WASHWATER IF DETERGENTS ARE NOT USED AND WASHING IS LIMITED TO THE EXTERIOR OF VEHICLES (ENGINE, UNDERCARRIAGE AND TRANSMISSION WASHING IS PROHIBITED);
 - DUST CONTROL RUNOFF IN ACCORDANCE WITH PERMIT CONDITIONS AND APPENDIX C(3) OF MAINE DEP 06-096 CHAPTER 500;
 - ROUTINE EXTERNAL BUILDING WASHDOWN, NOT INCLUDING SURFACE PAINT REMOVAL, THAT DOES NOT INVOLVE DETERGENTS;
 - PAVEMENT WASHWATER (WHERE SPILLS/LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAVE NOT OCCURRED, UNLESS ALL SPILLED MATERIAL HAD BEEN REMOVED) IF DETERGENTS ARE NOT USED;
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 - WASTEWATER FROM THE WASHOUT OR CLEANOUT OF CONCRETE, STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS OR OTHER CONSTRUCTION MATERIALS;
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UNFINISHED GROUND

REMOVE BALES UPON COMPLETION OF PAVING &/OR SEEDING

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WINTER CONSTRUCTION

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 - INSTALL A SOD LINING IN THE DITCH:

A DITCH MUST BE LINED WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES: PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL, AND ANCHORING SOD AT THE BASE OF THE DITCH WITH LATE OR PLASTIC MESH TO PREVENT THE SOD FROM SLOUGHING DURING FLOW CONDITIONS. SEE THE PERMANENT VEGETATION BMP SECTION.
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 - STABILIZE THE SOIL WITH SOD:

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 - STABILIZE THE SOIL WITH EROSION CONTROL MIX:

EROSION CONTROL MIX MUST BE PROPERLY INSTALLED BY NOVEMBER 15. THE CONTRACTOR WILL NOT USE EROSION CONTROL MIX TO STABILIZE SLOPES HAVING GREATER THAN 50% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE. SEE THE EROSION CONTROL MIX NOTES FOR ADDITIONAL CRITERIA.
 - STABILIZE THE SOIL WITH STONE RIPRAP:

PLACE A LAYER OF STONE RIPRAP ON THE SLOPE BY NOVEMBER 15. THE DEVELOPMENTS OWNER WILL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE NEEDED FOR STABILITY ON THE SLOPE AND TO DESIGN A FILTER LAYER FOR UNDERNEATH THE RIPRAP.
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 - BY SEPTEMBER 15, ALL DISTURBED SLOPES ON AREAS HAVING A SLOPE LESS THAN 10% MUST BE SEEDED AND MULCHED. IF THE DISTURBED AREAS ARE NOT STABILIZED BY THIS DATE, THEN ONE OF THE FOLLOWING ACTIONS MUST BE TAKEN TO STABILIZE THE SOIL FOR LATE FALL AND WINTER.
 - STABILIZE THE SOIL WITH TEMPORARY VEGETATION:

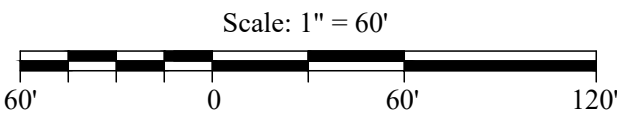
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 - STABILIZE THE SOIL WITH MULCH:



SYMBOL	DESCRIPTION
	POND
	DRAINAGE SUB AREA
	REACH
	DRAINAGE AREA BOUNDARY
	TIME OF CONCENTRATION ROUTE
	LIMIT OF WETLANDS
	EXISTING CONTOUR
	PROPOSED CONTOUR

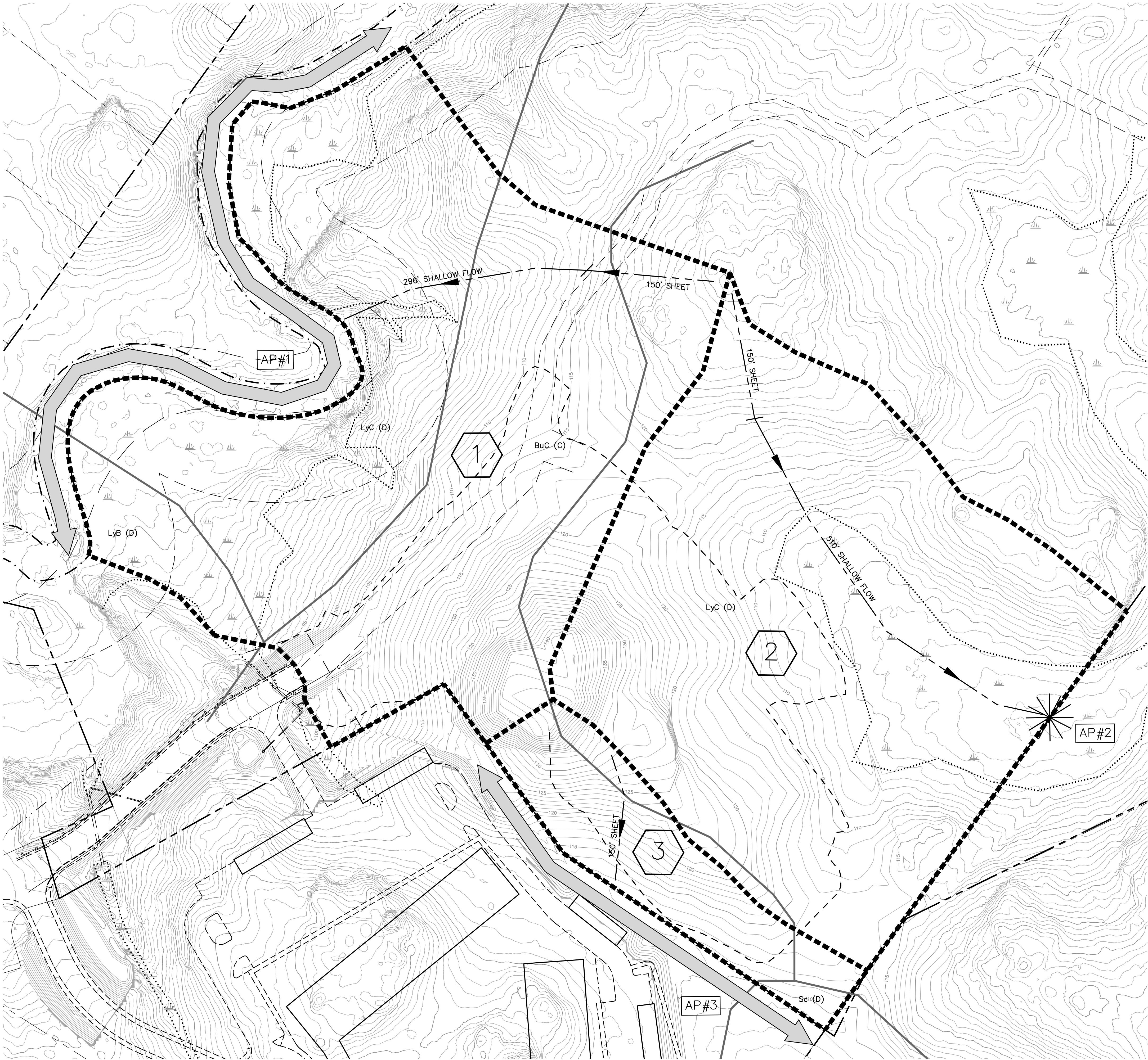
ANALYSIS POINT	PRE DEVELOPMENT FLOWS		
	2 YR. STORM	10 YR. STORM	25 YR. STORM
AP-1	7.20 CFS	15.25 CFS	22.36 CFS
AP-2	6.10 CFS	12.15 CFS	17.39 CFS
AP-3	1.00 CFS	2.23 CFS	3.32 CFS



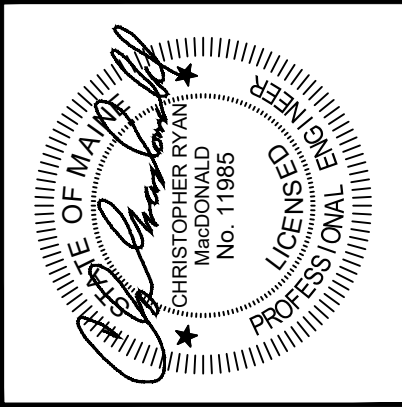
SOIL DESIGNATION	
	SLOPE DESIGNATION
	HYDROLOGIC SOIL GROUP
	HYDROLOGIC SOIL

SOILS LEGEND	
SYMBOL	DESCRIPTION
	SOIL BOUNDARY LINES
	LIMIT OF WETLANDS

HYDROLOGIC SOIL GROUP	
SOIL	GROUP
BUXTON (BuC)	C
LYMAN-ROCK (LyB)	D
LYMAN-ROCK (Lyc)	D
SCANTIC (Sc)	D



NO.	DATE	REVISION DESCRIPTION
1	5/15/24	Submitted for Preliminary Permit Application
2	7/17/24	Submitted for Final Permit Application



**BH2M**

Berry, Huff, MacDonald, Milligan Inc.
Engineers, Surveyors

380B Main Street
Gorham, Maine 04038

Tel: (207) 839-2771
www.bh2m.com

FOR

Avesta Housing
307 Cumberland Avenue
Portland, ME 04101

PRE-DEVELOPMENT
PLAN

AVESTA HOUSING PROJECT

BARRA ROAD
BIDDEFORD, MAINE

DESIGNED B. Monsen	DATE April 2024
DRAWN Dept.	SCALE 1" = 60'
CHECKED C. MacDonald	JOB. NO. 24017

SHEET

A

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Tc SUMMARY
(FOR THOSE NOT LABELED ON THE PLAN)
SUBCATCHMENT Tc ROUTE

SA-1I	150' SHEET, 45' SHALLOW, 112' CHANNEL
SA-1J	150' SHEET, 73' SHALLOW
SA-2D	150' SHEET, 12' SHALLOW, 61' CHANNEL
SA-3	108' SHEET
SA-3O	143' SHEET, 54' CHANNEL

NOTE: SA-1A THROUGH SA-1H & SA-1-K & SA-2A THROUGH SA-2C & SA-3A THROUGH SA-3M HAVE TC PATHS LESS THAN 0.1 HOURS (6 MIN.), THE TR-55 LIMITATION ON MIN. TC, AND ARE ASSUMED AS 6 MIN.

LEGEND

SYMBOL	DESCRIPTION
	POND
	DRAINAGE SUB AREA
	REACH
	DRAINAGE AREA BOUNDARY
	TIME OF CONCENTRATION ROUTE
	LIMIT OF WETLANDS
	EXISTING CONTOUR
	PROPOSED CONTOUR

POST (PRE) DEVELOPMENT FLOWS

ANALYSIS POINT	2 YR. STORM	10 YR. STORM	25 YR. STORM
AP-1	7.34 (7.20) CFS	15.28 (15.25) CFS	22.08 (22.36) CFS
AP-2	5.65 (6.10) CFS	11.45 (12.15) CFS	16.57 (17.39) CFS
AP-3	0.61 (1.00) CFS	1.35 (2.23) CFS	2.02 (3.32) CFS

Scale: 1" = 60'

SOIL DESIGNATION

SLOPE DESIGNATION
A-B(A)

HYDROLOGIC SOIL GROUP
HYDROLOGIC SOIL

SOILS LEGEND

SYMBOL	DESCRIPTION
	SOIL BOUNDARY LINES
	LIMIT OF WETLANDS

HYDROLOGIC SOIL GROUP

SOIL	GROUP
BUXTON (BuC)	C
LYMAN-ROCK (LyB)	D
LYMAN-ROCK (LyC)	D
SCANTIC (Sc)	D

DESIGNED B. Monsen	DATE April 2024
DRAWN Dept.	SCALE 1" = 60'
CHECKED C. MacDonald	JOB. NO. 24017

SHEET

B

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POST-DEVELOPMENT
PLAN

AVESTA HOUSING PROJECT

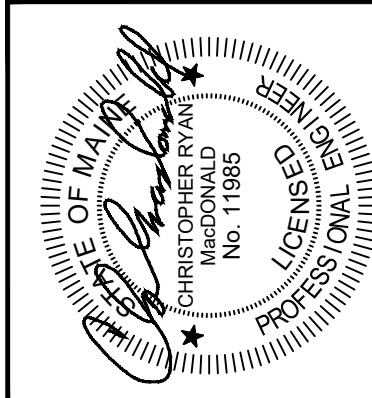
BARRA ROAD
BIDDEFORD, MAINE

FOR
Avesta Housing
307 Cumberland Avenue
Portland, ME 04101

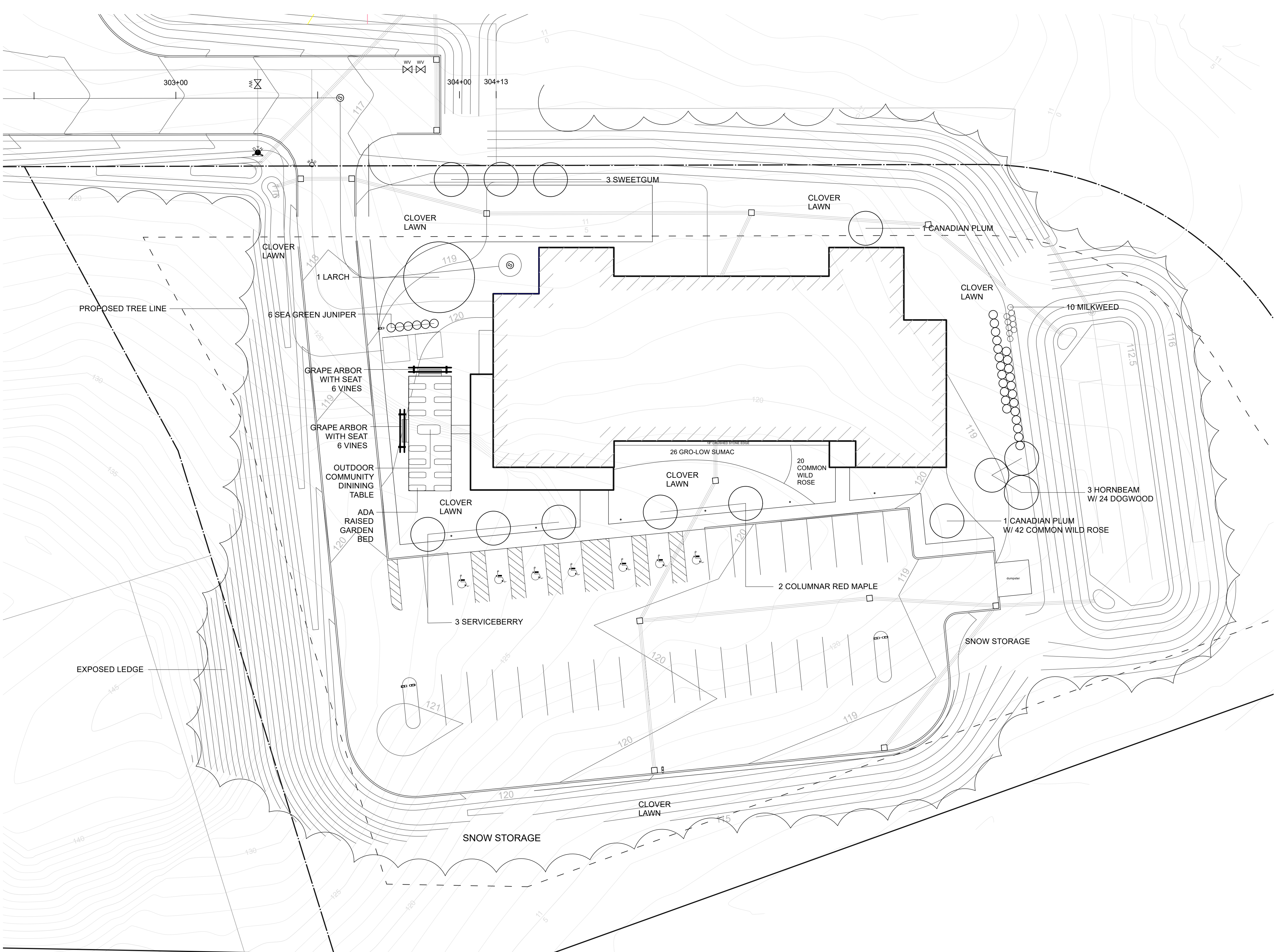
BH2M

Berry, Huff, MacDonald, Milligan Inc.
Engineers, Surveyors

380B Main Street
Gorham, Maine 04038
Tel: (207) 839-2771
www.bh2m.com



NO.	DATE	REVISION DESCRIPTION
1	5/15/24	Submitted for Preliminary Permit Application
2	7/17/24	Submitted for Final Permit Application



PLANTING SPECIFICATION

- A. Call Dig Safe prior to any excavation work. The location and maintenance of trees and landscaping cannot conflict with site utilities. Coordinate with other project drawings.
- B. In any case where drawings or specifications vary from the City of Biddeford standards, City regulations take precedent. Report any discrepancies to Owner and Landscape Architect
- C. The location of all trees and shrubs shall be staked and approved by the Landscape Architect prior to planting.
- D. Flag the northern side of trees in the nursery and install trees oriented to the north. Landscape Architect to select plant material with contractor.
- E. All plant material shall be healthy and full-branching, true to form and specified size, free of disease, pests and physical damage.
- F. Employ only experienced personnel familiar with required work.
- G. If deciduous trees are planted in - leaf, they shall be sprayed with an anti-desiccant prior to digging operation.
- H. Landscape installation timeframe:
- Balled and Burlapped:
Spring 4/1 to 7/15, and Fall 8/15 to 10/15

- I. Specified plant material may be substituted by the use of alternate, similar plant material, with approval from the Landscape Architect.
- J. All plant material and lawn shall be guaranteed for a period for two years from date of occupancy. All dead and non-vigorous material shall be replaced, without cost to the Owner, with a similar species, and these replacement plants shall be guaranteed for one year from the date of acceptance by the Owner.
- K. Planting soil shall be 2/3 topsoil, free of debris and stones over 1" in diameter, and 1/3 peat moss. The pH shall be between 5.5 - 7.0. Ground limestone shall be added to the planting soil to achieve specified pH.
- L. Add compost in planting beds at a 1 part compost to 4 part existing soil ratio, tilled to a 12" depth per industry standards.
- M. Fertilizer shall be applied when planting pits are 2/3 full of planting soil with a 5-10-10 fertilizer. After planting, slow release fertilizer, minimum 5 year, shall be applied using a 4 oz. packet system at rates recommended by the manufacturer. See U below.
- N. Mulch shall be 100% fine shredded pine bark, 2" deep. Planting beds adjacent to buildings shall use 3/4" aggregate or less. Landscape and Owner to approve color.
- O. Tree wrap shall be Osnaburg Cloth, 4 7/8" wide, unbleached, or approved equal. Cloth should only be used for material transport and installation and removed immediately following installation.
- P. Trees normally do not need to be staked and staking can be harmful to the tree and a hazard in pedestrian locations. Staking should only be done with the approval of the Landscape Architect and the Westbrook City Arborist if it is expected that the tree will not be able to support itself. The following are reasons why trees do not remain straight:
- Root balls placed on soft soil. Tamp soils under root ball prior to planting
- Root balls with very sandy soil or very wet clay soil. Staking advisable
- Trees located in a place of extremely windy conditions. Staking advisable
- Trees located in a place where vandalism may impact tree: Staking advisable
- Q. If tree stakes are required they shall be placed parallel to the curb. Trees will be secured with web strapping or polyester chain-lock. No wire or hose will be used. Assure that the bearing surface of the webbed strapping or poly chain lock against the trunk is a minimum of 12 MM (0.5 inches). Remove all staking as soon as the tree has grown sufficient roots to overcome the problem that required the tree to be staked. Stakes shall be in place no longer than one year or at least until the end of the growing season after planting.
- R. Install black, molded, modular panels manufactured with 50 percent recycled polyethylene plastic with ultraviolet inhibitors. 85 mils (2.2 mm) thick, with vertical root deflecting ribs protruding 1/2 inch (12 mm) to 3/4 inch (19 mm) out from panel, and each panel 24 inches (610 mm) wide by 18 inches in depth. Integrated zipper joining system for panel-to-panel connection.
- S. Planting Pits and Trenches: Excavate circular planting pits with tapered sides. Excavations with vertical sides are not acceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit sheared or smoothed during excavation. Excavate two times as wide as ball diameter. Excavate at least 12 inches (300 mm) wider than root spread and deep enough to accommodate vertical roots for bare-root stock. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball. Subsoil and topsoil removed from excavations may not be used as planting media

T. Maintenance shall begin immediately after each plant is planted and shall continue until established:

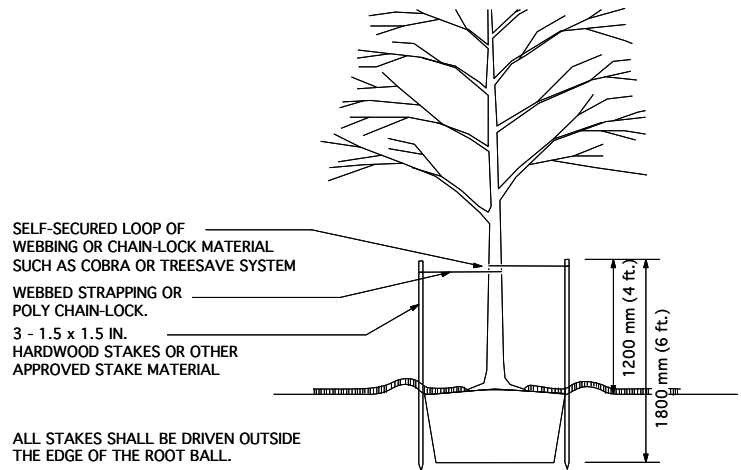
Maintenance required:

- Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring water saucers, resetting to proper grade or vertical position, and performing other operations as required to establish healthy, viable plantings.
- Planting areas shall be kept free of weeds, grass, and other undesired vegetative growth.
- Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of settling. Do not place mulch within 3 inches (75 mm) of trunks or stems. A continuous, linear mulched area shall be maintained between closely spaced plants to avoid grassed strips less than 2 feet (600 mm) wide or scallops of grass that are difficult to maintain.
- Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use practices to minimize the use of chemicals and pesticides and reduce hazards.
- Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
- Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings without additional cost to the Owner.
- Prune, thin, and shape woody materials according to standard professional horticultural and arboricultural practices and in accordance with ANSI A300 (Part 3) Pruning Standards. Unless otherwise indicated by Landscape Architect, do not cut tree leaders, remove only injured, dying, or dead branches from trees and shrubs. Prune to retain natural character.
- Pruning shall be done with clean, sharp tools. Cuts shall be made at branch collars, leaving no stubs. No tree paint shall be used.

U. General Fertilizers and Pesticides Note: Utilize organic fertilizers, pesticides, or biological controls or substitute with OMRI approved materials. Obtain permission and notify Owner prior to substitutions and applications.

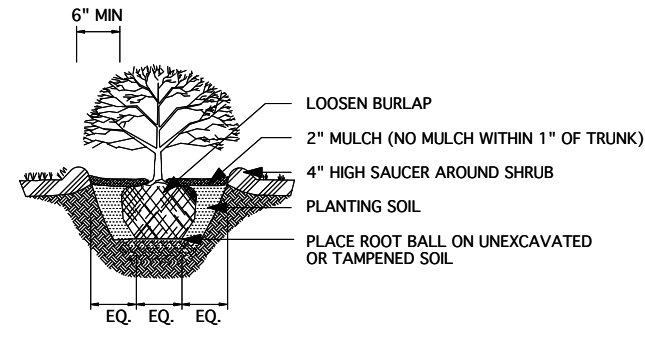
QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
2	Acer rubrum	Red Maple Armstrong Gold	3" Clip.	BB / Columnar
3	Amelanchier canadensis	Canadian Serviceberry	7' Ht.	BB
10	Asclepias syriaca	Common Milkweed	1 Gallon	
2	Carpinus betulus fastigiata	Hornbeam	3" Clip.	BB / Columnar
24	Cornus sericea	Red Twig Dogwood	2 Gallon	
6	Juniperus chinensis	Sea Green Juniper	#5	
1	Larix decidua	Larch	3" Clip.	BB
3	Liquidambar styraciflua	Sweetgum Slender Silhouette	3" Clip.	BB / Columnar
62	Rosa virginiana	Common Wild Rose	1 Gallon	
26	Rhus aromatica	Gro-Low Fragrant Sumac	1 Gallon	
2	Prunus nigra	Canadian Plum	7' Ht.	BB
12	Vitis labrusca, V. riparia	Wild Grape	#5	

Lawn Note: "Clover Lawn Mix" by OPN Seed or similar approved by Landscape Architect. Install and maintain per manufacturer and industry standards for clover mix lawns.



TYPICAL TREE PLANTING DETAIL

N.T.S.



TYPICAL SHRUB/VINE PLANTING DETAIL

N.T.S.

GENERAL NOTES:

- CALL DIGSAFE PRIOR TO SITE WORK: 888-344-7233
- BASE INFORMATION FROM OWNER.
- REFER TO CIVIL AND ARCHITECTURAL DRAWINGS FOR SITE LAYOUT AND GRADING.
- REFERENCE CIVIL DRAWINGS FOR GRADING, UTILITY, STORMWATER, AND OTHER SITE DETAILS. COORDINATE ALL LANDSCAPE WITH CIVIL AND ARCHITECTURE DRAWINGS
- SEE PHOTOMETRIC PLAN FOR LIGHTING DETAILS
- EROSION CONTROL MEASURES PER CIVIL DRAWINGS
- ALL PLANTING SOILS TO MEET UMO EXTENSION SPECIFICATIONS

Project:

Avesta Housing Project

Barra Road
Biddeford, ME 04092

Owners:

Avesta Housing
307 Cumberland Ave
Portland, ME 04101

Architect:

Lassel Architects
South Berwick, ME

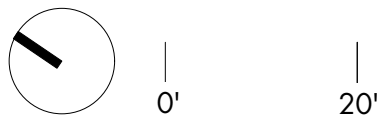
Civil Engineer:

BH2M
Gorham, ME

Landscape Architect:

_rasor

87 Main Street
Yarmouth, ME 04096
207-319-1606
hello@rasor.co



1" = 20'



M. Rasor

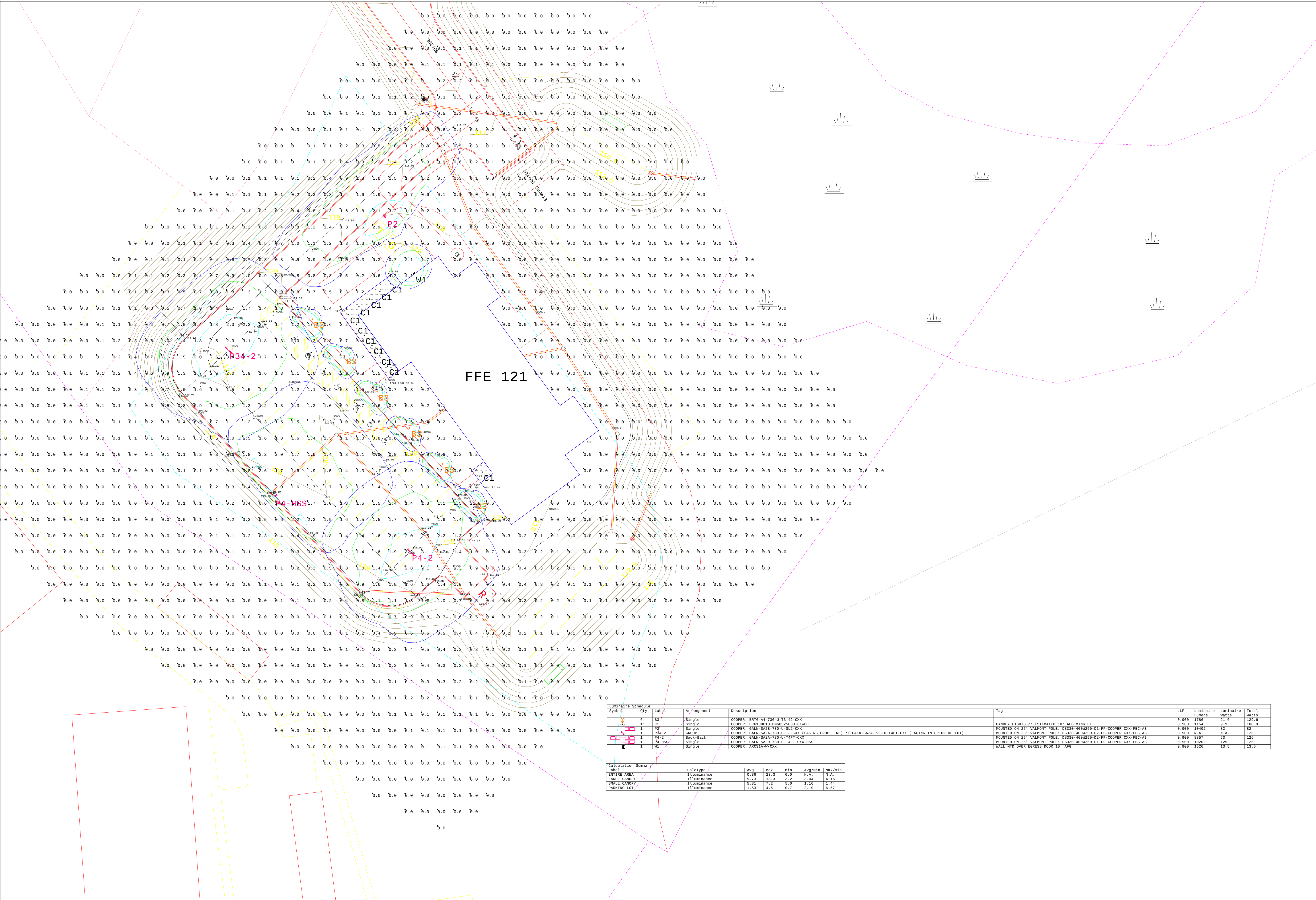
Landscape Plan

for permitting

3	Added Milkweed	6.5.24
2	Additional Plantings	6.2.24
1	Planning Board	5.15.24
No.	Revision / Issue	Date

Design: MR	Checked: MR
Drawn: MR	Approved: MR
Project:	2024.13

L-1



Luminaire Schedule				Description	Tag	LLF	Luminaire Lumens	Luminaire Watts	Total Watts
Symbol	Qty	Label	Arrangement						
○	6	B3	Single	COOPER: BRT6-A4-730-U-T3-42-CXX			0.980	1786	129.6
○	11	C1	Single	COOPER: HCS1000U-08062550-51MMH	CANOPY LIGHTS // ESTIMATED 10' AFG WING HT		0.980	1154	180.9
□	1	P2	Single	COOPER: GALN-SAG6-730-U-SL2-CXX	MOUNTED ON 25' VALMONT POLE: DS330-4806255-D1-PP-COOPER CXX-FBC-AB		0.980	16482	82
□	1	P24-2	GROUP	COOPER: GALN-SAG2-730-U-T3-CXX (FACING PROP LINE) // GALN-SAG2-730-U-TAFT-CXX (FACING INTERIOR OF LOT)	MOUNTED ON 25' VALMONT POLE: DS330-4806255-D1-PP-COOPER CXX-FBC-AB		0.980	N.A.	126
□	1	P4-2	Back-Back	COOPER: GALN-SAG2-730-U-TAFT-CXX	MOUNTED ON 25' VALMONT POLE: DS330-4806255-D2-PP-COOPER CXX-FBC-AB		0.980	8357	63
□	1	P4-HSS	Single	COOPER: GALN-SAG2-730-U-TAFT-CXX-HSS	MOUNTED ON 25' VALMONT POLE: DS330-4806255-D1-PP-COOPER CXX-FBC-AB		0.980	16262	125
□	1	M1	Single	COOPER: AKCSIA-W-CXX	WALL MTD OVER EGRESS DOOR 18' AFG		0.980	1526	13.5

Calculation Summary						
Label	CalcType	Avg	Max	Min	Avg/Min	Max/Min
ENTIRE AREA	Footcandle	6.38	23.3	0.0	N.A.	N.A.
LARGE CANOPY	Footcandle	9.73	13.3	3.2	3.04	4.16
SMALL CANOPY	Footcandle	5.01	7.2	5.0	1.16	1.44
PARKING LOT	Footcandle	1.53	4.4	0.7	2.19	6.57



Revisions				
#	Date	Comments		

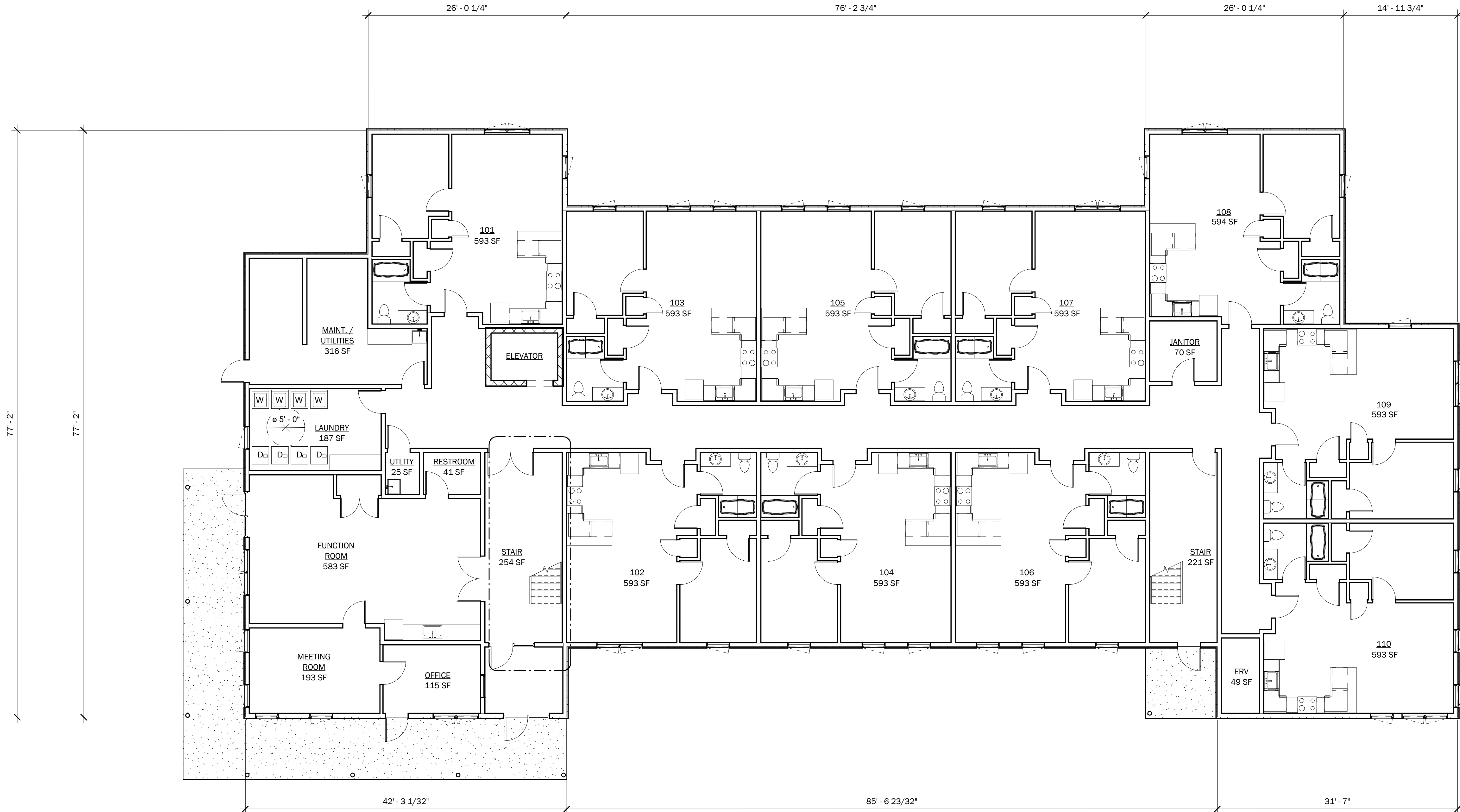
Drawn By: Michael O'Brien
Checked By:
Date: 5/9/2024
Contact: mobrien@charroninc.com
Scale: NTS

AVESTA BARRA ROAD COOPER OPTION
BIDDEFORD, ME



LASSEL
ARCHITECTS

370 MAIN STREET
SOUTH BERWICK, ME 03908
207 384 2049
lasselarchitects.com



① FIRST FLOOR PLAN
1/8" = 1'-0"

CLIENT:
AVESTA

PROJECT:
BARRA ROAD

DRAFT

PROJECT NUMBER: 24.03
DATE: MAY 2024
SCALE: AS NOTED
REVISION:

DRAWING NAME:
FIRST FLOOR PLAN

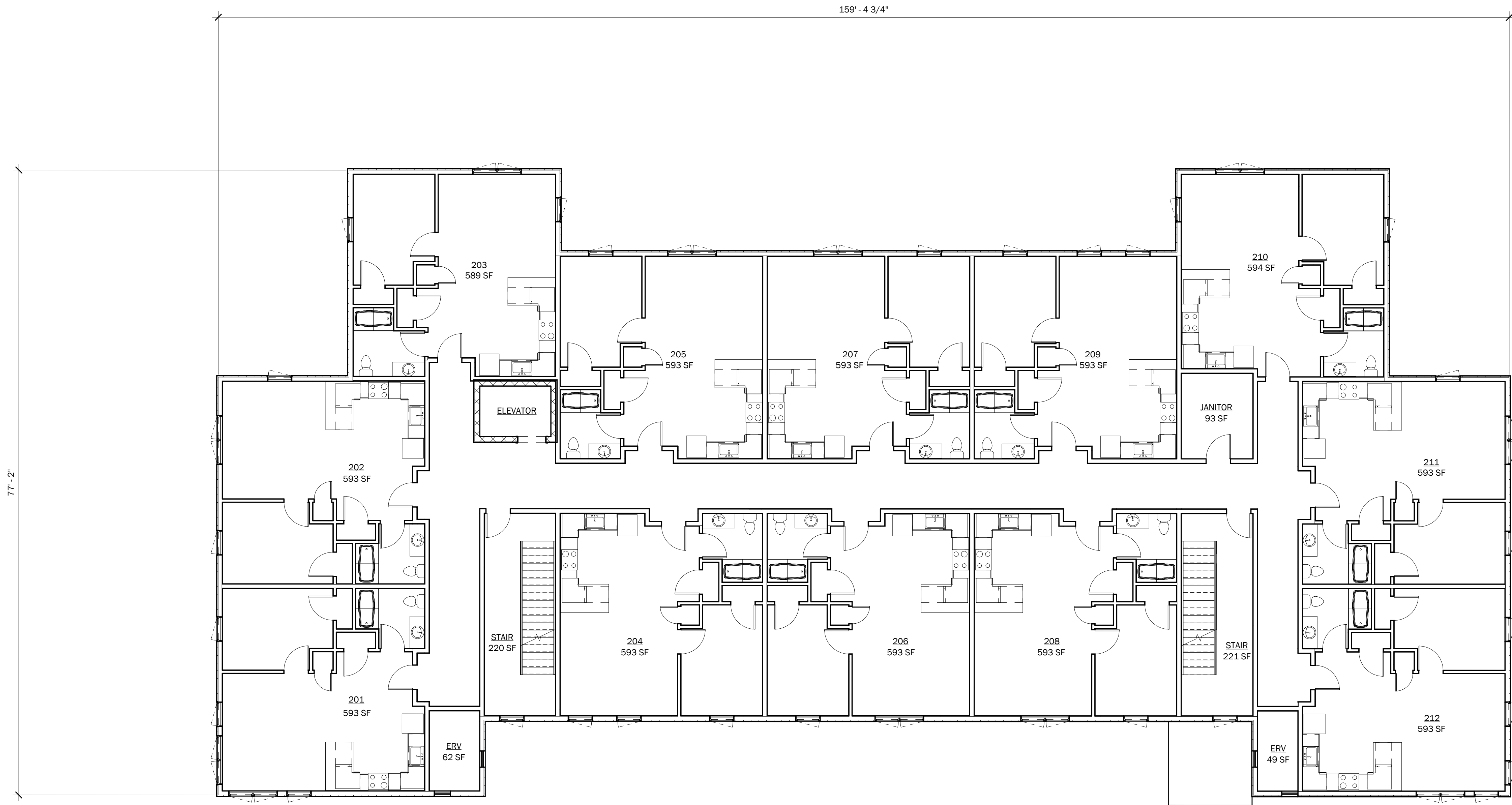
DRAWING NUMBER:

SD - 01



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SOUTH BERWICK, ME 03908
207 384 2049
lasselarchitects.com



① SECOND FLOOR PLAN
1/8" = 1'-0"

CLIENT:

AVESTA

PROJECT:

BARRA ROAD

PROJECT NUMBER:

24.03

DATE:

MAY 2024

SCALE:

AS NOTED

REVISION:

DRAWING NAME:

SECOND FLOOR PLAN

DRAWING NUMBER:

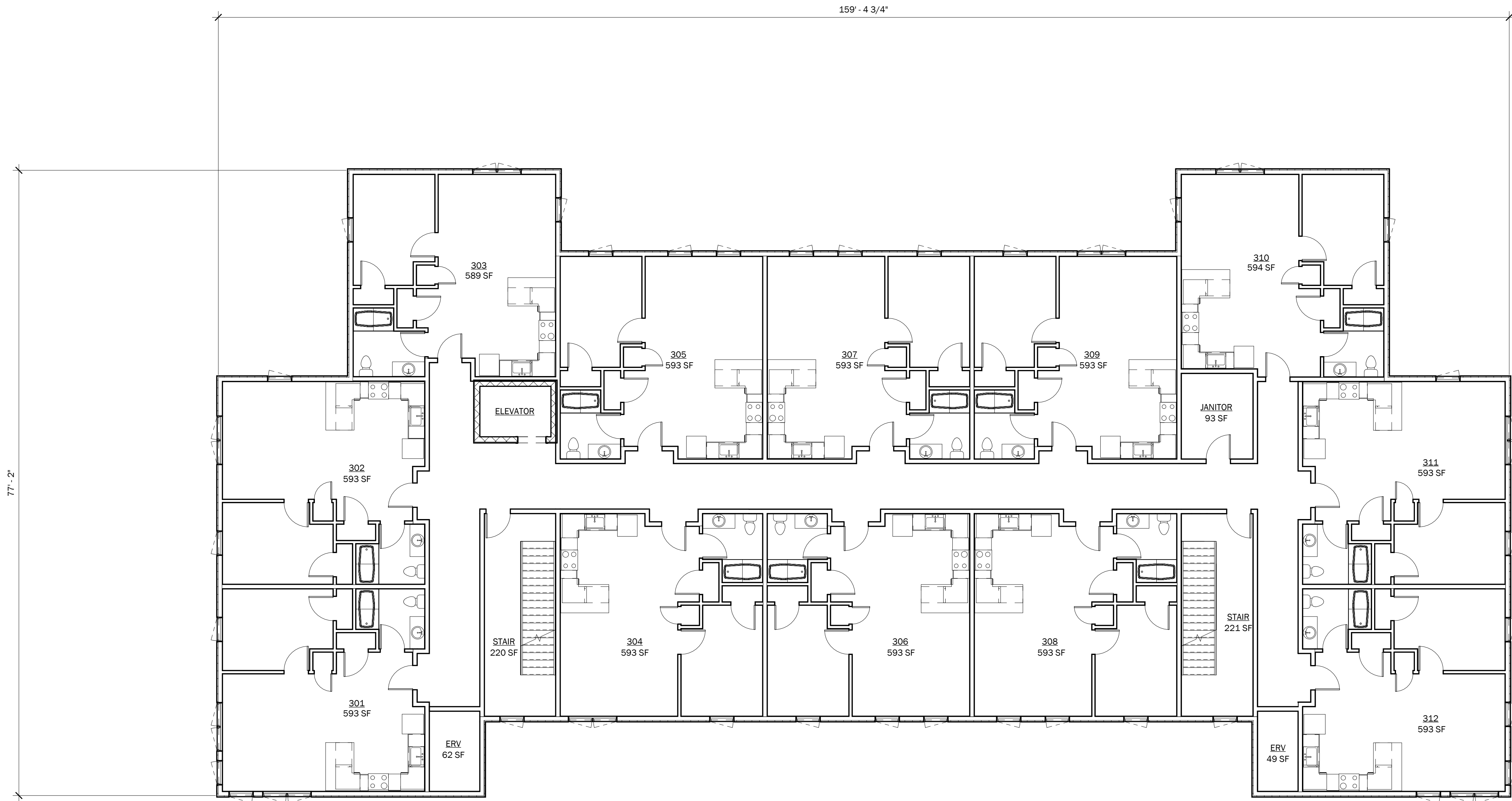
SD - 02

DRAFT



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ARCHITECTS

370 MAIN STREET
SOUTH BERWICK, ME 03908
207 384 2049
lasselarchitects.com



① THIRD FLOOR PLAN
1/8" = 1'-0"

CLIENT:

AVESTA

PROJECT:

BARRA ROAD

PROJECT NUMBER:

24.03

DATE:

MAY 2024

SCALE:

AS NOTED

REVISION:

DRAWING NAME:

THIRD FLOOR PLAN

DRAWING NUMBER:

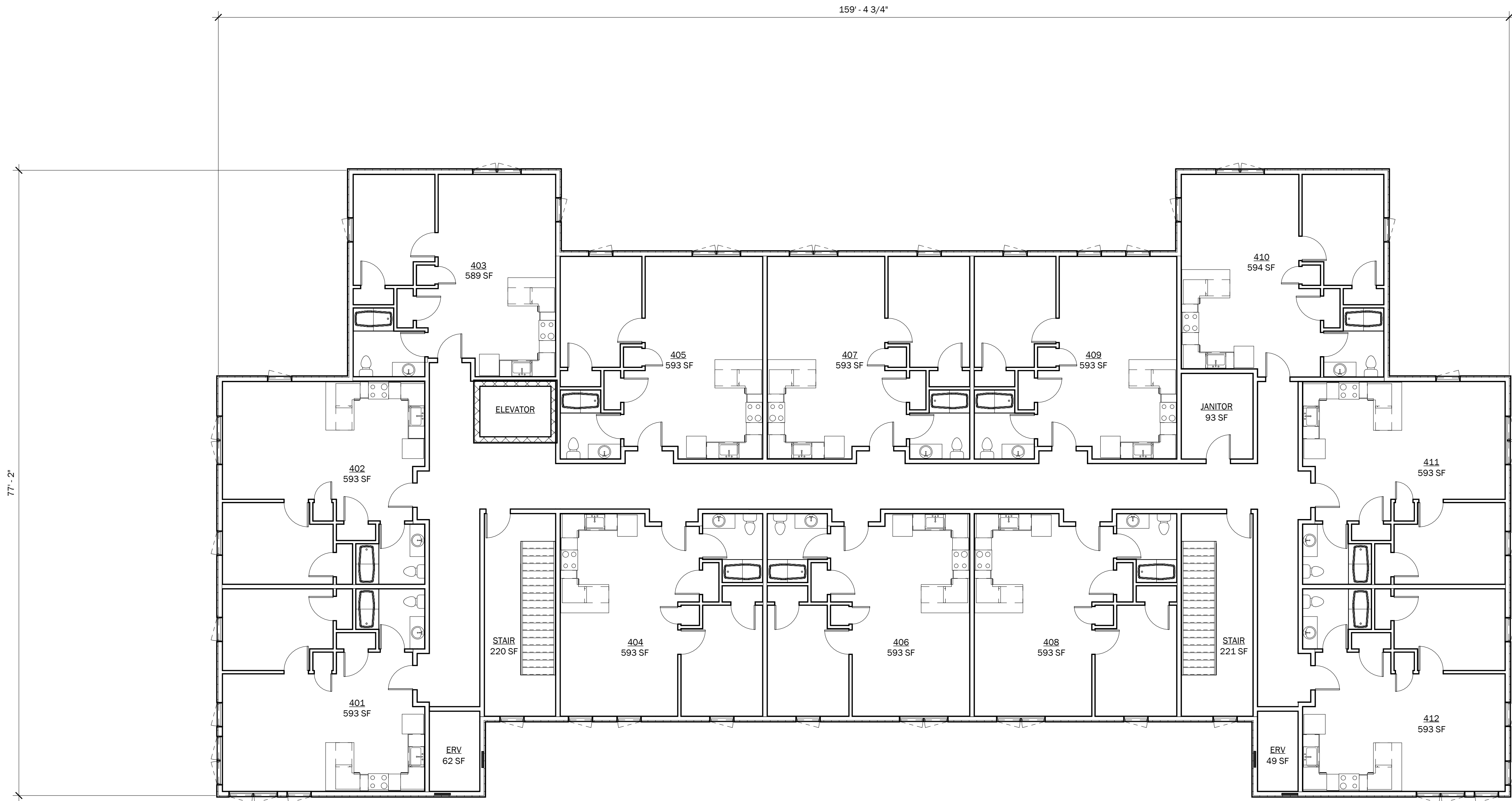
SD - 03

DRAFT



LASSEL
ARCHITECTS

370 MAIN STREET
SOUTH BERWICK, ME 03908
207 384 2049
lasselarchitects.com



① FOURTH FLOOR PLAN
1/8" = 1'-0"

CLIENT:
AVESTA

PROJECT:
BARRA ROAD

DRAFT

PROJECT NUMBER: 24.03
DATE: MAY 2024
SCALE: AS NOTED
REVISION:

DRAWING NAME:
FOURTH FLOOR PLAN

DRAWING NUMBER:

SD - 04



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ARCHITECTS

370 MAIN STREET
SOUTH BERWICK, ME 03908
207 384 2049
lasselarchitects.com



CLIENT:

AVESTA

PROJECT:

BARRA ROAD

PROJECT NUMBER:

24.03

DATE:

MAY 2024

SCALE:

AS NOTED

REVISION:

DRAWING NAME:

EXTERIOR ELEVATIONS

DRAWING NUMBER:

SD - 05

DRAFT



① PERSPECTIVE 1



③ AXON 1



② PERSPECTIVE 2



④ AXON 2



LASSEL
ARCHITECTS

370 MAIN STREET
SOUTH BERWICK, ME 03908
207 384 2049
lasselarchitects.com

CLIENT:

AVESTA

PROJECT:

BARRA ROAD

PROJECT NUMBER:

24.03

DATE:

MAY 2024

SCALE:

AS NOTED

REVISION:

DRAWING NAME:

3D VIEWS

DRAWING NUMBER:

SD - 06

DRAFT

5/6/2024 10:33:45 AM \\Server\\data\\FILES CURRENT\\24.03 Avesta Barra Road - Bidderford\\8. DRAWINGS\\8.2 REVIT\\BIDDEFORD - AVESTA BARRA - SD-02 - NO FIRST FLOOR NOTCH.rvt

CLIENT:

AVESTA

PROJECT:

BARRA ROAD

PROJECT NUMBER:

24.03

DATE:

MAY 2024

SCALE:

AS NOTED

REVISION:

DRAWING NAME:

PROPOSED MATERIALS

DRAWING NUMBER:

SD - 07

① EAST ELEVATION
3/8" = 1'-0"

ROOF
174' - 0"

FOURTH FLOOR
163' - 0"

THIRD FLOOR
152' - 0"

SECOND FLOOR
141' - 0"

FIRST FLOOR
130' - 0"

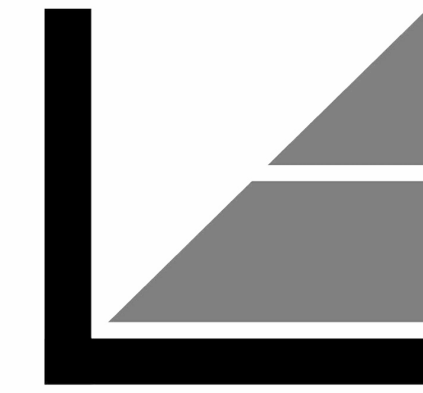
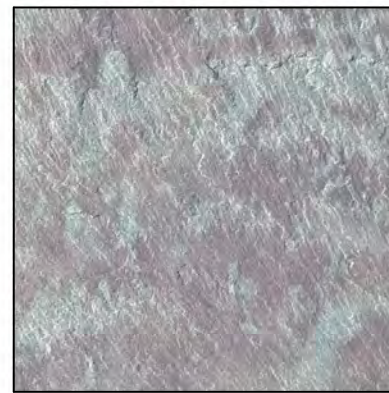
5" CLAPBOARD SIDING / SPRUCE

7" BOARD & BATTEN / HERRINGBONE

7" BOARD & BATTEN / SLATE

VINYL SHINGLES / NATURAL BLEND

TILE / BLUE-GRAY



LASSEL
ARCHITECTS

370 MAIN STREET
SOUTH BERWICK, ME 03908
207 384 2049
lasselarchitects.com

CITY OF BIDDEFORD - SITE PLAN APPLICATION DRAWING CHECKLIST

LAST REVISED: 04/18/23

CHECKLIST DIRECTIONS:

1. The following checklist must be completely filled out by the applicant for any Site Plan submittal to the Planning Department.
2. Applicant to confirm all of the items listed are included within the submittal. Any missing items must have adequate reasoning to justify their absence.
3. City to review applicant's submittal and checklist responses. Projects missing submittal information with non-acceptable reasoning will be rejected.
4. Items in **BLACK** are required for 'Preliminary Site Plan' approval & 'Final Site Plan' approval.
5. Items in **BLUE** are only required for 'Final Site Plan' approval.

SUBMITTAL INFORMATION - TO BE FILLED OUT BY APPLICANT	
Project Name:	Avesta Biddeford
Planning Board # (if available):	2024.18
Applicant Name/Info:	Avesta Housing
Submittal #/Type (Prelim/Final):	Final Site and Subdivision Applications
Submittal Date:	17-Jul-24

SUBMITTAL REQUIREMENT		APPLICANT RESPONSE		CITY REVIEW RESPONSE	
ITEM NUMBER	DESCRIPTION	INFORMATION PROVIDED (YES/NO)	REASON NOT PROVIDED/COMMENT	ACCEPTABLE (YES/NO-REVISE & RESUBMIT)	COMMENT
1	GENERAL PLAN REQUIREMENTS				
A	Drawing specific legends (linetypes, hatches, etc.)	Yes			
B	Individual drawing layer control should be utilized: freeze/thawing, changing lineweights, and screening (i.e. screen existing layers on a proposed plan, freeze topography and underground utilities on a proposed site plan)	Yes			
C	North arrows, standard engineering scale viewports, dated revision blocks	Yes			
D	All drawings and surveys must be in the following coordinate systems: NAD83 Maine State Plane West (Horizontal) and NAVD88 (Vertical)	Yes			
E	Drawings need to be designed, signed & sealed by a Maine licensed professional engineer (PE); all boundary survey data needs to be performed by a licensed professional land surveyor (PLS)	Yes			
2	COVER SHEET				
A	Project Name & Property Address	Yes			
B	Project Team Contact Information (Owner, Engineer, Contractor, etc.)	Yes			
C	Site Location Map	Yes			
D	Sheet Set List of Drawings	Yes			
E	Tax Map and Lot ID	Yes			
F	Zoning & Shoreland Zone Information	Yes			
G	Existing Use Description	Yes			
H	Proposed Use Description	Yes			
I	Required Waiver/Variances (Yes/No); if yes, plan must clearly list waivers/variances requesting	Yes	See cover letter for details on waivers being requested		
J	Name of Drainage Watershed	Yes	Thatcher Brook		
K	Within the MS4 Urbanized Area (Yes/No)	Yes			
L	Natural resources (streams, wetlands, etc.) located on-site or adjacent to the property (Yes/No)	Yes			
M	Within the 100-year Flood Zone (Yes/No)	No	Flood zone shown where applicable, project not in flood zone		
N	Public Road Proposed (Yes/No)	Yes			
O	Private Road Proposed (Yes/No)	No	No private ways proposed		
P	Public Sewer Connection (Yes/No); if yes, need to include a proposed sewer flow calculation per Maine's Subsurface Wastewater Disposal Rules, Chapter 241, Section 4 (Tables 4A & 4C)	Yes	Based on detailed analysis by City Engineering department		
Q	Public Storm Drain Connection (Yes/No)	No	No public storm drain connections proposed		
R	Limits of Disturbance in acres	Yes	Provided in Stormwater Report		
S	Pervious Land Cover square footage, existing and proposed	Yes	Provided in Stormwater Report		
T	Impervious Land Cover square footage (Pavement/Gravel), existing and proposed	Yes	Provided in Stormwater Report		
U	Building Roof square footage, existing and proposed	Yes	Provided in Stormwater Report		
V	Assigned Planning Board Number	Yes	2024.18 as provided during the sketch plan submission		
W	Estimated cut/fill earthwork volumes; if disturbing within Flood Zone, separate set of earthwork volumes required (site vs. within flood zone)	Yes	Reviewing an overall comparison of existing conditions and proposed conditions, we find that the project yields approximately 5225 cy of cut and 3420 cy of fill, or a net of 1805 cy of cut; not accounting for subbase materials or structural excavation for structures		
3	EXISTING CONDITIONS PLAN				
A	Horizontal & Vertical Datums annotated (NAD83 & NAVD88)	Yes			
B	Survey Benchmark Locations (with XYZ Coordinates annotated)	Yes			
C	Property & Right-of-Way Lines	Yes			
D	Boundary line information (bearings, distances, etc.)	Yes			
E	Property pin and monumentation locations	Yes			
F	Existing easements with proper ownership identified	Yes			
G	Road Names & Individual Lot Labels (Map, Lot, Owner, Acreage)	Yes			
H	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
I	100-year Flood Zone Limits & Elevation	Yes			
J	USDA-NRCS Soil Boundaries and Labels	Yes	Provided in Stormwater Report and Plans		
K	Existing contours with adequate contour labelling; minimum 1' contour interval	Yes			
L	Existing building FFEs annotated	No	No existing buildings on proposed project area		
M	Spot elevations for existing building corners, door entrances, accessible parking/walkways, road centerlines, and bottom/top of curbs	No	No existing buildings on proposed project area		
N	Existing buildings & structures	No	No existing buildings on proposed project area		
O	Existing pavement areas & number of parking spaces	No	No existing parking		
P	Existing ADA ramp geometry, detectable warning plates, and ADA parking spaces	No	No existing sidewalks		
Q	Existing site features (sidewalks, retaining walls, curbing, lightpoles, guide rails, dumpsters, fencing)	No	No existing site features		

R	Existing signage and striping	No	No existing roads		
S	Existing underground utility locations (storm, sewer, force main, water, gas, elec, tele)	No	All utilities are proposed by the accompanying subdivision project		
T	Existing above-ground utility locations (manholes, catch basins, utility poles, hydrants, transformers, riprap)	No	No existing utilities		
U	Rim, invert in, invert out, pipe size, cardinal direction (N, E, S, W) information for any existing utility infrastructure being tied into (upstream/downstream/outfalls)	No	No existing utilities		
V	Existing tree lines, street trees, free-standing trees (12" or larger diameter at breast height), and vegetation	Yes	Site fully wooded		
W	Location of any borings, drinking wells, and monitoring wells	Yes	Included in geotechnial report		
4	SITE DEMOLITION & EROSION CONTROL (E&SC) PLAN				
A	Limits-of-disturbance outlined and acreage annotated	Yes			
B	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
C	100-year Flood Zone Limits	Yes			
D	Callout existing site features to be demolished/removed/replaced	No	No existing structures or infrastructure		
E	Callout existing utilities to be demolished/removed/abandoned-in-place	No	No existing structures or infrastructure		
F	Hatch existing buildings and pavement to be removed	No	No existing structures or infrastructure		
G	Construction Entrance location(s)	Yes			
H	Perimeter E&SC control location(s) (i.e. silt fence, erosion berm mix)	Yes			
I	Stockpile and staging area(s) identified (with proper perimeter control)	Yes			
J	Inlet protection location(s)	Yes			
K	Note requiring contractor to implement dust control measures throughout construction	Yes			
L	Note requiring contractor to pave utility trenches within right-of-way within 3 days of excavation or prior to any rain event	Yes			
M	If groundwater expected, show dewatering/silt bag location(s); show temporary pumping routing				
N	If large development is proposed with an extensive underground stormwater conveyance network, show sediment trap/basin location(s) needed for constructability/phasing; provide sizing calculations				
5	SITE PLAN/SUBDIVISION PLAN				
A	Partial Site Plans needed for any viewport scale greater than 1"=20'	No	Plans provide appropriate detail at these drawing scales		
B	Existing property and right-of-way lines	Yes			
C	Proposed subdivision lot lines and labels	Yes			
D	Required Zoning Setbacks shown with dimensions and annotation	Yes			
E	Bulk requirement summary table (zoning/parking calculations)	Yes	Parking studies provdied in preliminary submission		
F	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
G	100-year Flood Zone Limits	Yes			
H	Proposed building outlines, door entrances and loading docks	Yes			
I	Proposed building labels	Yes			
J	Proposed road extents; provide clear annotation if roads will be public or private	Yes			
K	Proposed parking and accessible parking locations; annotate parking space counts	Yes			
L	Proposed signage, parking striping, and traffic striping	Yes			
M	Detailed ADA ramp geometry, detectable warning surfaces, and ADA parking striping/signage; existing & proposed	Yes			
N	Proposed site features (i.e. curbing, walls, fencing, guiderail, fire hydrant, transformers, light pole locations)	Yes			
O	Separate hatching for buildings, sidewalks, pavement, landscaping	Yes			
P	Proposed landscaping; detailed landscaping design should be on separate plans	Yes			
Q	Designated snow storage areas	Yes			
R	Proposed dumpster locations and trash removal access	Yes			
S	Linear dimensions of all drive aisles, sidewalk widths, parking spaces, loading docks	Yes			
T	Radial dimensions for all curbs, landscaped islands, sidewalks	Yes			
U	Road centerline stationing shown, labelled every 0+50' with curve data	No	Not Applicable, no roadways proposed		
V	If Private Road is proposed, final recorded plans must clearly note that proposed private roads will not be submitted in the future for public acceptance	No	Not Applicable, no private ways		
W	If Private Road is proposed, final recorded plans must clearly note that the City is not responsible for any maintenance, repair, plowing, or trash removal of proposed private roads	No	Not Applicable, no private ways		
X	Planning Board signature block for final recording	Yes			
6	GRADING PLAN				
A	Partial Grading Plans needed for any viewport greater than 1"=20'	No	1" = 30' Plans provided are at an appropriate scale for detail		
B	Limits-of-disturbance outlined and acreage annotated	Yes			
C	Proposed Building Labels with Individual Finished Floor Elevations (FFE)	Yes			
D	Existing contours with adequate contour labelling, screened; minimum 1' contour interval	Yes			
E	Proposed contours with adequate contour labelling; minimum 1' contour interval	Yes			
F	Detailed grading for all ditches, swales, outfalls, and riprap	Yes			
G	All proposed contours tie-into existing contours at limits-of-disturbance outline	Yes			
H	Existing spot elevations for all asphalt and curb tie-in locations	No	Ties into proposed conditions for the Barra Road Subdivision, being jointly applied for		
I	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
J	100-year Flood Zone Limits	Yes	Proposed project does not impact flood zone limits associated with Thatcher Brook		
K	Proposed spot elevations for all important roadway geometric points and/or on a 50' maximum interval: low/high points, PC/PT, road centerline, edge-of-asphalt	Yes			
L	Proposed spot elevations for all curblines (bottom/top-of-curb) and sidewalks	Yes			
M	Proposed spot elevations for all parking and drive aisle geometry points	Yes			
N	Proposed spot elevations for all building corners and door-entry locations	Yes			

	O Proposed retaining wall/loading dock elevations (bottom/top of wall)	No	Not Applicable		
	P Proposed spot elevations for all ADA ramp/landing/parking stall geometry points	Yes			
	Q Proposed % slope arrows for all ADA parking spaces and sidewalks	Yes			
	R Proposed longitudinal % slope arrows for drainage ditch centerlines	Yes			
	S Proposed % slope arrows for roads, parking areas, and landscape tie-in areas	Yes			
	T Estimated cut/fill earthwork volumes; if disturbing within Flood Zone, separate set of earthwork volumes required (site vs. within flood zone)	Yes	Reviewing an overall comparison of existing conditions and proposed conditions, we find that the project yields approximately 5225 cy of cut and 3420 cy of fill, or a net of 1805 cy of cut; not accounting for subbase materials or structural excavation for structures		
7	ROAD PROFILES (if public/private road proposed)	No	Road not Proposed		
	A Existing surface; dashed and screened				
	B Proposed surface; continuous and bold				
	C Corresponding centerline stationing and curve data annotation				
	D Road cross-section including proposed surface cross slopes; include multiple sections for various road cross slope conditions proposed (crowned, superelevated)				
	E Horizontal and vertical scale bars				
	F Clear annotation if proposed road will be public or private				
	G If Private Road is proposed, plans must clearly note that proposed private roads will not be submitted in the future for public acceptance				
	H If Private Road is proposed, plans must clearly note that the City is not responsible for any maintenance, repair, plowing, or trash removal of proposed private roads				
8	UTILITY PLAN				
	A Existing underground utility locations; screened (storm, sewer, force main, water, gas, electric, telecom)	Yes			
	B Existing above-ground utility locations; screened (manholes, catch basins, utility poles, hydrants, riprap)	Yes			
	C Rim, invert in, invert out, pipe size, cardinal direction (N, E, S, W) information for any existing utility infrastructure being tied into (upstream/downstream/outfalls)	No	No existing structures or infrastructure		
	D Proposed underground utility locations; bold (storm, sewer, force main, water, gas, electric, telecom, lighting)	Yes			
	E Proposed above-ground utility locations; bold (manholes, catch basins, utility poles, hydrants, transformers, riprap)	Yes			
	F Proposed storm culverts, outfalls, and riprap locations and sizes	Yes			
	G Storm/sewer structure labels must include: rim, inverts in, inverts out, pipe sizes, cardinal directions (N, E, S, W)	Yes			
	H Storm/sewer pipe labels must include: linear footage, pipe size, material, slope	Yes			
	I Flow directional arrows for storm & sewer pipes	Yes			
	J Proposed & existing site features shown that could conflict with proposed utilities (trees, signs, lightpoles, bollards, foundations, guiderails)	Yes			
	K All storm drains must be sized to convey the 25-year storm	Yes			
	L Sewer force main sizes and invert elevations	Yes			
	M Sewer pump station locations, model, rim, inverts, pipe sizes, cardinal directions (N,E,S,W)	Yes			
	N Grease trap & oil-water separator locations, sizes, elevations	No	Not Applicable		
	O Water, gas, electric, and telecom sizes labelled	Yes			
9	UTILITY PROFILES	No	All gravity drain information shown on plans		
	A Utility profiles for all gravity storm drains and sewer pipes, including all laterals, catch basins, culverts, and outfalls; profiles preferred to be aligned on the pipe centerline (not superimposed on the road centerline)				
	B Existing surface; dashed and screened				
	C Proposed surface; continuous and bold				
	D Storm/sewer structure labels must include: rim, inverts in, inverts out, pipe sizes, cardinal directions (N, E, S, W)				
	E Storm/sewer pipe labels must include: linear footage, pipe size, material, slope				
	F Existing and proposed gravity pipe crossings shown; sizes labelled and depths/clearance annotated				
	G Existing and proposed electric/water/telecom/gas crossings shown at approximate depths; sizes labelled and depths/clearance annotated				
	H Known ledge or groundwater elevations				
	I For all storm drains, 25-year HGL must be shown on profiles with starting tailwater condition identified				
	J For storm outfalls, include riprap sizing and grading extents				
	K Horizontal and vertical scale bars				
10	DETAILS				
	A Road section detail, including pavement & gravel depths	Yes			
	B Sidewalk, paver, crosswalk, and any other pavement section details	Yes			
	C Pavement sawcut detail	Yes			
	D Utility trench/backfill detail	Yes			
	E All site feature details; curbing, retaining walls, fencing, guiderails, dumpsters, etc.	Yes			
	F Signage, striping, and ADA details	Yes			
	G E&S notes and details; only show applicable/proposed measures	Yes			
	H Utility structure details (manholes, cleanouts, fittings, handholes, transformer pads, hydrants)	Yes			
	I Storm outfall & riprap details	Yes			

J	Drainage ditch cross section identifying minimum depth, minimum bed width, and maximum side slopes	Yes			
K	Pump station, grease trap, and oil-water separator details	Yes			
L	Conduit section details	Yes			
M	Miscellaneous details (as needed)	Yes			
11	LANDSCAPING, LIGHTING & PHOTOMETRIC PLANS				
A	As required by ordinance; at a minimum: locations, counts, and species/models must be identified	Yes			
B	Landscaping & lighting details	Yes			
12	DOCUMENTS/REPORTS/CALCULATIONS				
A	On initial preliminary submittal applications, applicant must submit a development review and inspection fee. Applicant to coordinate fee amount with City Planner prior to submittal. This fee will be drawn against to cover the following type of services throughout the project life cycle (and may require replenishing): i. 3rd Party City Peer-Review ii. Site Inspections during the permitting process iii. Erosion & Sediment Control Inspections during construction iv. Right-of-Way Inspections during construction v. Site Punchlist/As-Built Inspections post-construction	Yes	Per Sketch plan application, Sketch Plan Application fees of \$12,915 and Preliminary Application fees \$8,355 have been previously paid, and Final Application fees of \$825 have been submitted with this application.		
B	Predevelopment & Post-development Drainage Area Maps, including: i. Subdrainage areas delineated and labeled ii. Points of Interest/Analysis shown and labeled iii. Hatching for different land cover areas (impervious, pervious, gravel) iv. Time of concentration (Tc) paths & durations v. Four City-standardized stormwater summary tables	Yes			
C	An approved 'Sewer Ability-to-Serve Letter' from the Engineering Department: i. Applicant to submit proposed sewer flow calculations per Maine's Subsurface Wastewater Disposal Rules, Chapter 241, Section 4 (Tables 4A & 4C)	Yes	Provided in prelimiary application		
D	A Performance Guarantee Cost Estimate utilizing Planning's template	Yes	Provided as Attachment 5		
E	25-year hydraulic calculations for all storm conveyance piping (rational method), including starting tailwater conditions/documentation	Yes	See Stormwater Report		
F	If any SWM water quality BMP or detention facility is proposed, hydrologic model exports/hydrographs must be submitted for the for the 2, 10, 25, & 100-year storm frequencies	Yes	See Stormwater Report		
G	Sizing calculations for any SWM water quality BMP or detention facility	Yes	See Stormwater Report		
H	A stormwater maintenance manual for any proposed SWM water quality BMP or detention facility, including: i. Annual maintenance requirements ii. Annual inspection requirements by a licensed PE; noting that all inspection reports/logs need to be submitted to the Engineering Department by March 1st each following year, identifying what on-going maintenance has occurred and what remedial repairs are needed iii. Signed Property Owner Agreement: including the current property owner's contact information and signature; it must be noted that all stormwater BMP maintenance requirements are linked to the property for perpetuity and transfer to any new ownership	Yes	See Stormwater Report		
I	Salt Management Plan	Yes	Provided with preliminary application		
J	Sewer pump station sizing calculations	Yes			
K	Sewer pump station maintenance plan	No	To be provided for final application		
L	Grease trap sizing calculations	No	Not Applicable		
M	Homeowner Association (HOA) agreement for any private road serving two (2) lots or more	No	Not Applicable		
N	Summary list & copy of any required DOT/DEP/USACE permits & approvals	Yes	Project has applied for Maine DEP Stormwater Law Permit, copies provided to City		

Whitten, Nan

From: Tom Saucier <tsaucier@sitedesignassociates.biz>
Sent: Thursday, July 25, 2024 10:24 AM
To: Galbraith, David; Whitten, Nan; Chekan, Craig
Subject: Avesta

EXTERNAL: This email originated from outside of the City of Biddeford email system. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi David

Per your request we have undertaken a review of the final plans and documentation submitted for the referenced project. The documents were revised in response to our May 30, 2024 comments, and staff comments and feedback as well. The documentation consisted of the plan checklist, responses to previous review comments, a Maine Water ability to serve letter, an updated sewer design report, and the city cost estimate worksheet.

Based on our review of the documentation and plans dated July 17, 2024, it appears the majority of our comments have been addressed. The following comments remain outstanding, and include several new comments related to the revised plans:

Per your request we reviewed the checklist items:

Although items may not be on the specific plans listed in the checklist, we reviewed the checklist to confirm the information is provided in the overall submission.

3.W. The comment is made that the boring information is included in the geotechnical report which was not submitted. That seems satisfactory to us for a project of this nature.

4. No stand-alone Site Demolition and Erosion Control plan has been provided. The applicant commented there are no existing site features or structures to be demolished.

5 and 6. Site and Grading Plans - The plans submitted do not meet the requirement for having a scale of 1" = 20 ft. The applicant commented that the plans provide appropriate detail at the scales shown. We tend to agree with that for a project of this size and nature, assuming the utility information is removed from the grading plan.

8. Utility Plan - No stand-alone utility plan was provided, and utilities were shown on the site plan and grading plan. The grading plan is cluttered. A separate utility plan should be provided per the checklist, or the utility information shown on the site plan.

9. Utility profiles - No plan was provided. The applicant commented that the gravity sewer and storm drain information is shown on the plans. For a project of this nature and size, we do not believe that profiles would contribute much information to the overall site plan.

Drawings (numbered per May 30 comments)

1.a. A key for signage should be provided.

1.d. The limits of this project should be clarified. We understand this is a separate project from the Trailside Way construction. Any work shown on the drawings that is not associated with the Avesta project should be screened. Utilities to be installed as part of the Trailside Way project should be shown as existing.

1.1 (new) Will flush curb be installed in front of the accessible space or will there be striping?

1.2. (new) The fire lane should be dimensioned.

1.3. (new) Is the G next to the pad mounted transformer a stand-by generator?

2.d. It is difficult to tell exactly where the spot grades are intended. Leaders or other means should be used to clarify this.

2.1. (new) The curb shown in the parking lot above the snow storage areas is not conducive to and will be damaged by snow plowing operations. The curbing is an integral part of the stormwater management plan, and if damaged, it will impact that plan.

2.2. (new) The grades for the fire lane reflect no cross slope. The runoff will likely flow along the gravel surface and the surface will be susceptible to erosion, creating a maintenance issue.

2.3. (new) The limit of disturbance for this project should be shown on the drawing and be discernable from the Trailside Way work.

3.1 (new) A typical section for the sidewalk and curb should be provided.

4.b. The inspection requirements for the soil filters should include prior to the back fill of the underdrains.

4.b. (new) An additional inspection step should be after the drainage layer is complete, prior to the placement of filter material, per the DEP BMP manual.

4.c. A TRM should be specified for placement in the emergency spillway.

4.(new)

4.1 The grading of the soil filter should be updated to reflect the emergency spillway construction.

4.2. The design provides 6" of embankment freeboard and indicates the emergency spillway is activated for the 25 year storm. Also, the emergency spillways are shown to be 6" deep. We recommend a minimum of 1 ft of freeboard for the design storm, and a minimum depth of 1 foot for the emergency spillway.

4.3. The forebays should be dimensioned. The entire forebay should be stone.

4.4 We recommend that sumps be provided in the outlet control structures.

Sheet 7. (new) Documentation requirements for inspections during construction should be included on the plan.

These comments are technical in nature and could be included as conditions of approval if you and the planning board are so inclined.

Thanks
Tom

Tom Saucier, P.E.
Site Design Associates
23 Whitney Way
Topsham, Maine 04086
207-449-4275

Whitten, Nan

From: Chris MacDonald <cmacdonald@bh2m.com>
Sent: Thursday, July 25, 2024 10:51 AM
To: Whitten, Nan
Cc: Galbraith, David; Iriqat, Adi; meon@mikeeonassoc.com; Ryan Fecteau
Subject: RE: Avesta

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Thank you very much Nan,

These comments are all minor in nature, and we would request that these be provided as conditions of approval to address.

Thank you,
-crm

Christopher MacDonald, P.E.
Civil Engineer

BH2M

380B Main Street
Gorham, Maine 04038
207 839-2771 x 203
www.bh2m.com



From: Whitten, Nan <Nan.Whitten@Biddefordmaine.org>
Sent: Thursday, July 25, 2024 10:42 AM
To: Chris MacDonald <cmacdonald@bh2m.com>
Cc: Galbraith, David <David.Galbraith@biddefordmaine.org>; Iriqat, Adi <adi.iriqat@biddefordmaine.org>
Subject: FW: Avesta
Importance: High

Good Morning Chris:

Below are the comments for AVESTA. We know you are on vacation and will see you when you get back.

*Thank you
nan*

From: Tom Saucier <tsaucier@sitedesignassociates.biz>
Sent: Thursday, July 25, 2024 10:24 AM
To: Galbraith, David <David.Galbraith@biddefordmaine.org>; Whitten, Nan <Nan.Whitten@Biddefordmaine.org>;

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Tom

Tom Saucier, P.E.
Site Design Associates
23 Whitney Way
Topsham, Maine 04086
207-449-4275

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CITY OF BIDDEFORD

Planning and Development Department

David C.M. Galbraith Deputy Director/City Planner

205 Main Street

P.O. Box 586

Biddeford, ME 04005

(207) 284-9115

David.Galbraith@biddeford.maine.org

PLANNING BOARD STAFF REPORT

TO: Chair Patoine and Members of the Biddeford Planning Board

FROM: David C.M. Galbraith, Deputy Director/City Planner

DATE: July 31, 2024

RE: **2024.29 Final Plan Review; Site Plan, Subdivision and Contract Zone #24 for Westbrook Development Corporation (WDC) / Proposed Construction of 76-unit affordable housing development at 37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone**

MEETING DATE: August 7, 2024 at 6:00 PM

1. INTRODUCTION

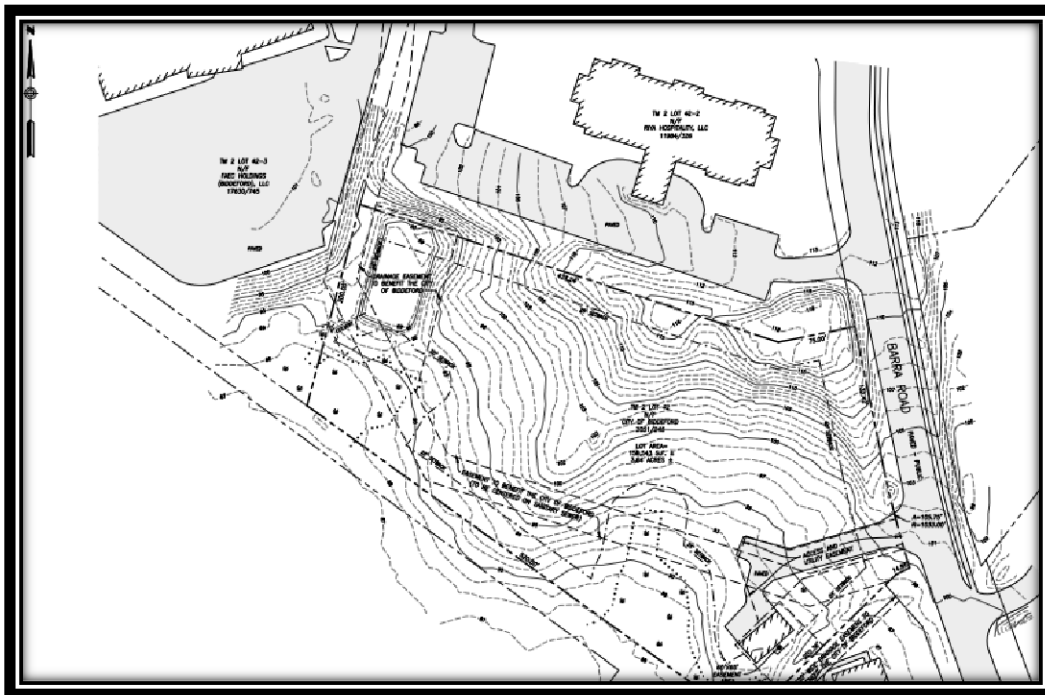
This Application was last before the Planning Board on July 17, 2024 where the project received Preliminary Site Plan, Subdivision and Contract Zone #24 approval. The applicant is seeking Final Plan Approval at this time. The Westbrook Development Corporation (Developer), Thatcher Brook Apartments I, LP (Owner), and Thatcher Brook Apartments II, LP (Owner), Gorrill Palmer, collectively referred to as "WDC" or "Applicant/s", are pleased to make this Final Site Plan, Final Subdivision and Contract Zone #24 submission for the proposed 76-unit multi-family residential development project at 37 Barra Road (Tax Map 2, Lot 42), Biddeford, ME. Gorrill-Palmer has been retained and authorized by the Applicant to perform all work necessary to submit this application. An initial Sketch Plan submission was made in May 2024 and reviewed at the June 5th, 2024, Planning Board meeting. The subject property is located within the City's I-3 Zoning district and the proposed residential development will require the review and recommendation from Planning Board to the City Council for the approval of the proposed Contract Zone #24, which is part of this application.

The proposed project will develop two (2) new multi-family apartment buildings totaling 76-units utilizing the MSHA low-income housing tax credit program. One building will provide affordable non-age restricted housing units and the other will provide affordable senior housing units for those aged 55+.

PROJECT DESCRIPTION: The parcel, located at 37 Barra Road, is currently owned by the City of Biddeford and is approximately 3.65-acres. The parcel is identified as Map 2, Lot 42 according to the City of Biddeford's Assessor's Maps. The subject lot was created and identified as Lot #1 in a City of Biddeford subdivision which was created in 1999 and received a MeDEP SLODA Permit¹ at that time. The subdivision was known as the Exit 4 Business Park and is now more frequently known as the Thatcher Brook Business Park. The site is within the I-3 – Commercial Industrial Zone. Westbrook Development Corporation has requested a contract zone to build the proposed plan. A copy of the Option to Purchase Agreement is included in Attachment B of the Applicant's Preliminary application. The applicant has

**2024.29 Final Plan Review; Site Plan, Subdivision and Contract Zone #24 for Westbrook Development Corporation (WDC) / Proposed Construction of 76-unit affordable housing development at 37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone.
Planning Board Hearing Date: August 7, 2024**

provided a well written and detailed narrative of their project, which is located in their Final Application. The application also provides an overview of each of the Site Design Criteria § XI-II.-5B. and Subdivision Review Requirements § 66-39 (d).

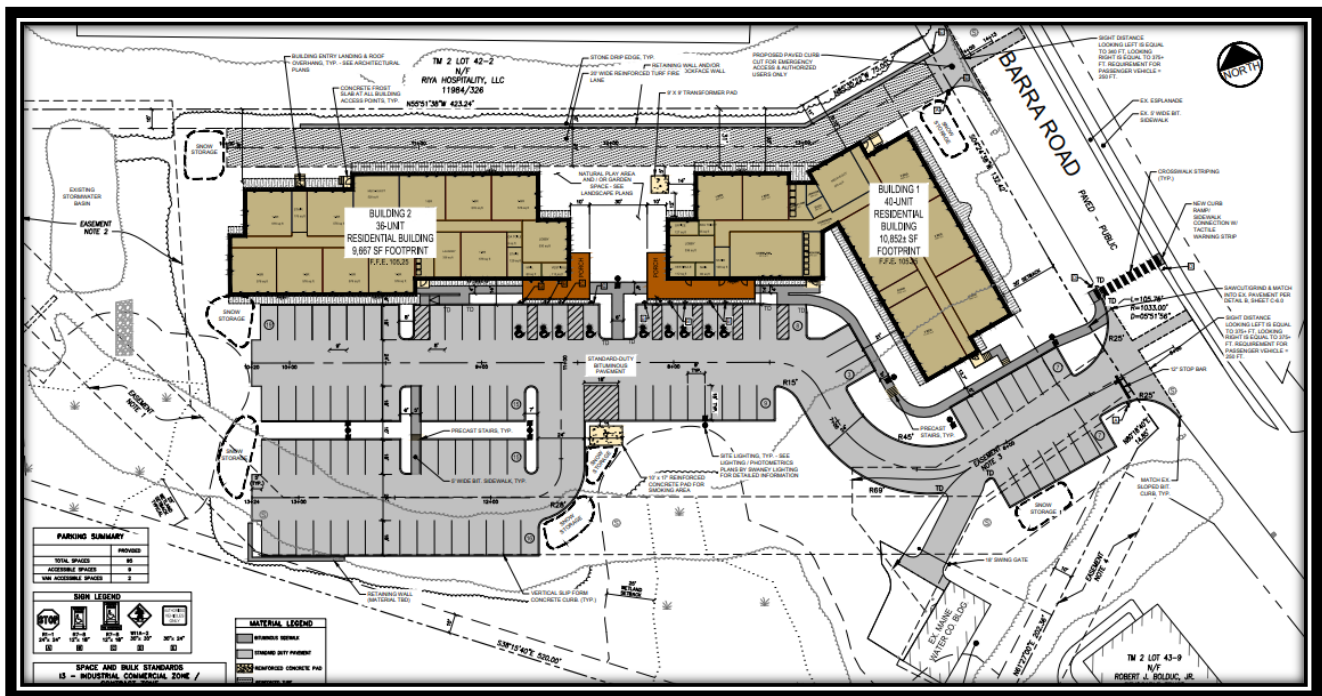


Existing Conditions Plan – 37 Barra Road

The subject property is currently owned by the City of Biddeford and the development would require the purchase of the land. The property is 3.65-acres in area and is located within the City's I-3 Zoning District. The property is currently vacant, except for a sewer pump station (building) with a small, paved access drive / parking area. The lot includes an access and utility easement for the pump station and associated parking in addition to an "easement to benefit the City of Biddeford (to be centered on sanitary sewer)" approximately 30' wide. The remainder of the land remains undeveloped.

The proposal includes the construction of two (2) multi-story buildings with a total of 76-units of affordable rental housing. As stated in their application narrative; *"Our team aims to develop two new multifamily apartment buildings consisting of up to 80 units of affordable rental housing. This site, currently owned by the City of Biddeford, is an excellent location for such a development due to its existing infrastructure, bus lines, and proximity to various amenities and employment opportunities"*. The application also describes the population they serve, stating, *"Our concept envisions 100% of the proposed units to be reserved as affordable housing. The existing funding sources managed by Maine Housing typically require affordability to be set for households earning up to 50% and 60% of Area Median Income (AMI)"*. The proposed plans illustrate 36-units within a 9,667 square foot building footprint, located within the western ½ of the lot and a 40-unit building with a 10,852 square foot footprint parallel to Barra Road.

**2024.29 Final Plan Review; Site Plan, Subdivision and Contract Zone #24 for Westbrook Development Corporation (WDC) / Proposed Construction of 76-unit affordable housing development at 37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone.
Planning Board Hearing Date: August 7, 2024**



WDC – Final Plan - 37 Barra Road – Revised Parking Design and Emergency Access

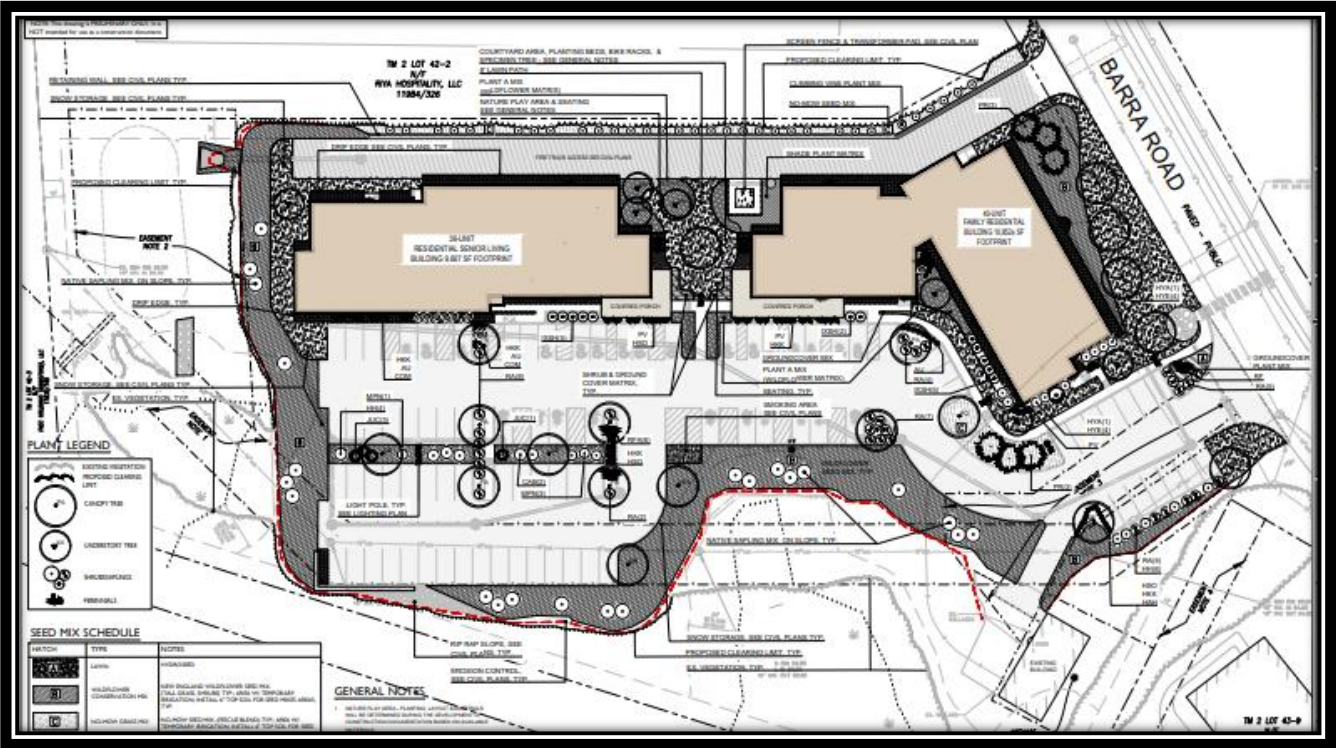
The Applicants have been working with the City's Fire Department to amend the site design to provide emergency access and maneuverability on site. Shown above is the revised / final site plan, illustrating the following features:

- An emergency access fire lane is provided along the northern property line with fire department connections on the rear (north) of the buildings.
- A drive aisle / fire lane has been illustrated along the front (south) of both buildings.
- The central parking lot has been redesigned to provide an emergency vehicle turn-around.
- Snow storage areas are illustrated on the plans.
- A "potential natural play area or garden space", has been placed between the two buildings, adjacent to the front / side porches of the buildings.
- Site lighting.
- As suggested by the Planning Board, the interior sidewalk system has been proposed pedestrian crosswalk from the property, crossing Barra Road and connecting to the existing Barra Road sidewalk system has been added.

2024.29 Final Plan Review; Site Plan, Subdivision and Contract Zone #24 for Westbrook Development Corporation (WDC) / Proposed Construction of 76-unit affordable housing development at 37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone.
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WDC – Final Plan - 37 Barra Road - Wetlands Identified in Blue and Original Parking Design



WDC – Final Plan - 37 Barra Road – Landscape Plan

2024.29 Final Plan Review; Site Plan, Subdivision and Contract Zone #24 for Westbrook Development Corporation (WDC) / Proposed Construction of 76-unit affordable housing development at 37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone.
Planning Board Hearing Date: August 7, 2024

The Application goes on to outline their proposal as:

Development Proposal *Our development plan includes two distinct buildings:*

- 1. Senior Housing Building: Reserved for residents aged 55 and older, this 36-unit building will consist entirely of one-bedroom apartments. This design is intended to cater to the needs of seniors, providing them with comfortable, manageable living spaces.*
- 2. Mixed-Use Family Building: This 38-unit building will not be age-restricted and will offer a mix of one-bedroom, two-bedroom, and three-bedroom units. Specifically, 50% of the units will be one-bedroom, while the remainder will be two-bedroom and three-bedroom units. This mix is designed to accommodate a variety of family sizes and living arrangements, ensuring broad community appeal.*

The buildings will have community spaces, air conditioning, outdoor seating areas, indoor trash rooms, laundry rooms, and free Wi-Fi for telemedicine services. The buildings will be designed with energy efficiency in mind utilizing efficient electric HVAC heating and cooling systems and will target other energy efficiency goals like high end insulation, roof top solar panels, and conduits for future EV charging stations. Utilities will be included in tenant's rent as a means to help keep all of their housing costs both predictable and affordable.

Accessibility and Infrastructure: *The site is exceptionally well-positioned to support affordable housing due to its accessibility to key infrastructure:*

- Public Transportation: The site is well served by existing bus routes along Barra Road, which is crucial for residents who rely on public transit.*
- Utilities: The land is serviced by public water and sewer systems, and three-phase power is available, providing reliable and efficient utilities for the buildings.*
- Proximity to Highway: The site's closeness to the highway enhances connectivity, making it easier for residents to travel to and from work and other destinations.*
- Nearby Amenities: The area is surrounded by employment opportunities and amenities suitable for both families and seniors, such as shopping centers, healthcare facilities, and recreational areas.*

Traffic Review and Parking Analysis: The City's Peer Review Traffic Engineer has reviewed the proposed traffic and parking analysis and recommends the following:

- A. To change the left-turn signal phasing from "Protected/Permitted" to "Protected Only", to reduce the left-turn angle crashes at the Route 111/Barra Road intersection since it is an HCL. The assessed fee for each unit will be \$130.00 or a total of \$9,880.00 for both buildings.*

A condition of Approval (COA) regarding this matter has been added.

2024.29 Final Plan Review; Site Plan, Subdivision and Contract Zone #24 for Westbrook Development Corporation (WDC) / Proposed Construction of 76-unit affordable housing development at 37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone.
Planning Board Hearing Date: August 7, 2024

WDC's Desired Project Approvals: The Applicant's goal is to receive all their municipal and state approvals by August 23rd in order to be eligible to apply for Maine Housing's annual funding round in September 2024. They note that funding is extremely competitive and there are always more deserving projects than there is funding available. As such, it is not uncommon for projects to need to reapply more than once for Maine Housing funding. The proposed development will also require approval of the proposed Contract Zone (#24), currently under review with this application.

It should be noted that this development proposal came together following a phone call from the George Gervais, the City's Economic Development / Planning Director, to WDC following their denial of a similar project in another community whose residents voted against the low / moderate income housing project. Seeing the need for affordable housing, which remains a high priority of the City Council, Mr. Gervais reached out to WDC's representatives, and was a natural fit to attract the Applicant to Biddeford. As such, the Applicants are seeking to get all municipal approvals by August 23, 2024 to enable the project to be eligible grant funding for September 2024.

3. PROJECT DATA/INFORMATION

1.	Applicant:	Westbrook Development Corporation 30 Liza Harmon Drive Westbrook, ME 04092
2.	Owner of Property:	City of Biddeford
3.	Agent:	Owen Haskell, Inc.
4.	Surveyor:	Owen Haskell, Inc. – Professional Land Surveyors
5.	Project Location:	37 Barra Road
6.	Project Tax Map #/Lot #:	Tax Map 2, Lot 42
7.	Lot Size:	3.65 Acres
8.	Base Zoning:	I-3
9.	Overlay Zoning:	N/A
10.	Existing Use:	Vacant Lot
11.	Proposed Use:	Affordable Housing
12.	Approvals Required:	Site Plan and Subdivision Review
13.	Uses in the Vicinity:	Mixed use, commercial, medical
14.	Waivers Needed:	Waiver Request to Article VI, Section 26. F, for slopes greater than 3:1 and grading within 10' of property lines.
18.	Waivers Granted:	None at this time

2024.29 Final Plan Review; Site Plan, Subdivision and Contract Zone #24 for Westbrook Development Corporation (WDC) / Proposed Construction of 76-unit affordable housing development at 37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone.
Planning Board Hearing Date: August 7, 2024

22.	Other Non-City Permits Required:	N/A
23.	LDR Attachment A: Fees Paid:	Yes
25.	Planning Board Review History: 6-5-24 Sketch Plan 7-17-24 Preliminary Plan Review 8-7-24 (ANTICIPATED- Final Plan Review)	

4. REVIEW PROCESS

Per City ordinance, this application is subject to Site Plan (Land Development Regulations, Article XI) and Subdivision Review (Chapter § 66-39) which review approval by the Planning Board. This requires the following:

- A. Site and Subdivision Sketch Plan Review;
- B. Site and Subdivision Preliminary Review and;
- C. Site and Final Review;
- D. Contract Zone: The project will also require a Contract Zone which will, require City Council approval following Planning Board review and recommendation.

5. WAIVERS:

A. Waiver Request to Article VI, Section 26. F, for slopes greater than 3:1 and grading within 10' of property lines.

Staff is supportive of the request and recommends that the Planning Board grant the waiver.

6. Recommended Motions:

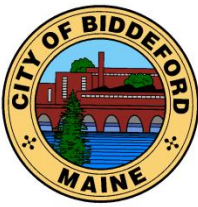
- A. Waiver Request – Motion to Approve: Motion to Approve Waiver Request to Article VI, Section 26. F, for slopes greater than 3:1 and grading within 10' of property lines.
- B. Contract Zone - Motion to Approve: I motion to send a positive recommendation to the City Council to approve the proposed Contract Zone # 24, as written.
- C. Site Plan and Subdivision Motion to Approve: I motion to APPROVE Case # 2024.29 Final Site Plan and Subdivision Review for Westbrook Development Corporation (WDC) for the proposed construction of a 76-unit affordable housing development at 37 Barra Road (Tax Map 2, Lot 42), within the I-3 Zone with the attached Findings of Fact (FOF) and Conditions of Approval (COA), as written.
- D. Motion to Deny I motion to DENY Case # 2024.29 Final Site Plan and Subdivision Review for Westbrook Development Corporation (WDC) for the proposed construction of a 76-unit affordable housing development located at 37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone and forward a positive recommendation to the City Council to approve Contract Zone #24, for the following reasons:

- 1) _____.
- 2) _____.
- 3) _____.

2024.29 Final Plan Review; Site Plan, Subdivision and Contract Zone #24 for Westbrook Development Corporation (WDC) / Proposed Construction of 76-unit affordable housing development at 37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone.
Planning Board Hearing Date: August 7, 2024

- E. Motion to Table: I motion to TABLE # 2024.29 Final Site Plan and Subdivision Review for Westbrook Development Corporation (WDC) for the proposed construction of a 76-unit affordable housing development located at 37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone and forward a positive recommendation to the City Council to approve Contract Zone #24, for the following reasons:

- 1) _____.
- 2) _____.
- 3) _____.



CITY OF BIDDEFORD

Planning and Development Department

David Galbraith
City Planner & Deputy Director of Planning &
Development
205 Main Street
P.O. Box 586
Biddeford, ME 04005
(207) 284-9115
David.galbraith@biddefordmaine.org

FINDINGS OF FACT AND CONCLUSIONS OF LAW
2024.29 Final Plan Review; Site Plan, Subdivision
Westbrook Development Corporation (WDC)
Construction of 76-unit affordable housing development
37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone.
Contact Zone #23 Recommendation to City Council
August 7, 2024

RE: 2024.29 Final Plan Review; Site Plan, Subdivision and Contract Zone #24 for Westbrook Development Corporation (WDC) / Proposed Construction of 76-unit affordable housing development at 37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone.

Pursuant to the provisions of the City of Biddeford Code of Ordinances Land Development Regulations, Article XI (Site Plan Review), and Article VI (Performance Standards), the Biddeford Planning Board has considered the application of Based on its review, including supportive data, public hearing testimony and related materials contained in the record, the Planning Board makes the following Findings of Fact and Conclusions of Law:

1. PROJECT DATA/INFORMATION

1.	Applicant:	Westbrook Development Corporation 30 Liza Harmon Drive Westbrook, ME 04092
2.	Owner of Property:	City of Biddeford
3.	Agent:	Owen Haskell, Inc.
4.	Surveyor:	Owen Haskell, Inc. – Professional Land Surveyors
5.	Project Location:	37 Barra Road
6.	Project Tax Map #/Lot #:	Tax Map 2, Lot 42
7.	Lot Size:	3.65 Acres
8.	Base Zoning:	I-3
9.	Overlay Zoning:	N/A * Contract Zoning Request
10.	Existing Use:	Vacant Lot
11.	Proposed Use:	Affordable Housing
12.	Approvals Required:	Site Plan and Subdivision Review
13.	Uses in the Vicinity:	Mixed use, commercial, medical
14.	Waivers Needed:	Waiver Request to Article VI, Section 26. F, for slopes greater than 3:1 and grading within 10' of property lines.

FINDINGS OF FACT AND CONCLUSIONS OF LAW

**Westbrook Development Corporation (WDC)
2024.29 Final Plan Review; Site Plan, Subdivision
76-unit affordable housing development
37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone.
Contact Zone #24 Recommendation to City Council
August 7, 2024**

18.	Waivers Granted:	Waiver Request to Article VI, Section 26. F, for slopes greater than 3:1 and grading within 10' of property lines.
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CONCLUSIONS OF LAW:

1. The proposed use meets specific requirements set forth in this ordinance and would be in compliance with applicable state or federal laws;
2. The proposed use would not create fire safety hazards by providing adequate access to the site, or to the buildings on the site, for emergency vehicles and would not create hazards through the storage of chemicals and wastes;
3. The proposed exterior lighting, where allowed, would not create hazards to motorists traveling on adjacent public streets or is adequate for the safety of occupants or users of the site or would not damage the value and diminish the usability of adjacent properties;
4. The provisions for buffers and on-site landscaping provide adequate protection to neighboring properties from detrimental or unsightly features of the development;
5. The proposed use would not have a significant, detrimental effect on the use and peaceful enjoyment of abutting property as the result of noise, vibrations, fumes, odor, dust, glare, hours of operation, or other causes;
6. The provisions for vehicular loading and unloading and parking and for vehicular and pedestrian circulation on the site and onto adjacent public streets would not create hazards to public safety or traffic congestion;
7. The proposed use would generate a volume of traffic that can reasonably be accommodated by the existing road network, or would not create unreasonable traffic hazards or would not exacerbate an existing traffic hazard, or would not create unreasonable traffic congestion;
8. The proposed use would not have a significant, detrimental effect on the value of adjacent properties which could be avoided by reasonable modification of the proposal;
9. The proposed use would not have an adverse impact on the privacy of the residents of the immediate area (within 500 feet) which could be avoided by reasonable modification of the proposal;

FINDINGS OF FACT AND CONCLUSIONS OF LAW

**Westbrook Development Corporation (WDC)
2024.29 Final Plan Review; Site Plan, Subdivision
76-unit affordable housing development
37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone.
Contact Zone #24 Recommendation to City Council
August 7, 2024**

10. The proposed use would be in compliance with Biddeford's Comprehensive Plan;
11. The proposed use would not have an adverse impact on the immediate neighborhood or the community relative to architectural design, scale, bulk and building height, identity and historical character, or visual integrity, which could be avoided by reasonable modification of the proposal;
12. The design of the site would not result in significant flood hazards or flood damage or would be in conformance with applicable flood hazard protection requirements;
13. Adequate provision has been made for disposal of wastewater or solid waste or for the prevention of ground or surface water contamination;
14. Adequate provision has been made to control erosion or sedimentation;
15. Adequate provision has been made to handle stormwater runoff or other drainage problems on the site; and the proposed development will not unduly burden off-site surface water systems;
16. The proposed water supply would meet the demands of the proposed use for fire protection purposes;
17. Adequate provision has been made for the transportation, storage, and disposal of hazardous substances and materials as defined by state law;
18. The proposed use would not have an adverse impact on scenic vistas or on significant wildlife habitat or wetland areas and water bodies which could be avoided by reasonable modification of the proposal;
19. When located in the Shoreland Zone, the proposed use would meet the purposes of Shoreland Zoning as identified in Article XIV, Section 1 (Purposes) of this ordinance.

APPROVAL GRANTED:

Based on the evidence available and the conclusions above, the Biddeford Planning Board approves the proposed project summarized within the attached Staff report and pursuant to the provisions of the City of Biddeford Code of Ordinances Land Development Regulations, Article XI (Site Plan Review), and Article VI (Performance Standards), the Biddeford Planning Board has approved the application # 2024.29 for Final Site Plan Review; Final Subdivision and Contract Zone #24 for Westbrook Development Corporation (WDC) for the proposed construction of 76-unit affordable housing development at 37 Barra Road (Tax Map 2, Lot 42), in

FINDINGS OF FACT AND CONCLUSIONS OF LAW

**Westbrook Development Corporation (WDC)
2024.29 Final Plan Review; Site Plan, Subdivision
76-unit affordable housing development
37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone.
Contact Zone #24 Recommendation to City Council
August 7, 2024**

the I-3 Zone with the recommended Findings of Fact (FOF) with the following Conditions of Approval (COA):

1. The material provided for the proposed project has been reviewed only for general conformance to the City technical requirements. The applicant(s) and/or their technical consultant shall be responsible for the actual design details and completeness of their work. It is incumbent upon the applicant(s) to ensure that the project is in conformance and complies with all City Codes, ordinances and regulations as well as with all state regulations, including, but not limited to, space and bulk standards, performance standards, use standards and other zoning type requirements.
2. All work shall be in conformance with the approved plans and submission documents. No deviations from the approved plans are permitted without prior approval from the Planning Board for major changes, and from the City Planner and City Engineer for minor changes. The City Planner shall make the determination of major or minor.
3. A Letter of Credit or other surety acceptable to the City of Biddeford shall be submitted prior to the issuance of permits or site work being initiated. The financial guarantee shall be established for 150% of the cost of the following improvements:
 - a. Landscaping
 - b. Paving
 - c. Work within ROW (existing or proposed)
 - d. Stormwater Drainage
 - e. Loam & seed
 - f. Sediment & erosion control
 - g. As-Built Plans
 - h. Property Monuments
4. Prior to any ground disturbance, the applicant shall establish a construction inspection account equal to: \$2,500.00.
5. Prior to any ground disturbance, a pre-construction meeting with the owner/applicant, contractor, and City is required. Contact the Engineering Department to schedule this meeting.
6. Contact the Department of Public Works for driveway location permits, curb cut permits and/or street opening permits prior to the start of construction.
7. An as-built plan must be provided to the City of Biddeford Engineering Office at the end of the project electronically, which can be read by the City of Biddeford's Geographic Information System software. Note: Any modifications to the Planning

FINDINGS OF FACT AND CONCLUSIONS OF LAW

**Westbrook Development Corporation (WDC)
2024.29 Final Plan Review; Site Plan, Subdivision
76-unit affordable housing development
37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone.
Contact Zone #24 Recommendation to City Council
August 7, 2024**

Board approved development plans shall be reviewed and approved by the City Planner prior to being made, including any "field changes".

8. The applicant shall incorporate appropriate erosion control measures into this project to reduce erosion affects from the work. All disturbed areas must be re-vegetated and/or otherwise stabilized at the appropriate stage of the work per Maine DEP standards in the Best Management Practice (BMP) manual.
9. That the Article VI Performance Standards requirements regarding Dust, Fumes, Vapors & Gases (sect 25), Explosive Materials (sect 28), Glare (sect 37), Noise (sect 48) be followed.
10. The applicant shall obtain all other pertinent local, state and federal permits, licenses, and insurance such as blasting, building, electrical, plumbing, etc. prior to commencing business.
11. At the completion of the project the owner/applicant shall request a final inspection. This request shall be directed to the Planning Office. Performance guarantees and remaining escrow accounts shall not be released until the Planning Office certifies that the project has been completed and is in compliance with the approval and all applicable City Ordinances.
12. The applicant shall submit approved plans for signature of the City's Planning Board, which shall be recorded in the York County Registry of Deeds. An electronic copy of the recorded plan shall be sent to the Planning Office.
13. This project is contemplated to be constructed in two (2) phases, which may be constructed on separate timelines.
14. Prior to the Issuance of a Building Permit the Applicant shall pay a one-time fee of \$17,625. for the Thatcher Brook Impact Fee, as outlined below:

Type of Surface	Compensation Fee (per acre)	Proposed Area (acres)	Compensation Fee
Non-Roof Impervious Area	\$12,500	1.11	\$13,875
Roof	\$5,000	0.47	\$2,350
Landscape Area	\$2,500	0.56	\$1,400
Total			\$17,625

15. Curb-Opening Permit Fee: Prior to the issuance of a Building Permit the Applicant shall pay the associated driveway / curb-opening fee.
16. Sewer Connection Fee: Prior to the issuance of a Building Permit the Applicant shall pay the estimated sewer connection fee of 175,156.40.

FINDINGS OF FACT AND CONCLUSIONS OF LAW

**Westbrook Development Corporation (WDC)
2024.29 Final Plan Review; Site Plan, Subdivision
76-unit affordable housing development
37 Barra Road (Tax Map 2, Lot 42), in the I-3 Zone.
Contact Zone #24 Recommendation to City Council
August 7, 2024**

- A. 40-Unit Building: The ESTIMATED sewer connection fee for the 40-unit building is \$92,187.58. The final fee amount shall be provided, by the City's Engineering Department, at the time of building permit issuance. This fee shall be paid prior to building permits being issued for this structure.
 - B. 36-Unit Building: The ESTIMATED sewer connection fee for the 40-unit building is \$82,968.82. The final fee amount shall be provided, by the City's Engineering Department, at the time of building permit issuance. This fee shall be paid prior to building permits being issued for this structure.
17. Within 30 days from the closing of the purchase of the subject property, a cash contribution of \$400,000. Shall be paid to the City of Biddeford towards the required sewer capacity upgrades.
18. Prior to the scheduling of the required pre-construction meeting the Applicant shall confirm with the Public Works Director that the stormwater pond is sized and will be constructed appropriately.
19. The Applicant shall work with the Director of Public works to modify the left-turn signal phasing from "Protected/Permitted" to "Protected Only", to reduce the left-turn angle crashes at the Route 111/Barra Road intersection since it is a high crash location (HCL). The assessed fee for each unit will be \$130.00 or a total of \$9,880.00 for both buildings. These fees shall be paid as follows:
- C. 40-Unit Building: The fee for the 40-unit building permit is \$5,200.00 which shall be paid prior to building permits being issued for this structure.
 - D. 36-Unit Building: The fee for the 36-unit building permit is \$4,680.00 which shall be paid prior to building permits being issued for this structure.
20. This approval is valid through December 31, 2027. Building permits shall be issued and construction begun within this stipulated time period or the approval becomes invalid.

Larry Patoine Planning Board Chair

Date

CONTRACT ZONE # 24 AGREEMENT
(THATCHER BROOK APARTMENTS)
37 Barra Road (Map 2 Lot 42)

THIS CONTRACT ZONE AGREEMENT is entered into effective the ____ day of _____, 2024~~3~~, by and between Westbrook Development Corporation, a Maine nonprofit corporation, Thatcher Brook Apartments I, LP, a Maine limited partnership, and Thatcher Brook Apartments II, LP, a Maine limited partnership (collectively and together with their successors and assigns, the “Developer”), and the City of Biddeford, a body corporate and politic located in Biddeford, Maine (the “City”).

RECITALS:

WHEREAS, the City of Biddeford is owner of a certain lot or parcel of land located at 37 Barra Road, in the City of Biddeford, County of York, Maine, which is designated as Tax Map 2, Lot 48, and contains approximately 3.64 acres (the “Property”);

WHEREAS, the Developer is under contract with the City to acquire the Property from the City in order to develop the Property across one or more phases into up to 80 units of affordable housing across one or more buildings (the “Project”);

WHEREAS, in order to facilitate the Project, the Developer requires certain changes to the requirements of the City Code of Ordinances that would be applicable to the Project;

WHEREAS, the City and the Developer have agreed to rezone the Property to allow for the construction of the Project subject to the conditions and restrictions set forth in this Agreement;

WHEREAS, the City Council of the City of Biddeford adopted the Biddeford Comprehensive Plan 2023 (the “Comprehensive Plan”) on June 6, 2023 which set the goal to “Increase the supply of safe and adequate housing for low- to moderate income person”;

WHEREAS, the Comprehensive Plan also provided for a Commercial Industrial Growth Area in which the City of Biddeford would pursue the goal of “higher density housing and mixed-use development along key corridors” including along Route 111; and

WHEREAS, the City, acting through the City Council, having determined that the rezoning of the Property would be and is consistent with the City’s growth management program and the Comprehensive Plan adopted pursuant to 30-A M.R.S.A. § 4321, *et seq.* and the existing and permitted uses within the original zones, has authorized the execution of this Agreement and the amendment of the Zoning Ordinance effective as of the date written above.

NOW THEREFORE, in consideration of the foregoing, the mutual agreements set forth herein, the City and the Developer hereby agree as follows:

1. Zone Change. The City hereby amends the Zoning Map of the City of Biddeford to rezone the Property to be subject to the terms of this Contract Zone #24 Agreement. Except as amended hereby, the requirements of the I-3, shall apply to the Property.
2. Maximum Number of Dwelling Units. The Developer shall be entitled to develop up to 80 dwelling units on the Property across one or more phases and/or one or more multi-family buildings.
3. Affordability.
 - (a) The Developer hereby agrees to develop the Project to meet or exceed the following affordability requirements: a household whose income does not exceed 70% of the median income for the area as defined by the United States Department of Housing and Urban Development under the United States Housing Act of 1937, Public Law 75-412, 50 Stat. 888, Section 8, as amended, can afford a majority (51% or more) of the units ~~that the developer designates as affordable~~ in the development without spending more than 30% of the household's monthly income on housing costs.
 - (b) For the purposes of the Project, this affordability requirement shall be considered met for any one building or phase through an affordability covenant required and administered by Maine State Housing Authority pursuant to the Federal Low Income Housing Tax Credit Program.
4. Dimensional Requirements. Notwithstanding any other provision of the Code of Ordinances, the following dimensional requirements shall apply to the Property:

Minimum Square Feet Per Unit		N/A
Frontage		50 feet
Building Setbacks:		
	Front	30 feet
	Rear/Side	10 feet
Parking, Paving, Storage Setbacks:		
	Front	20 feet
	Rear/Side	0 feet
Max. Height		6 stories or 60 feet
Minimum Parking Required		.66 per dwelling unit
Open Space		250 SF/dwelling unit

Notwithstanding any other provision of the Code of Ordinances to the contrary, the Project may, but is not required to, provide an increase in the number of required parking spaces by 5% to allow for visitor parking.

5. Design Criteria. Notwithstanding any other provision of the Code of Ordinances to the contrary, the City hereby waives for the Project the requirement of the I-3 zone that façades

be of brick or stone, and hereby allows the use of other siding and façade materials as a part of the Project.

6. Phasing and Project Approvals.

- (a) In order to accommodate financing, the Developer may develop the Project across one or more phases as reviewed and approved by the City Planning Board in accordance with applicable site plan and subdivision provisions of the Code of Ordinances (except as amended hereby).
- (b) For the avoidance of doubt, the Developer may amend any site or subdivision plan for the Project submitted and reviewed as part of or concurrent with this Contract Zone #24 in accordance with applicable site plan and subdivision provisions of the Code of Ordinances (except as amended hereby) without amending this Agreement, provided that said amended site plans or subdivision plans comply with the terms of this Agreement.

7. Miscellaneous.

- (a) The provisions of this Agreement shall be deemed restrictions on the use of the Property, except as this Agreement may be amended by future written agreement between the City and the Developer, or its successors and assigns, without the need for approval of any other party except as otherwise provided by law.
- (b) Agreement Runs with the Land. The restrictions, provisions and conditions of this Agreement are an essential part of the rezoning, shall run with the Property, shall bind the Developer and its successors and assigns of said Property or any part thereof, and shall inure to the benefit of and be enforceable by the City and its Code Enforcement Office.
- (c) Applicability of Code of Ordinances. Except as expressly modified by this Agreement, the use and occupancy of the Property shall be governed by and comply with the provisions of the Code of Ordinances of the City.
- (d) Recording. This Agreement shall be duly recorded by the Developer in the York Registry of Deeds within thirty (30) days of the date of this Agreement, with a copy of the recorded instrument provided to the City Manager, or else it is void.
- (e) Construction. This Agreement shall be construed in accordance with the laws of the State of Maine.

[REMAINDER OF PAGE BLANK – SIGNATURE PAGE TO FOLLOW]

IN WITNESS WHEREOF, the parties have caused this instrument to be signed all as effective as the day and date first written above.

CITY OF BIDDEFORD

WITNESS

James Bennett, its City Manager

WESTBROOK DEVELOPMENT
CORPORATION

WITNESS

Agent

Christopher LaRoche, its Authorized

THATCHER BROOK
APARTMENTS I, LP
By: WDC GP, LLC, its General Partner

WITNESS

Christopher LaRoche, its President

THATCHER BROOK
APARTMENTS II, LP
By: WDC GP, LLC, its General Partner

WITNESS

Christopher LaRoche, its President

[NEED TO ADD NOTARY TO MAKE IT RECORDABLE]

Planning Board Case: #2024.29
Map Amendment: Contract Zone #24 for Westbrook Development Corporation (WDC)
Proposal: Construction of 76-unit affordable housing development
Location: 37 Barra Road (Tax Map 2, Lot 42) in the I-3 Zone.
Request: Approval of Contract Zone #24 and Map Amendment



August 1, 2024

Mr. David Galbraith, City Planner

City of Biddeford
205 Main Street
Biddeford, ME 04005

**Subject: Preliminary Site Plan and Subdivision Application
Thatcher Brook Apartments I & II
Tax Map 2, Lot 42 – Biddeford, ME**

Dear Mr. Galbraith:

On behalf of **Westbrook Development Corporation (Developer), Thatcher Brook Apartments I, LP (Owner), and Thatcher Brook Apartments II, LP (Owner)**, Gorrill Palmer is pleased to make this Final Site Plan and Subdivision submission for the proposed 76-unit multi-family residential development project at 37 Barra Road, Biddeford, ME. Gorrill-Palmer has been retained and authorized by the Applicant to perform all work necessary to submit this application. An initial Sketch Plan submission was made in May 2024 and reviewed at the June 5th, 2024, Planning Board meeting. Fees which have been submitted to date by the Applicant include a Sketch Plan Application Fee of \$13,709.28 and a Preliminary Plan Application Fee of \$13,755. For the Final Site/Subdivision Application submission a fee of \$825 has been submitted separately from this application. The proposed project will develop two (2) new multi-family apartment buildings totaling 76-units utilizing the MSHA low-income housing tax credit program. One building will provide affordable non-age restricted housing units and the other will provide affordable senior housing units for those aged 55+.

Project Description

The parcel, located at 37 Barra Road, is currently owned by the City of Biddeford and is approximately 3.65-acres. The parcel is identified as Map 2, Lot 42 according to the City of Biddeford's Assessor's Maps. The subject lot was created and identified as Lot #1 in a City of Biddeford subdivision which was created in 1999 and received a MeDEP SLDA Permit¹ at that time. The subdivision was known as the Exit 4 Business Park and is now more frequently known as the Thatcher Brook Business Park. The site is within the I3 – Commercial Industrial Zone. Westbrook Development Corporation has requested a contract zone to build the proposed plan. A copy of the Option to Purchase Agreement is included in Attachment B.



Parcel Imagery from City GIS

¹ Reference Department Order #L-19832-39-A-N filed April 15th, 1999



STRUCTURAL



FALL PROTECTION
SAFETY



TRANSPORTATION



SITE DESIGN



SURVEY

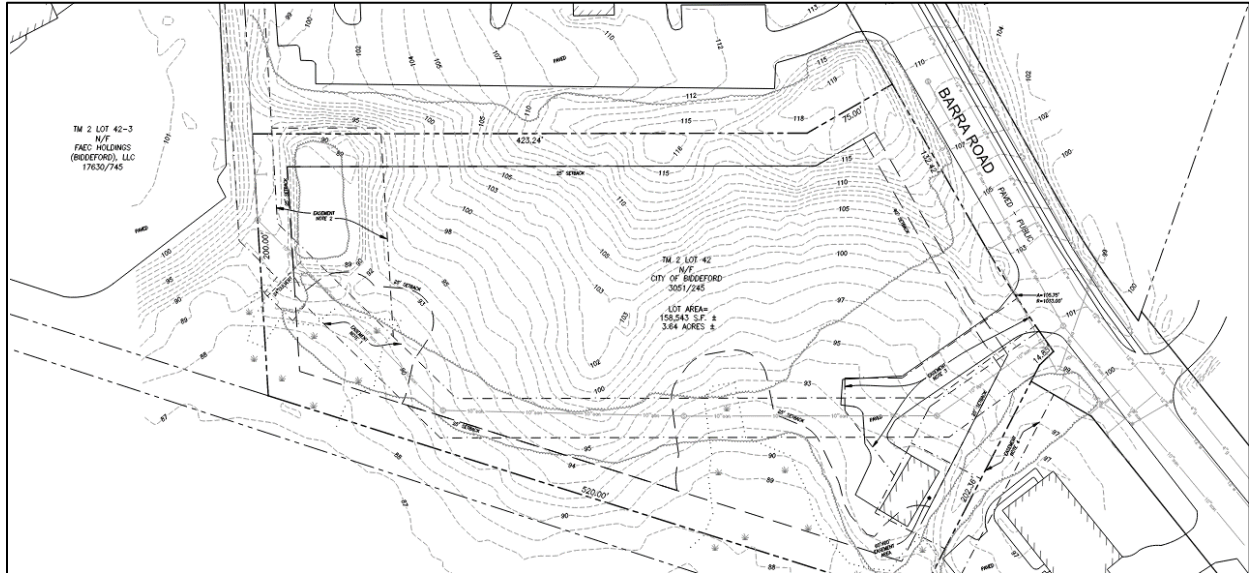


WATER
RESOURCES



TECHNOLOGY
Page 614 of 807

The property is bound to the north by the Holiday Inn, to the east by Barra Road, to the south by a doctor's office and an undeveloped field, and to the west by Southern Maine Healthcare. The property is partially developed with an existing 24' wide paved driveway providing access to a pump station structure operated by Maine Water Company in the southeast corner of the property. The City of Biddeford maintains a public sewer main which spans east-west through the property. An existing stormwater basin is located in the northwest corner of the property which is also maintained by the City of Biddeford. These facilities, and their respective easements, are identified on the survey plan.

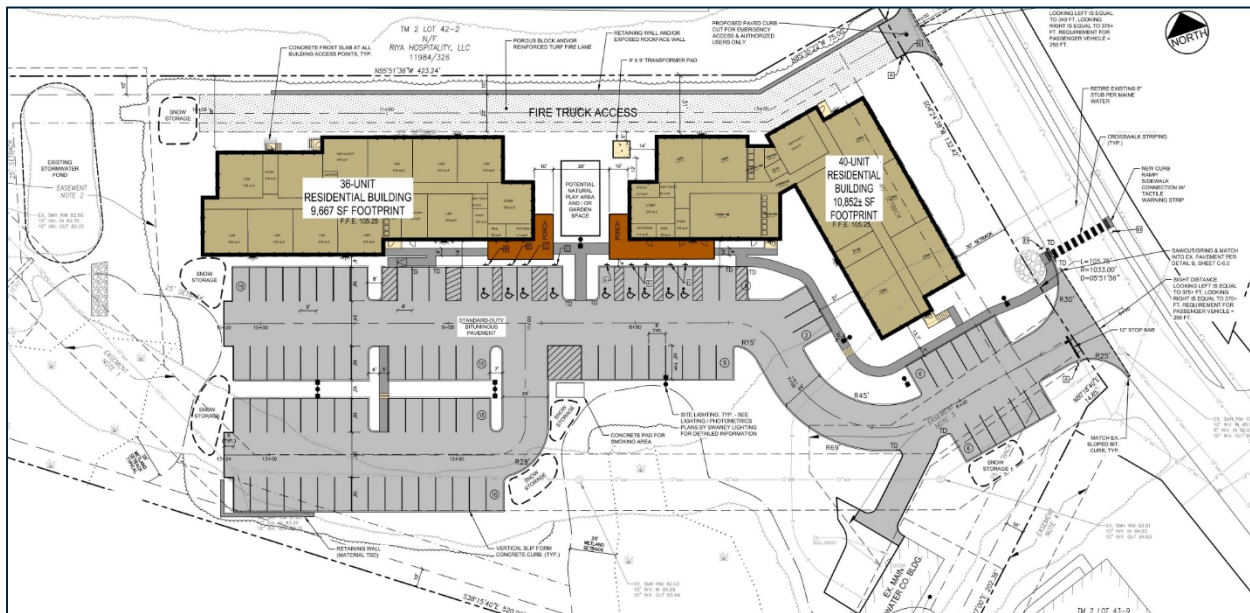


Survey Plan

An updated boundary and topographic survey was completed by Owen Haskell in May 2024 and updated wetland delineations were performed by Flycatcher in May 2024. Geotechnical explorations were performed in May 2024 by Summit Engineering. Topography across the site is rolling to steep with 5% to 15% grades and generally slopes from north to south towards the designated wetlands along the southern boundary. The north portion of the lot is vegetated with mixed growth including some trees and bushes. The center of the property is generally grass and bushes. Maintained lawn areas exist around the driveway, pump station building and along the sewer easement. The southern and eastern portions of the lot are wooded along the perimeter and contain wetland areas. In total, there is approximately +30' of elevation difference from the northeast portion of the site to the southwest portion of the site.

The project proposes to construct two (2) multi-family buildings totaling 76-units. Building #1 will be located closest to Barra Road and contain forty (40) affordable non-age restricted units. This building will be four stories tall with a 10,852SF footprint and generally have an L-shape footprint to run parallel with the north and east property boundaries. The unit distribution within Building #1 will be twenty (20) 1-bedroom units, twelve (12) 2-bedroom units, and eight (8) 3-bedroom units. Building #2 will be located westerly on the lot and contain thirty-six (36) affordable senior units which will all be 1-bedroom units. This building will be three stories with a 9,667SF footprint with a rectangular shape in line with the northerly leg of the Building #1 and running parallel with the northerly property boundary.

Access into the site will utilize a similar curb cut location and alignment to the existing driveway on the southeast portion of the Barra Road frontage. However, the driveway will be reestablished and regraded to accommodate the proposed site grades. The driveway will extend into the site and turn north before realigning with the buildings and running parallel with the northerly property boundary, running east west generally through the center of the site. The majority of parking will be located in front of the two buildings with a small parking area located at the south end of Building #1 near the front entrance. A new paved access will be provided for the Maine Water Company to their pump station facility along with an access gate to restrict access to authorized personnel. Along the northerly property boundary, a secondary curb cut will provide emergency and service vehicle access along the north sides of the buildings. This fire lane will be constructed with a reinforced turf material which consists of a gravel base with a LDPE panel which may be filled with loam and seed. This fire lane may also be used for other authorized service vehicles to access the utility services rooms located along the north side of the buildings. Each building will have main entrances emanating from 10' wide porches facing each other. The buildings will be spaced approximately 30' apart (between the porches) which will provide an opportunity for placemaking which may include a natural play area for children and/or a garden space. The buildings will have various egress points and other internal functions requiring exterior doors such as the mechanical rooms and internal trash rooms.



Site Plan Graphic

As previously described, the property has moderate slopes which have been accounted for in the current design. Additionally, shallow bedrock conditions exist in the north-central portion of the property. The buildings will be constructed with finished floor elevations at El. 105.25' which is generally situated in the middle of the existing grades on site. This approach seeks to balance cut and fill volumes. This includes cuts in the north of the property requiring steep slopes and/or retaining walls along the north property line and fill slopes and/or retaining walls off of the proposed parking area to the south; providing a level development footprint for the buildings and parking.

Site grades are also dependent on the stormwater management scheme for the property and ensure runoff can be captured and conveyed to the existing stormwater pond in the northwest end of the property. This property was identified as Lot #1 in a City of Biddeford subdivision which was the subject of a MeDEP SLDA permit in 1999. That permit identified development thresholds and drainage schemes for the proposed lots, including the subject lot. For the subject lot, the existing stormwater pond was designed to receive all runoff generated on site. Additionally, the total impervious surface/lot coverage was established in the permit as 48% (76,302SF) of the lot and 1,316SF of wetland impact (already executed with the road/frontage construction). The current site plan is within the previously permitted lot coverage and does not propose any further wetland impacts. Runoff generated on site will ultimately flow to the stormwater basin via a closed storm drain system consisting of catch basins located around the building in paved and landscaped areas which flow westerly to the basin. The stormwater basin was designed to provide flooding protection sufficient to reduce the peak discharge emanating from the site from the pre- to post-developed condition for a development which included 76,302SF of impervious surface and 95,396SF of developed surface. We conclude the peak discharge will be further reduced since the current site plan only proposes to construct 69,066SF of impervious surface and 35,062SF of landscaped area. Water quality treatment is also provided by the stormwater basin for total suspended solids treatment per the MeDEP water quality treatment standards which were applicable at the time of the original SLDA permit application. A stormwater management memo is provided in Attachment G which discusses these points further.

Public water, sewer, power, and natural gas are available at the project frontage along Barra Road and within the property. A new 8" private main water will extend into the site within the proposed fire lane along the north side of the buildings. A 4" domestic and 6" fire service will extend into each building from this main service line. A private hydrant will also be located in between the two buildings along the fire lane. Maine Water has provided an Ability to Serve capacity confirmation and is currently reviewing the water service design. Sewer services for each building will have separate connections to the public main on site. These sewer services will be required to flow through two drop structures to reach the existing sewer main. Three phase power is available at the project frontage where services will extend underground to a pad mount transformer that is located between the two buildings. Three phase power will then cross from the transformer pad to underneath the fire lane to the mechanical rooms for each building. Communications/telephone/fiber facilities will extend similarly underground from the nearest utility pole to the mechanical rooms along the north side of the buildings. Natural gas is located at the project frontage and is anticipated to be utilized in both buildings for hot water functions. An existing gas service extends into the site already for the Maine Water Company pump station building which will need to be reestablished. Utility outreach to the City Engineering Department and Maine Water Company is provided in Attachment D of this application.

We note that the Site Plan also demonstrates that the project may be built in one or more phases as dependent on availability of competitive funding from MaineHousing and other sources. To demonstrate the potential phasing scenarios, a phasing plan has been provided in the project plans which demonstrates the likely build-out in the event that one building is elected to be built first. In any scenario (built all at once or phased), it is anticipated that each building will be owned and financed separately by Thatcher Brook Apartments I and Thatcher Brook Apartments II respectively through a two (2) unit land condominium.

Site Plan Review Requirements

In accordance with § XI of the City of Biddeford's Land Development Regulations the following information is provided.

Site Design Criteria § XI-II.-5B

1. Drainage

- a. *The rate of post-development runoff shall not exceed that of predevelopment. Details of catch basins, drainage pipes and retention/detention ponds shall be provided as needed with the application. All detail sheets shall bear the seal and signature of a professional engineer, licensed in the State of Maine.*

As previously discussed, the subject lot was part of the Thatcher Brook Business Park which received an SLDA permit in 1999. That stormwater management plan proposed a stormwater basin (now constructed and existing in the northwest portion of the lot) which was intended to provide stormwater quality and quantity treatment solely for the subject lot.

- b. *A written engineering report describing the impacted watershed area, projected runoff, and any projected downstream impact shall be required.*

The project is within the Thatcher Brook watershed. A stormwater memorandum is provided in Attachment G which outlines the original stormwater design for the existing basin and the proposed impervious coverage to be built out on the property. We note that the stormwater basin was constructed as designed and the proposed site development contemplates less impervious and developed area than originally planned and, therefore, we anticipate the peak discharge rate for the development will be reduced as originally designed.

- c. *Drainage easements shall be established for any concentrated off-site drainage. Such easement shall state who has the responsibility to maintain the easement. Easement documents shall be reviewed, at applicant expense, by the Director of Public Works, City Engineer, and the City Solicitor, as to exactness of content. Plans shall include the location of easements.*

No new drainage easements are proposed as part of this effort.

- d. *Where it is determined by the City Engineer or consultant hired by the Board, that the additional runoff incident to the development of the projected site will overload an existing downstream drainage facility, the Board may require the provision of water-retarding facilities or other improvements to alleviate said problem.*

The existing stormwater basin will provide sufficient controls to reduce the peak discharge rate of the subject lot and will not have an adverse impact on the Thatcher Brook as a result.

- e. *Development in specific areas of concern shall provide detailed information and address specific issues in relation to drainage:*

1. *Parcels situated within the federally designated flood hazard zone, as per Flood Hazard Boundary Map H01-18, dated May, 1984, as amended, shall comply with all applicable federal regulations relating thereto.*
2. *One-hundred-year flood elevation line shall be included where applicable.*
3. *No slope shall be created which results in a slope of more than two feet horizontal to one foot vertical unless proper retaining walls are proposed.*

The project is not located in any special flood hazard areas or 100-year floodplain. Slopes on site which are steeper than 2:1 shall receive rip rap stabilization or are proposed as retaining walls.

- f. *Drainage improvements shall be scheduled to be constructed as part of the first portion of any project where drainage improvements are proposed.*

This requirement is understood by the Applicant.

- g. *Special bonding of 1 1/2 times the anticipated cost of said improvements shall be incorporated by the developer to insure that improvements are placed and that they function as planned. No portion of this special bond may be released until the project, or that portion of the project for which the drainage improvement is proposed has been constructed, and until so released by the Planning Board, with the recommendation from the Director of Public Works and the City Engineer.*

The Applicant will coordinate with the City Planning and Code Enforcement Department accordingly.

2. Utilities

- a. *All utilities, including electric, gas, water/sewer, shall be shown on the plat, and separate detail sheets as needed.*

The existing nearby utilities and proposed utility services are shown on the project plans.

- b. *Accessways, storage, and parking areas shall be graded and improved with pavements, curbs, gutters, sidewalks, storm drainage facilities, outdoor lighting, etc.*

The proposed site will include bituminous pavement with slipform concrete curbing in the driveway, drive aisle, and parking areas. A fire lane located along the north side of the buildings will include reinforced turf material.

- c. *All accessways/drives and service ways shall be of sufficient width and configuration to accommodate the prospective traffic and to afford satisfactory access to police, firefighting and other such services.*

The proposed driveway and parking drive aisles are 24' wide. The northerly fire lane is 20' wide.

We have met with and reviewed the current plans with the Fire Department. The current plans reflect their comments and we have included a fire truck turning template with this application in Attachment I.

- d. *Any proposal within 200 feet of a public water or sewer line(s) must connect to system(s). Applicant must supply copies of letters from the environmental specialist of the City of Biddeford for sewer, and water company shall confirm details of connection and/or concerns.*

The proposed project will utilize the public water and sewer services which are located at the project frontage. Ability to Serve letters provided by the City Sewer department and the Maine Water Company are located in Attachment D

- e. *Whether or not a municipal water system is proposed, the following items must be specified in application narrative and on plat:*

1. *Rated normal capacity and gallons per minute at prime use time.*

The anticipated daily flows are estimated to be 11,040 gpd based on a design flow of 120 gpd for single units and 90 gpd per bedroom for multibedroom units assuming (36) 1-bedroom senior units and (20) 1-bedroom, (12) 2-bedroom and (8) 3-bedroom family units.

2. *Rated maximum capacity and gallons per minute at prime use time.*

The anticipated peak daily flow is estimated to be approximately three times the average daily flow.

3. *Residual pressure of proposed tap line.*

The residual pressure of the proposed tap line is expected to be approximately 60 psi per the Ability to Serve Letter provided by Maine Water Company in Attachment D.

- f. *Where nondomestic sanitary discharge (any discharge into the public sewer system containing other than normal household wastes) is anticipated, such effluent shall be identified and comply with any and all federal, state, and local laws, ordinances, rules, and regulations. Where any such laws, ordinances, rules and regulations may overlap or may be inconsistent, the more stringent shall apply.*

The proposed sanitary sewer flow are anticipated to be normal household wastes.

- g. *Where public sanitary service is available, or where developers must extend such service, applicants must apply for and receive a discharge permit from the City Council of the City of Biddeford prior to approval by the Planning Board.*

A letter confirming the wastewater treatment capacity was received on July 17th from the City of Biddeford Engineering Department. This is attached with the other Utility Correspondence in Attachment D.

- h. Where practicable, all electrical and telephone utilities shall be placed underground.*

All electrical and telephone/communications/fiber services will extend to the proposed buildings underground. These services are proposed to extend into the site within the northerly fire lane.

3. Parking

- a. A parking plan shall delineate the number of parking and delivery or loading spaces and the physical arrangement. Details of parking plan shall conform to the provisions of the off-street parking section of Article VI of this Zoning Ordinance.*

The proposed parking spaces are shown on the project plans and comply with the typical parking stall and ADA parking stall dimensions. The proposed contract zone requires a parking ratio of 0.67 spaces per unit, however we are currently providing 95 parking spaces (1.25:1 ratio). Additionally, an alternative striping plan is provided on the Site Plan which demonstrates a parking layout providing additional accessible parking spaces for 27 vehicles requiring accommodation. The total parking provided in the alternative parking scenario is 87 spaces. This is a requirement of the funding application for MaineHousing to demonstrate additional accessible units may be provided.

- b. No on-street parking, delivery or loading is permitted, except where specifically allowed by the Planning Board.*

No on-street parking is proposed as part of this project.

- c. Whenever a use existing on the effective date of these regulations is changed thereafter to a new use, parking facilities and access shall be provided as required herein for such new uses.*

The project will create new parking spaces applicable to the proposed residential uses.

- d. In the case of multifamily projects the number of required parking spaces should be increased 5% to allow for visitor parking.*

The project is providing 95 parking spaces which is greater than the minimum identified in the contract zone language. As such, the project will provide 5% visitor spaces.

- e. Parking lots shall be landscaped and/or screened to provide for a pleasing visual effect and blending in with the surrounding area.*

The majority of the parking spaces will be provided in the center of the site set back from Barra Road. Landscaping within parking islands and at the perimeter of the parking areas will provide screening for surrounding properties.

- f. Lots shall be illuminated for security purposes. The lighting shall be designed in such a way that off-site glare is minimized.*

A photometrics plan is provided in the plan set and lighting cut sheets are provided in Attachment J. This plan demonstrates the project's ability to minimize site glare and spillover onto adjacent properties by utilizing full cut-off, downcasting fixtures. These include wall-mounted around the buildings to cover entrances and the fire lane as well as pole-mounted lights within the driveway and parking areas.

- g. Adequate space shall be allowed for the accumulation of snow during the winter plowing months.*

Snow storage areas are shown on the Site Plan.

4. Structural Layout and Design

- a. Design of buildings.*

- 1. Buildings shall be designed to blend harmoniously with the surrounding structures in the neighborhood. New structures should be designed so as to complement the style of the abutting older structures. A photograph, architectural rendering or other representation of the proposed structure must accompany the application for site review.*

The proposed buildings have been designed to blend in with the surrounding neighborhood and offer aesthetically pleasing elements commonly found in New England architectural vernacular. Floorplans and elevations are provided in Attachment E.

- 2. In the I-3 Zone structures shall have a facade sheath in brick or other masonry finish. Other facade finishes may be used when it can be clearly shown to the board that such facing material will advance the City's intent to make the I-3 area a more attractive gateway to the City.*

The contract zone language allows the Applicant to utilize different siding materials and does not strictly require the use of a brick or other style masonry to be utilized on the building façade.

- b. Setbacks. Proposed structures shall be set back from roadways, in conformance with requirements for the particular zone; and shall be set in such a way as to blend in harmoniously with buildings on abutting properties, and to allow for adequate landscaping of the front yard.*

The contract zone language establishes a 30' front and 10' side/rear building setback which blends in harmoniously with the surrounding neighborhood. This allows for sufficient landscaping in the front yard and perimeter areas. These setbacks are shown on the project plans.

- c. Fire protection.*

- 1. All proposed structures and additions to existing buildings must be designed to meet existing fire protection standards.*

Both structures will be designed per the latest local and state fire protection requirements.

2. *Fire hydrants and fire escapes must be clearly presented on plats.*

The buildings are designed with multiple stair towers/egress points around the buildings to meet the applicable life safety requirements.

3. *Clear ways around buildings must be maintained to provide for 360° access to structures.*

Clear ways are provided around the building which have been reviewed by the Fire Department.

4. *Areas in front of structures must be kept clear of parking spaces to allow for emergency access.*

Sufficient clear space is provided in front of structures to provide emergency vehicle access.

5. *Buildings should be designed with internal sprinkler systems. This is particularly the case in terms of multifamily and industrial/warehousing structures, and structures that will be located in areas that are far or difficult to reach from fire stations.*

Both buildings will be constructed with sprinkler systems.

6. *In residential developments of 24 units or more, or buildings of 5,000 square feet or more, a central alarm system to the central fire station shall be installed, unless a negative recommendation, in writing, is received from the Fire Marshal.*

The Applicant will coordinate with the Fire Department to confirm the applicability of a central alarm system.

7. *In residential developments of 24 dwelling units or more, or office buildings with more than two separate establishments or places of business, a "knock box" shall be provided and indicated on plat. This box shall be in accordance with the specifications and standards as prescribed by the Fire Department of the City of Biddeford.*

The Applicant will coordinate with the Fire Department for the final location of a Knox Box for fire department access to the buildings as necessary.

8. *Whenever gas, either natural or propane or other type, is proposed to be used on-site, a separate external shutoff valve shall be provided for each building on the site. The valve location shall be indicated on the plat and approved in writing by the fire chief/fire marshal.*

The Site Plans identify a potential natural gas service alignment for each building, however, the service entry and shutoff valve location has not been finalized since an MEP designer has not been enlisted to complete the internal plumbing design. The final location of the service shut off valves will be coordinated with the Fire Department at the time of the Building Permit application.

d. *Landscaping.*

1. *All sites must be landscaped with vegetation that will act to:*

- (a) Reduce the impact of lighting, vehicular and structural, on abutting properties;*
- (b) Reduce the impact of proposed structures on the privacy of abutters;*
- (c) Make the site more attractive to the average viewer.*

The planting plan provides sufficient screening for the parking area and to abutting properties. Perimeter tree plantings will address the scale of the buildings and soften the view from the public way. The tree plantings along the road frontage will also continue the row of trees existing along the opposite side of Barra Road currently.

2. *Landscaping measures will be indicated on the plat by drawings and narrative note. The use of trees and shrubs for fencing and shading is strongly encouraged. Care must be taken to ensure that tree, etc., are placed in such a fashion that in time they will cause minimum impact on abutting properties and public roadways and travelways, particularly as they grow.*

The proposed detailed landscaping plan provided addresses placement of trees, perennials, shrubs and screen fencing to enhance the site while minimizing impacts to abutting properties, public roadways, and travelways. The design addresses the lifespan of the specified vegetation. Understory trees and canopy trees along with shrubs specified for parking improvements screening and travelways have been quantified on the plans. Perennials, wildflower beds and the interior courtyard areas will be finalized during the construction documentation phase.

3. *Whenever possible existing vegetation shall be preserved and incorporated into the landscaping scheme of the project.*

Much of the existing site sits as dry meadow, wetlands, and woody vegetation with perimeter trees along the lot boundaries. Along the southern edge the existing tree canopy will go mostly untouched providing a healthy existing tree canopy. The northern lot boundary will have a retaining wall and vine plantings- Efforts have been made to retain as much of the existing vegetation as possible behind the retaining wall but the removal of some mature pine trees and one cherry tree (8"+) along the proposed wall will be necessary. A vegetation management exhibit is provided in Attachment L.

4. *Each proposal will include a detailed landscaping plan. This plan will include the location, type and size of existing mature trees (those trees over eight inches in diameter).*

A thoughtful planting approach has been taken to offsetting visual impacts of the new structures. Canopy trees address the scale of the structure along Barra Road and wildflower seed mix has been specified to along the Barra Road frontage to naturalize the area creating an interesting/native planting palette for the site. The buildings fit well into the design trend of the neighborhood.

5. *Particular attention should be paid to offsetting the visual impact of new structures in areas where there may be a stark contrast with the existing design trend of the neighborhood.*

The buffer/screening areas including the front yard area and around the perimeter of the parking area have been planted to provide sufficient screening as requested. This is shown on the landscape plan provided in the project plans.

e. Service, storage and utility areas.

1. *All service, storage, and utility areas shall be designed to the side or rear yard of a proposed or existing building or structure, and such areas shall be appropriately screened/buffered by walls, fences, earth berms, or vegetation.*

The northerly fire lane will contain underground utilities, a private hydrant, and a padmount transformer. These utilities will be screened as much as possible while allowing sufficient access for servicing/use. Water and electrical meters as well as trash bins will be located interior to the building and not visible from the outside.

2. *Proposed utility elements shall be adequately screened; and, if producing sound, baffled upon Planning Board request.*

See response above.

3. *Trash receptacles, dumpsters, storage sheds, etc., shall be shown on plat.*

Trash bins are located internal to the building and, therefore, no exterior trash storage is provided.

f. Paving, parking, and storage areas.

1. *No paving, parking, or storage shall be permitted within the required setback of any side or rear property line;*

The contract zone language provides a 0' setback for paving/parking/fire lanes. This is necessary to provide sufficient parking and fire lane access while avoiding excessive impacts to natural site features such as the southerly wetlands. Currently, the southwest corner of the parking area is located 8.9' from the southerly property line which is adjacent an undeveloped property. All other parking is located 20' from any property line.

2. *No paving, parking, or storage (except for entrances/exits) shall be permitted within 25 feet of any front property line. These unpaved nonparking or nonstorage areas shall be maintained as landscaped areas or open spaces.*

The parking provided on site is located greater than 20' away from the front property line.

g. Handicapped accessibility.

1. *Pedestrian walkways, entrances and exits designed for use by the handicapped shall be provided as required by any and all federal, state, or local laws, ordinances, rules and regulations or as requested by the Planning Board.*

The project includes 4 accessible parking spaces for the senior building and 5 spaces for the family building. This is well above what would typically be required for minimum ADA parking space requirements and reflects the accessible apartment units the Applicant is pledging to construct as part of the MaineHousing (MSHA) Low Income Housing Tax Credit (LIHTC) program. To meet MSHA funding requirements, an additional 18 accessible spaces are demonstrated as a possible future parking scenario on the Site Plans should the Applicant seek to pledge additional accessible units within the buildings. Sufficient access is provided from the parking areas into the main entrance of the buildings along the designated ADA route.

2. *Handicapped parking spaces and accessways shall be indicated on plat whenever they are to be employed.*

The accessible parking spaces discussed above are shown on the project plans and Site/Subdivision Plan.

h. Loading facilities.

1. *Loading facilities for new structures shall be designed to the rear or side of any and all proposed or existing building or structure.*

Not applicable.

2. *Loading facilities shall be designed in accordance with the applicable federal, state, or local laws, ordinances, codes, rules and regulations and shall be off-street or accessible via a public street.*

Not applicable.

i. Parking, loading, and protective buffers.

1. *All parking, loading and protective buffers shall be situated on the same tract or parcel of land as the primary use building or structure.*

All parking, loading and buffers are located on the subject parcel as necessary.

2. *The maximum nonvegetated area of the land area being developed and reviewed shall be 75%.*

The proposed nonvegetated area is 56% of the total lot area.

3. *Any parking or paving, including all access ways, egress ways, entrances and exits on streets for both pedestrian and vehicular use, shall not cover or occupy more than 30% of the land*

area being developed and reviewed and shall be included with the maximum nonvegetated area.

The proposed parking/pavement area for the project total is 26% of the total lot area.

4. *In all applications, a minimum of 25% of the land area being developed and reviewed shall remain in its natural state or shall be maintained as appropriately landscaped area.*

The existing land area not to be disturbed is 32% of the total lot area.

5. *All buildings or structures shall be sited in conformance with established setbacks of the particular zone. No building or structure may be built within the required side yard setback. The Planning Board may require greater setbacks in areas such as turnpikes, water bodies, railroads, etc.*

The proposed buildings have been located on the property within the applicable setbacks established as part of the contract zone.

6. *All buffered or screened areas shall be densely planted with shrubs or trees which are respectively at least two or three feet high at the time of planting and are of a type which may be expected to form a year-round dense screen of at least five feet high within three years, provided that such screening shall not obstruct the view of oncoming traffic when entering or exiting the site. An additional cash bond to cover the cost of replacement of these plantings may be required. The term of the bond shall be equal to three years from the time of planting. At the end of the three years any unused portion of this security will be returned to the applicant along with accrued interest.*

The buffer/screening areas including the front yard area and around the perimeter of the parking area have been planted to provide sufficient screening as requested. This is shown on the landscape plan provided in the project plans.

j. Open space.

1. *In new residential developments: Open space shall be provided in the ratio of 1,000 square feet for each dwelling unit. This open space shall be identified as either a "green space" or as "recreational space."*

The contract zone language identifies an open space ratio of 250SF per unit. Based on the density afforded, 76 units would typically require 76,000SF of open space area which is not feasible on this site while also balancing the required driveway, parking, and emergency access. We note that green space will be provided on site for residents of both buildings around the site including an active porch area which will appeal to residents of all ages. Additionally, the Eastern Trail is located a short distance away on Barra Road.

2. *Whenever practicable, open space in a residential development shall include a mixture of active and passive recreational opportunities to benefit the various residents of the project. Such opportunities would include, but are not limited to, ball and other playing fields, tennis*

courts, etc.

The current plans include exterior recreational opportunities including front porches and a natural play/garden area in between the two buildings. These spaces will include chairs, benches, and bike racks.

3. *In large-scale projects hiking trails or nature paths are encouraged.*

The project is located a short distance away from the Eastern Trail which connects to Barra Road.

4. *In projects that abut rivers or streams a public easement is encouraged, to provide access to a limited natural resource.*

Not applicable.

5. *The plan shall reflect the natural capabilities of the site to support development. Buildings, lots, and support facilities will be clustered in those portions of the site that have the most suitable conditions for development. Environmentally sensitive areas, including but not limited to wetlands, steep slopes, floodplains, significant wildlife habitats, fisheries, scenic areas, habitat for rare and endangered plants and animals, unique natural communities and natural areas, and sand and gravel aquifers will be maintained and preserved to the maximum extent. The development shall include appropriate measures for protecting these resources, including but not limited to modification of the proposed design of the site, timing of construction, and limiting the extent of excavation.*

The site layout and grading for the development leverages the existing topography and southerly exposure of the lot. Buildings are situated along the northerly property boundary on higher elevations than parking areas. Southerly on the lot there are mapped wetland areas which the site layout is careful to avoid and maintain vegetated buffers. There are no other sensitive natural resources which would require further avoidance.

k. *External lighting.*

1. *All existing/proposed external lighting must be included on plat. Lighting will be described as needed.*

Existing and proposed lighting locations are provided in the project plans.

2. *Lighting shall be designed to provide adequate illumination on-site, especially in parking areas, walkways and structural entrances, and site entrance from roadways. At the same time all illumination will be designed to mitigate adverse impact on abutting properties and structures, and traffic.*

A photometrics plan is provided in the project plans. Lighting fixture cuts sheets are provided in Attachment J which provides sufficient lighting for the parking areas and building entrances.

l. Signs.

1. *All proposed signs shall meet standards provided in Article VI of the Zoning Ordinance of the City of Biddeford.*

The buildings may include address numbers on each building, facing Barra Road. Currently, no other signs are proposed for the buildings. These addresses would be placed on the building in accordance with the applicable City Code.

2. *Signs shall be indicated on plat.*

No freestanding signs are proposed on the project site. It is anticipated that building mounted lettering/signage will be utilized to display the project addresses which will be coordinated with the Planning Department and/or Code Enforcement.

3. *A detail of sign design shall be submitted as part of the application for site review.*

We would request that the final signage be provided as a condition of approval prior to issuance of a building permit for each building to allow sufficient design for these final details.

- m. Historic and archaeological resources. If any portion of the site has been identified as containing historic or archaeological resources, the development shall include appropriate measures for protecting these resources, including but not limited to modification of the proposed design of the site, timing of construction, and limiting the extent of construction.*

As part of the original SLDA permit process for the business park, historical and archeological review was undertaken for the entire subdivision and, ultimately, no significant resources were identified within the subject lot and/or the subdivision.

Subdivision Review Requirements

In accordance with § 66-39 *Board action on approval of preliminary plan* of the City of Biddeford's Code of Ordinances, the following information is provided.

Required Information § 66-35(d)

(d) In addition to the above plat information, the subdivider shall provide the following documents;

- (1) Valid deed or option indicating an interest held by the subdivider in the parcel of land (this shall be kept current during the review process).*

A copy of the deed for the subject parcel is provided in Attachment B.

- (2) Completed application form.*

The completed application form is provided in Attachment A.

- (3) *Narrative of the proposed project briefly describing the general nature of the project, i.e., type of project; residential or commercial; number of lots intended to create.*

A narrative describing the project is provided at the beginning of this application letter.

- (4) *Draft covenants and deeds for each lot proposed.*

The subdivision review requirements are applicable to the multifamily aspect of the development and are not a part of a multi-lot split. However, it is anticipated that the Applicant will declare a land condominium comprised of two units - one condominium unit for each building. The purpose of the condominium is to allow for separate financing of each building – one by each applicant entity. However, control of the development will remain Westbrook Development Corporation which serves as the sole member of the Applicant's general partner entity, WDC GP, LLC. Final condominium documentation will be provided, if required by the Planning Board.

- (5) *Easement documents for proposed rights-of-way for utilities, drainageways, roadways and other travelways or public amenities.*

In the event condominium ownership structure is utilized, cross easements and common elements will be established for driveway access, utilities, drainage and parking, between the two buildings will be described in the condominium documentation.

- (6) *Statement of financial capability of subdivider to undertake the proposed project.*

A financial capacity letter is provided in Attachment C of this application.

- (7) *Statement identifying principals involved in the project.*

A company profile and personnel profiles are provided as Technical Capacity evidence in Attachment C for the Westbrook Development Team. Additionally, the design team currently includes:

- Project Architect – Kaplan Thompson Architects
 - Jesse Thompson, FAIA, LEED AP, CPHC
 - Selomi Nganga
- Project Engineer – Gorrill Palmer
 - Kaleb Bourassa, PE
- Project Landscape Architect – DRY Landscape Architecture
 - Braden Drypolcher, RLA

- (8) *Statement demonstrating that the subdividers have the technical capability to complete the proposed project as presented.*

Evidence of Technical Capacity is provided in Attachment C.

(9) Copies of such covenants or deed restrictions as are intended to all or part of the tract.

The property is the subject of a MaineDEP SLDA/NRPA permit under Permit Order #L-19832-AN-BN which was approved in April 1999 for the Thatcher Brook Business Park. That permit approval required deed restrictions be conveyed to buyers/lessees of individual lots restricting the conveyance subject to the terms and conditions of the permit. Additionally, a signed and dated statement from the subject lot buyer should be kept on file by the City acknowledging the terms and conditions of the Permit. The City of Biddeford created a Declaration of Covenants, Conditions, and Restrictions for Exit 4 Business Park (now Thatcher Brook Business Park) which includes the same deed restrictions and business park standards to comply with the Original Permit. The Applicant is coordinating with the City Council and Staff to release the deed restrictions/covenants regarding residential use and project design on the property.

(10) Review by water company, power company and City Engineering, police, and fire department.

We have reached out to the Maine Water Company, City Engineering, and police and fire departments for review. Confirmation of capacity to serve has been received from Maine Water and City Engineering for water usage and wastewater capacity, respectively. We understand the Fire Department is satisfied with the site planning for emergency access and no further comments are anticipated. We await final approval from the police department.

Conditions and Requirements § 66-39(b)

(b) The Board shall base its decision on the plans meeting the conditions and requirements outlined in this chapter; and that the plan meets in a positive fashion, the following:

(1) The project will not result in undue water or air pollution. In making this determination the Board shall consider:

- a. The elevation land, and its relation to the floodplains;*
- b. The nature of the soils and the subsoils;*
- c. The ability to adequately support waste disposal;*
- d. The slope of the land and its effects on effluents;*
- e. The availability of streams for the disposal of effluents; and*
- f. The applicable state and local health and water resources regulations.*

The project is a residential development and will not cause undue air or water pollution.

(2) The project has sufficient water available for the reasonably foreseeable needs of the subdivision;

The project will be served by public water emanating from Barra Road. Domestic and fire services will extend into both buildings.

(3) The project will not cause an unreasonable burden on an existing water supply, if one is utilized;

The Maine Water Company has confirmed sufficient capacity to serve the proposed 76-unit residential development. The Ability to Serve letter is provided in Attachment D.

- (4) The project will not cause unreasonable soil erosion or reduction in the capacity of the land to hold water so that a dangerous or unhealthy, condition may result;*

The proposed site improvements will include buildings, pavement, reinforced turf, and landscaped area, among other surfaces, which will remain stabilized post-construction. No unreasonable soil erosion or dangerous conditions will be created as a result of this project.

- (5) The project will not cause unreasonable highway or public road congestion or unsafe conditions with respect to use of the highways or public roads existing or proposed;*

The project is proposed to create 39 peak hour trip ends which is not anticipated to cause unsafe traffic conditions on Barra Road and the adjacent street systems. A traffic memo is provided in Attachment H which demonstrates the trip generation and driveway safety review.

- (6) The project will provide for adequate sewage waste disposal.*

The project will utilize the public sewer system which flows cross-country through the subject parcel.

- (7) The project will not cause unreasonable burden on the ability of the municipality to disposal of solid waste and sewage if municipal services are to be utilized;*

The development will utilize a private trash collection vendor to handle solid waste generated. The development will not cause an unreasonable burden on the municipality to provide sewage treatment.

- (8) The project will not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites, or rare and irreplaceable natural areas or public rights for physical or visual access to the shoreline. Further, the plan shall reflect the natural capabilities of the site to support development. Buildings, lots, and support facilities will be clustered in those portions of the site that have the most suitable conditions for development. Environmentally sensitive areas, including but not limited to wetlands, steep slopes, floodplains, significant wildlife habitats, fisheries, scenic areas, habitat for rare and endangered plants and animals, unique natural communities and natural areas, and sand and gravel aquifers will be maintained and preserved to the maximum extent. The development shall include appropriate measures for protecting these resources, including but not limited to modification of the proposed design of the site, timing of construction, and limiting the extent of excavation;*

The project will not have an undue effect on the scenic character of the area. The project will utilize a natural color pallet and locate buildings set back from the Barra Road sufficient to provide buffering in the front yard area and around the perimeter of the development.

- (9) The project is in conformance with a duly adopted subdivision regulation or ordinance, Comprehensive Plan, development plan, or land use plan, if any. In making this determination*

the Board is authorized to interpret these ordinances and plans;

The project is in line with the recent Comprehensive Plan which was completed in 2023. That plan outlined the rising cost for housing and the need for additional housing within the community.

(10)The subdivider has adequate financial and technical capacity to meet the above stated standards;

Evidence of financial and technical capacity has been provided in Attachment C. The financial capacity letter is from Gorham Savings Bank.

(11)Whenever situated, in whole or in part, within 250 feet of any lake, pond, river or tidal waters, the project will not adversely affect the quality of that body of water, or unreasonably affect the shoreline of that body of water, as indicated on the City of Biddeford, Official Zoning Map and referenced in the City's Comprehensive Plan;

The project is not located within 250' of any lake, pond, river or tidal waters.

(12) The project will not, alone or in conjunction with existing activities, adversely affect the quality or quantity of ground water.

The project has been designed and will continue to operate as originally intended in the stormwater management plan which was approved for the Thatcher Brook Business Park as approved by the MeDEP and City of Biddeford.

(13)The subdivider will provide information, based on FEMA flood boundary, floodway, and flood insurance maps, whether or not the project is in a flood prone area;

The project is not located within the FEMA flood boundary, floodway, or flood insurance maps.

(14)The project will not unreasonably obstruct abutting properties or structures access to direct sunlight;

The project will not obstruct abutting properties access to sunlight as it is lower in elevation and separated a sufficient distance from the nearest structure.

(15)If any portion of the site has been identified as containing historic or archaeological resources, the development shall include appropriate measures for protecting these resources, including but not limited to modification of the proposed design of the site, timing of construction, and limiting the extent of construction.

No portion of the site has been identified as containing historic or archeological resources as concluded in previous local and state review efforts for the business park.

Closure

The Project Team looks forward to the Department's review of application. If you have any questions with regards to the submission material or need additional copies, please contact our office.

Sincerely,



Kaleb Bourassa, PE

Project Manager

Phone 207-772-2515 x297

KBourassa@GorrillPalmer.com

Attachments:

- A – Planning Board Application, Agent Authorization
- B – Title, Right & Interest
- C – Financial and Technical Capacity
- D – Utility Correspondence
- E – Architectural Renderings/Drawings of Proposed Buildings
- F – Site Photos
- G – Stormwater Management Memo
- H – Traffic Report
- I – Fire Truck Turning Movements
- J – Lighting Fixture Cut Sheets
- K – Engineer's Opinion of Cost
- L – Vegetation Management Exhibit
- Site Plans

c: Tyler Norod, Westbrook Development Corporation (WDC)
Maggie Stanley, WDC
Jesse Thompson, Kaplan Thompson Architects

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July 17, 2024

Mr. David Galbraith, City Planner

City of Biddeford
205 Main Street
Biddeford, ME 04005

**Subject: Preliminary Site Plan and Subdivision Application
Thatcher Brook Apartments I & II
Tax Map 2, Lot 42 – Biddeford, ME**

Dear Mr. Galbraith:

On behalf of **Westbrook Development Corporation (Developer), Thatcher Brook Apartments I, LP (Owner), and Thatcher Brook Apartments II, LP (Owner)**, Gorrill Palmer is pleased to make this Final Site Plan and Subdivision submission for the proposed 76-unit multi-family residential development project at 37 Barra Road, Biddeford, ME. Gorrill-Palmer has been retained and authorized by the Applicant to perform all work necessary to submit this application. An initial Sketch Plan submission was made in May 2024 and reviewed at the June 5th, 2024, Planning Board meeting. Fees which have been submitted to date by the Applicant include a Sketch Plan Application Fee of \$13,709.28 and a Preliminary Plan Application Fee of \$13,755. For the Final Site/Subdivision Application submission a fee of \$825 has been submitted separately from this application. The proposed project will develop two (2) new multi-family apartment buildings totaling 76-units utilizing the MSHA low-income housing tax credit program. One building will provide affordable non-age restricted housing units and the other will provide affordable senior housing units for those aged 55+.

Project Description

The parcel, located at 37 Barra Road, is currently owned by the City of Biddeford and is approximately 3.65-acres. The parcel is identified as Map 2, Lot 42 according to the City of Biddeford's Assessor's Maps. The subject lot was created and identified as Lot #1 in a City of Biddeford subdivision which was created in 1999 and received a MeDEP SLDA Permit¹ at that time. The subdivision was known as the Exit 4 Business Park and is now more frequently known as the Thatcher Brook Business Park. The site is within the I3 – Commercial Industrial Zone. Westbrook Development Corporation has requested a contract zone to build the proposed plan. A copy of the Option to Purchase Agreement is included in Attachment B.



Parcel Imagery from City GIS

¹ Reference Department Order #L-19832-39-A-N filed April 15th, 1999



STRUCTURAL



FALL PROTECTION
SAFETY



TRANSPORTATION



SITE DESIGN



SURVEY

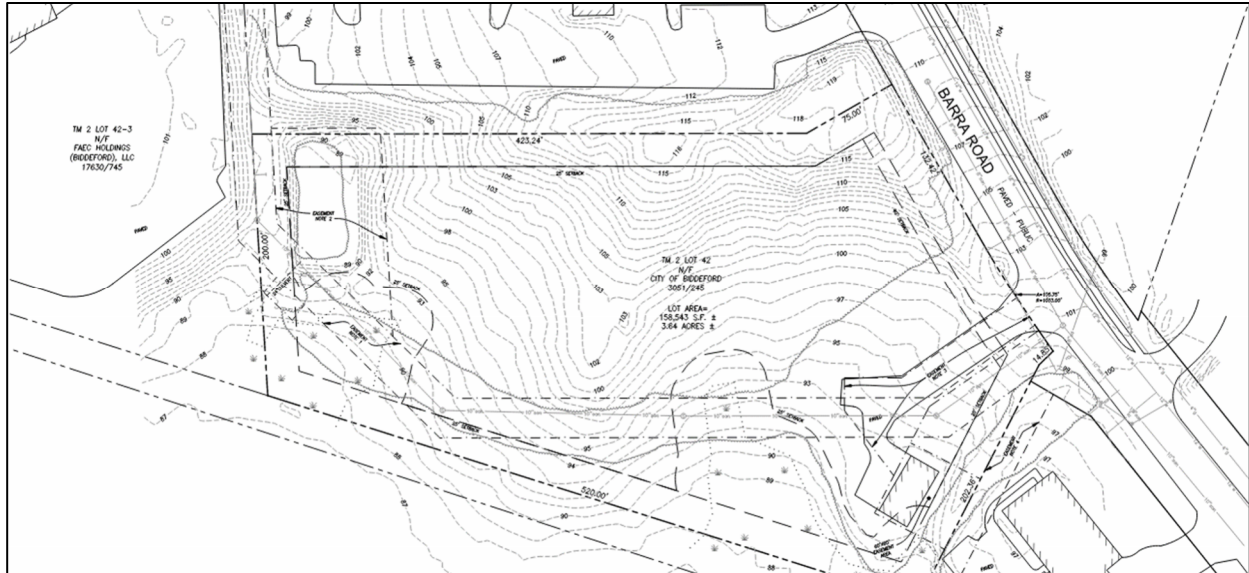


WATER
RESOURCES



TECHNOLOGY
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The property is bound to the north by the Holiday Inn, to the east by Barra Road, to the south by a doctor's office and an undeveloped field, and to the west by Southern Maine Healthcare. The property is partially developed with an existing 24' wide paved driveway providing access to a pump station structure operated by Maine Water Company in the southeast corner of the property. The City of Biddeford maintains a public sewer main which spans east-west through the property. An existing stormwater basin is located in the northwest corner of the property which is also maintained by the City of Biddeford. These facilities, and their respective easements, are identified on the survey plan.

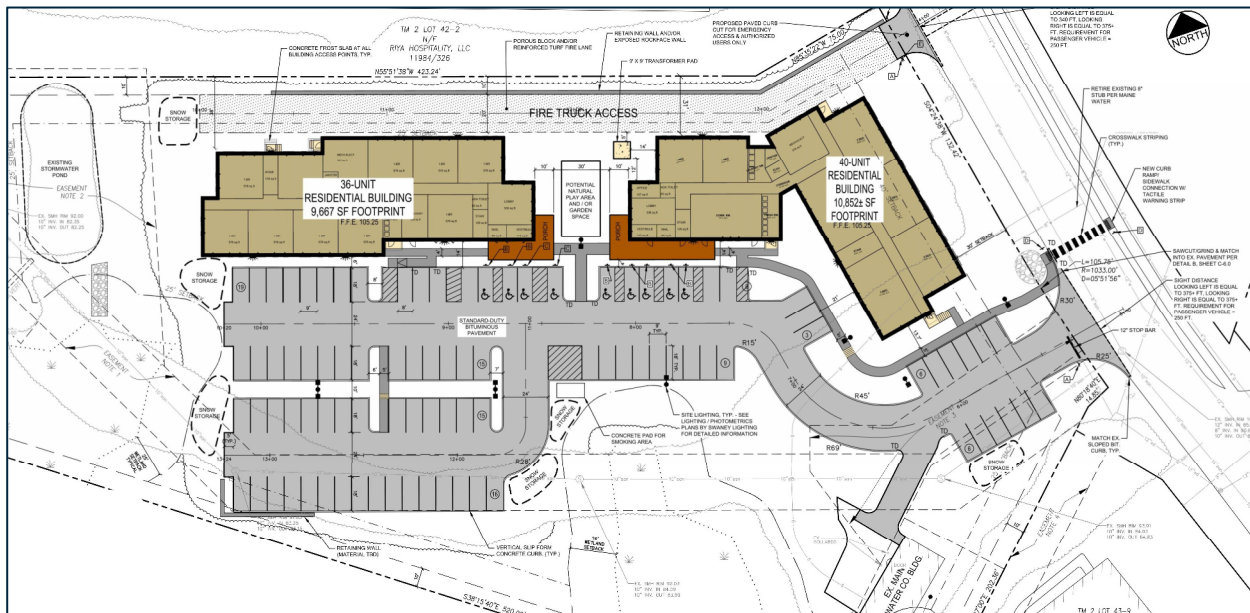


Survey Plan

An updated boundary and topographic survey was completed by Owen Haskell in May 2024 and updated wetland delineations were performed by Flycatcher in May 2024. Geotechnical explorations were performed in May 2024 by Summit Engineering. Topography across the site is rolling to steep with 5% to 15% grades and generally slopes from north to south towards the designated wetlands along the southern boundary. The north portion of the lot is vegetated with mixed growth including some trees and bushes. The center of the property is generally grass and bushes. Maintained lawn areas exist around the driveway, pump station building and along the sewer easement. The southern and eastern portions of the lot are wooded along the perimeter and contain wetland areas. In total, there is approximately +30' of elevation difference from the northeast portion of the site to the southwest portion of the site.

The project proposes to construct two (2) multi-family buildings totaling 76-units. Building #1 will be located closest to Barra Road and contain forty (40) affordable non-age restricted units. This building will be four stories tall with a 10,852SF footprint and generally have an L-shape footprint to run parallel with the north and east property boundaries. The unit distribution within Building #1 will be twenty (20) 1-bedroom units, twelve (12) 2-bedroom units, and eight (8) 3-bedroom units. Building #2 will be located westerly on the lot and contain thirty-six (36) affordable senior units which will all be 1-bedroom units. This building will be three stories with a 9,667SF footprint with a rectangular shape in line with the northerly leg of the Building #1 and running parallel with the northerly property boundary.

Access into the site will utilize a similar curb cut location and alignment to the existing driveway on the southeast portion of the Barra Road frontage. However, the driveway will be reestablished and regraded to accommodate the proposed site grades. The driveway will extend into the site and turn north before realigning with the buildings and running parallel with the northerly property boundary, running east west generally through the center of the site. The majority of parking will be located in front of the two buildings with a small parking area located at the south end of Building #1 near the front entrance. A new paved access will be provided for the Maine Water Company to their pump station facility along with an access gate to restrict access to authorized personnel. Along the northerly property boundary, a secondary curb cut will provide emergency and service vehicle access along the north sides of the buildings. This fire lane will be constructed with a reinforced turf material which consists of a gravel base with a LDPE panel which may be filled with loam and seed. This fire lane may also be used for other authorized service vehicles to access the utility services rooms located along the north side of the buildings. Each building will have main entrances emanating from 10' wide porches facing each other. The buildings will be spaced approximately 30' apart (between the porches) which will provide an opportunity for placemaking which may include a natural play area for children and/or a garden space. The buildings will have various egress points and other internal functions requiring exterior doors such as the mechanical rooms and internal trash rooms.



Site Plan Graphic

As previously described, the property has moderate slopes which have been accounted for in the current design. Additionally, shallow bedrock conditions exist in the north-central portion of the property. The buildings will be constructed with finished floor elevations at El. 105.25' which is generally situated in the middle of the existing grades on site. This approach seeks to balance cut and fill volumes. This includes cuts in the north of the property requiring steep slopes and/or retaining walls along the north property line and fill slopes and/or retaining walls off of the proposed parking area to the south; providing a level development footprint for the buildings and parking.

Site grades are also dependent on the stormwater management scheme for the property and ensure runoff can be captured and conveyed to the existing stormwater pond in the northwest end of the property. This property was identified as Lot #1 in a City of Biddeford subdivision which was the subject of a MeDEP SLDA permit in 1999. That permit identified development thresholds and drainage schemes for the proposed lots, including the subject lot. For the subject lot, the existing stormwater pond was designed to receive all runoff generated on site. Additionally, the total impervious surface/lot coverage was established in the permit as 48% (76,302SF) of the lot and 1,316SF of wetland impact (already executed with the road/frontage construction). The current site plan is within the previously permitted lot coverage and does not propose any further wetland impacts. Runoff generated on site will ultimately flow to the stormwater basin via a closed storm drain system consisting of catch basins located around the building in paved and landscaped areas which flow westerly to the basin. The stormwater basin was designed to provide flooding protection sufficient to reduce the peak discharge emanating from the site from the pre- to post-developed condition for a development which included 76,302SF of impervious surface and 95,396SF of developed surface. We conclude the peak discharge will be further reduced since the current site plan only proposes to construct 69,066SF of impervious surface and 35,062SF of landscaped area. Water quality treatment is also provided by the stormwater basin for total suspended solids treatment per the MeDEP water quality treatment standards which were applicable at the time of the original SLDA permit application. A stormwater management memo is provided in Attachment G which discusses these points further.

Public water, sewer, power, and natural gas are available at the project frontage along Barra Road and within the property. A new 8" private main water will extend into the site within the proposed fire lane along the north side of the buildings. A 4" domestic and 6" fire service will extend into each building from this main service line. A private hydrant will also be located in between the two buildings along the fire lane. Maine Water has provided an Ability to Serve capacity confirmation and is currently reviewing the water service design. Sewer services for each building will have separate connections to the public main on site. These sewer services will be required to flow through two drop structures to reach the existing sewer main. Three phase power is available at the project frontage where services will extend underground to a pad mount transformer that is located between the two buildings. Three phase power will then cross from the transformer pad to underneath the fire lane to the mechanical rooms for each building. Communications/telephone/fiber facilities will extend similarly underground from the nearest utility pole to the mechanical rooms along the north side of the buildings. Natural gas is located at the project frontage and is anticipated to be utilized in both buildings for hot water functions. An existing gas service extends into the site already for the Maine Water Company pump station building which will need to be reestablished. Utility outreach to the City Engineering Department and Maine Water Company is provided in Attachment D of this application.

We note that the Site Plan also demonstrates that the project may be built in one or more phases as dependent on availability of competitive funding from MaineHousing and other sources. To demonstrate the potential phasing scenarios, a phasing plan has been provided in the project plans which demonstrates the likely build-out in the event that one building is elected to be built first. In any scenario (built all at once or phased), it is anticipated that each building will be owned and financed separately by Thatcher Brook Apartments I and Thatcher Brook Apartments II respectively through a two (2) unit land condominium.

Site Plan Review Requirements

In accordance with § XI of the City of Biddeford's Land Development Regulations the following information is provided.

Site Design Criteria § XI-II.-5B

1. Drainage

- a. *The rate of post-development runoff shall not exceed that of predevelopment. Details of catch basins, drainage pipes and retention/detention ponds shall be provided as needed with the application. All detail sheets shall bear the seal and signature of a professional engineer, licensed in the State of Maine.*

As previously discussed, the subject lot was part of the Thatcher Brook Business Park which received an SLDA permit in 1999. That stormwater management plan proposed a stormwater basin (now constructed and existing in the northwest portion of the lot) which was intended to provide stormwater quality and quantity treatment solely for the subject lot.

- b. *A written engineering report describing the impacted watershed area, projected runoff, and any projected downstream impact shall be required.*

The project is within the Thatcher Brook watershed. A stormwater memorandum is provided in Attachment G which outlines the original stormwater design for the existing basin and the proposed impervious coverage to be built out on the property. We note that the stormwater basin was constructed as designed and the proposed site development contemplates less impervious and developed area than originally planned and, therefore, we anticipate the peak discharge rate for the development will be reduced as originally designed.

- c. *Drainage easements shall be established for any concentrated off-site drainage. Such easement shall state who has the responsibility to maintain the easement. Easement documents shall be reviewed, at applicant expense, by the Director of Public Works, City Engineer, and the City Solicitor, as to exactness of content. Plans shall include the location of easements.*

No new drainage easements are proposed as part of this effort.

- d. *Where it is determined by the City Engineer or consultant hired by the Board, that the additional runoff incident to the development of the projected site will overload an existing downstream drainage facility, the Board may require the provision of water-retarding facilities or other improvements to alleviate said problem.*

The existing stormwater basin will provide sufficient controls to reduce the peak discharge rate of the subject lot and will not have an adverse impact on the Thatcher Brook as a result.

- e. *Development in specific areas of concern shall provide detailed information and address specific issues in relation to drainage:*

1. *Parcels situated within the federally designated flood hazard zone, as per Flood Hazard Boundary Map H01-18, dated May, 1984, as amended, shall comply with all applicable federal regulations relating thereto.*
2. *One-hundred-year flood elevation line shall be included where applicable.*
3. *No slope shall be created which results in a slope of more than two feet horizontal to one foot vertical unless proper retaining walls are proposed.*

The project is not located in any special flood hazard areas or 100-year floodplain. Slopes on site which are steeper than 2:1 shall receive rip rap stabilization or are proposed as retaining walls.

- f. *Drainage improvements shall be scheduled to be constructed as part of the first portion of any project where drainage improvements are proposed.*

This requirement is understood by the Applicant.

- g. *Special bonding of 1 1/2 times the anticipated cost of said improvements shall be incorporated by the developer to insure that improvements are placed and that they function as planned. No portion of this special bond may be released until the project, or that portion of the project for which the drainage improvement is proposed has been constructed, and until so released by the Planning Board, with the recommendation from the Director of Public Works and the City Engineer.*

The Applicant will coordinate with the City Planning and Code Enforcement Department accordingly.

2. Utilities

- a. *All utilities, including electric, gas, water/sewer, shall be shown on the plat, and separate detail sheets as needed.*

The existing nearby utilities and proposed utility services are shown on the project plans.

- b. *Accessways, storage, and parking areas shall be graded and improved with pavements, curbs, gutters, sidewalks, storm drainage facilities, outdoor lighting, etc.*

The proposed site will include bituminous pavement with slipform concrete curbing in the driveway, drive aisle, and parking areas. A fire lane located along the north side of the buildings will include reinforced turf material.

- c. *All accessways/drives and service ways shall be of sufficient width and configuration to accommodate the prospective traffic and to afford satisfactory access to police, firefighting and other such services.*

The proposed driveway and parking drive aisles are 24' wide. The northerly fire lane is 20' wide.

We have met with and reviewed the current plans with the Fire Department. The current plans reflect their comments and we have included a fire truck turning template with this application in Attachment I.

- d. *Any proposal within 200 feet of a public water or sewer line(s) must connect to system(s). Applicant must supply copies of letters from the environmental specialist of the City of Biddeford for sewer, and water company shall confirm details of connection and/or concerns.*

The proposed project will utilize the public water and sewer services which are located at the project frontage. Ability to Serve letters provided by the City Sewer department and the Maine Water Company are located in Attachment D

- e. *Whether or not a municipal water system is proposed, the following items must be specified in application narrative and on plat:*

1. *Rated normal capacity and gallons per minute at prime use time.*

The anticipated daily flows are estimated to be 11,040 gpd based on a design flow of 120 gpd for single units and 90 gpd per bedroom for multibedroom units assuming (36) 1-bedroom senior units and (20) 1-bedroom, (12) 2-bedroom and (8) 3-bedroom family units.

2. *Rated maximum capacity and gallons per minute at prime use time.*

The anticipated peak daily flow is estimated to be approximately three times the average daily flow.

3. *Residual pressure of proposed tap line.*

The residual pressure of the proposed tap line is expected to be approximately 60 psi per the Ability to Serve Letter provided by Maine Water Company in Attachment D.

- f. *Where nondomestic sanitary discharge (any discharge into the public sewer system containing other than normal household wastes) is anticipated, such effluent shall be identified and comply with any and all federal, state, and local laws, ordinances, rules, and regulations. Where any such laws, ordinances, rules and regulations may overlap or may be inconsistent, the more stringent shall apply.*

The proposed sanitary sewer flow are anticipated to be normal household wastes.

- g. *Where public sanitary service is available, or where developers must extend such service, applicants must apply for and receive a discharge permit from the City Council of the City of Biddeford prior to approval by the Planning Board.*

A letter confirming the wastewater treatment capacity was received on July 17th from the City of Biddeford Engineering Department. This is attached with the other Utility Correspondence in Attachment D.

- h. Where practicable, all electrical and telephone utilities shall be placed underground.*

All electrical and telephone/communications/fiber services will extend to the proposed buildings underground. These services are proposed to extend into the site within the northerly fire lane.

3. Parking

- a. A parking plan shall delineate the number of parking and delivery or loading spaces and the physical arrangement. Details of parking plan shall conform to the provisions of the off-street parking section of Article VI of this Zoning Ordinance.*

The proposed parking spaces are shown on the project plans and comply with the typical parking stall and ADA parking stall dimensions. The proposed contract zone requires a parking ratio of 0.67 spaces per unit, however we are currently providing 95 parking spaces (1.25:1 ratio). Additionally, an alternative striping plan is provided on the Site Plan which demonstrates a parking layout providing additional accessible parking spaces for 27 vehicles requiring accommodation. The total parking provided in the alternative parking scenario is 87 spaces. This is a requirement of the funding application for MaineHousing to demonstrate additional accessible units may be provided.

- b. No on-street parking, delivery or loading is permitted, except where specifically allowed by the Planning Board.*

No on-street parking is proposed as part of this project.

- c. Whenever a use existing on the effective date of these regulations is changed thereafter to a new use, parking facilities and access shall be provided as required herein for such new uses.*

The project will create new parking spaces applicable to the proposed residential uses.

- d. In the case of multifamily projects the number of required parking spaces should be increased 5% to allow for visitor parking.*

The project is providing 95 parking spaces which is greater than the minimum identified in the contract zone language. As such, the project will provide 5% visitor spaces.

- e. Parking lots shall be landscaped and/or screened to provide for a pleasing visual effect and blending in with the surrounding area.*

The majority of the parking spaces will be provided in the center of the site set back from Barra Road. Landscaping within parking islands and at the perimeter of the parking areas will provide screening for surrounding properties.

- f. Lots shall be illuminated for security purposes. The lighting shall be designed in such a way that off-site glare is minimized.*

A photometrics plan is provided in the plan set and lighting cut sheets are provided in Attachment J. This plan demonstrates the project's ability to minimize site glare and spillover onto adjacent properties by utilizing full cut-off, downcasting fixtures. These include wall-mounted around the buildings to cover entrances and the fire lane as well as pole-mounted lights within the driveway and parking areas.

- g. Adequate space shall be allowed for the accumulation of snow during the winter plowing months.*

Snow storage areas are shown on the Site Plan.

4. Structural Layout and Design

- a. Design of buildings.*

- 1. Buildings shall be designed to blend harmoniously with the surrounding structures in the neighborhood. New structures should be designed so as to complement the style of the abutting older structures. A photograph, architectural rendering or other representation of the proposed structure must accompany the application for site review.*

The proposed buildings have been designed to blend in with the surrounding neighborhood and offer aesthetically pleasing elements commonly found in New England architectural vernacular. Floorplans and elevations are provided in Attachment E.

- 2. In the I-3 Zone structures shall have a facade sheath in brick or other masonry finish. Other facade finishes may be used when it can be clearly shown to the board that such facing material will advance the City's intent to make the I-3 area a more attractive gateway to the City.*

The contract zone language allows the Applicant to utilize different siding materials and does not strictly require the use of a brick or other style masonry to be utilized on the building façade.

- b. Setbacks. Proposed structures shall be set back from roadways, in conformance with requirements for the particular zone; and shall be set in such a way as to blend in harmoniously with buildings on abutting properties, and to allow for adequate landscaping of the front yard.*

The contract zone language establishes a 30' front and 10' side/rear building setback which blends in harmoniously with the surrounding neighborhood. This allows for sufficient landscaping in the front yard and perimeter areas. These setbacks are shown on the project plans.

- c. Fire protection.*

- 1. All proposed structures and additions to existing buildings must be designed to meet existing fire protection standards.*

Both structures will be designed per the latest local and state fire protection requirements.

2. *Fire hydrants and fire escapes must be clearly presented on plats.*

The buildings are designed with multiple stair towers/egress points around the buildings to meet the applicable life safety requirements.

3. *Clear ways around buildings must be maintained to provide for 360° access to structures.*

Clear ways are provided around the building which have been reviewed by the Fire Department.

4. *Areas in front of structures must be kept clear of parking spaces to allow for emergency access.*

Sufficient clear space is provided in front of structures to provide emergency vehicle access.

5. *Buildings should be designed with internal sprinkler systems. This is particularly the case in terms of multifamily and industrial/warehousing structures, and structures that will be located in areas that are far or difficult to reach from fire stations.*

Both buildings will be constructed with sprinkler systems.

6. *In residential developments of 24 units or more, or buildings of 5,000 square feet or more, a central alarm system to the central fire station shall be installed, unless a negative recommendation, in writing, is received from the Fire Marshal.*

The Applicant will coordinate with the Fire Department to confirm the applicability of a central alarm system.

7. *In residential developments of 24 dwelling units or more, or office buildings with more than two separate establishments or places of business, a "knock box" shall be provided and indicated on plat. This box shall be in accordance with the specifications and standards as prescribed by the Fire Department of the City of Biddeford.*

The Applicant will coordinate with the Fire Department for the final location of a Knox Box for fire department access to the buildings as necessary.

8. *Whenever gas, either natural or propane or other type, is proposed to be used on-site, a separate external shutoff valve shall be provided for each building on the site. The valve location shall be indicated on the plat and approved in writing by the fire chief/fire marshal.*

The Site Plans identify a potential natural gas service alignment for each building, however, the service entry and shutoff valve location has not been finalized since an MEP designer has not been enlisted to complete the internal plumbing design. The final location of the service shut off valves will be coordinated with the Fire Department at the time of the Building Permit application.

d. *Landscaping.*

1. *All sites must be landscaped with vegetation that will act to:*

- (a) Reduce the impact of lighting, vehicular and structural, on abutting properties;*
- (b) Reduce the impact of proposed structures on the privacy of abutters;*
- (c) Make the site more attractive to the average viewer.*

The planting plan provides sufficient screening for the parking area and to abutting properties. Perimeter tree plantings will address the scale of the buildings and soften the view from the public way. The tree plantings along the road frontage will also continue the row of trees existing along the opposite side of Barra Road currently.

2. *Landscaping measures will be indicated on the plat by drawings and narrative note. The use of trees and shrubs for fencing and shading is strongly encouraged. Care must be taken to ensure that tree, etc., are placed in such a fashion that in time they will cause minimum impact on abutting properties and public roadways and travelways, particularly as they grow.*

The proposed detailed landscaping plan provided addresses placement of trees, perennials, shrubs and screen fencing to enhance the site while minimizing impacts to abutting properties, public roadways, and travelways. The design addresses the lifespan of the specified vegetation. Understory trees and canopy trees along with shrubs specified for parking improvements screening and travelways have been quantified on the plans. Perennials, wildflower beds and the interior courtyard areas will be finalized during the construction documentation phase.

3. *Whenever possible existing vegetation shall be preserved and incorporated into the landscaping scheme of the project.*

Much of the existing site sits as dry meadow, wetlands, and woody vegetation with perimeter trees along the lot boundaries. Along the southern edge the existing tree canopy will go mostly untouched providing a healthy existing tree canopy. The northern lot boundary will have a retaining wall and vine plantings- Efforts have been made to retain as much of the existing vegetation as possible behind the retaining wall but the removal of some mature pine trees and one cherry tree (8"+) along the proposed wall will be necessary. A vegetation management exhibit is provided in Attachment L.

4. *Each proposal will include a detailed landscaping plan. This plan will include the location, type and size of existing mature trees (those trees over eight inches in diameter).*

A thoughtful planting approach has been taken to offsetting visual impacts of the new structures. Canopy trees address the scale of the structure along Barra Road and wildflower seed mix has been specified to along the Barra Road frontage to naturalize the area creating an interesting/native planting palette for the site. The buildings fit well into the design trend of the neighborhood.

5. *Particular attention should be paid to offsetting the visual impact of new structures in areas where there may be a stark contrast with the existing design trend of the neighborhood.*

The buffer/screening areas including the front yard area and around the perimeter of the parking area have been planted to provide sufficient screening as requested. This is shown on the landscape plan provided in the project plans.

e. Service, storage and utility areas.

1. *All service, storage, and utility areas shall be designed to the side or rear yard of a proposed or existing building or structure, and such areas shall be appropriately screened/buffered by walls, fences, earth berms, or vegetation.*

The northerly fire lane will contain underground utilities, a private hydrant, and a padmount transformer. These utilities will be screened as much as possible while allowing sufficient access for servicing/use. Water and electrical meters as well as trash bins will be located interior to the building and not visible from the outside.

2. *Proposed utility elements shall be adequately screened; and, if producing sound, baffled upon Planning Board request.*

See response above.

3. *Trash receptacles, dumpsters, storage sheds, etc., shall be shown on plat.*

Trash bins are located internal to the building and, therefore, no exterior trash storage is provided.

f. Paving, parking, and storage areas.

1. *No paving, parking, or storage shall be permitted within the required setback of any side or rear property line;*

The contract zone language provides a 0' setback for paving/parking/fire lanes. This is necessary to provide sufficient parking and fire lane access while avoiding excessive impacts to natural site features such as the southerly wetlands. Currently, the southwest corner of the parking area is located 8.9' from the southerly property line which is adjacent an undeveloped property. All other parking is located 20' from any property line.

2. *No paving, parking, or storage (except for entrances/exits) shall be permitted within 25 feet of any front property line. These unpaved nonparking or nonstorage areas shall be maintained as landscaped areas or open spaces.*

The parking provided on site is located greater than 20' away from the front property line.

g. Handicapped accessibility.

1. *Pedestrian walkways, entrances and exits designed for use by the handicapped shall be provided as required by any and all federal, state, or local laws, ordinances, rules and regulations or as requested by the Planning Board.*

The project includes 4 accessible parking spaces for the senior building and 5 spaces for the family building. This is well above what would typically be required for minimum ADA parking space requirements and reflects the accessible apartment units the Applicant is pledging to construct as part of the MaineHousing (MSHA) Low Income Housing Tax Credit (LIHTC) program. To meet MSHA funding requirements, an additional 18 accessible spaces are demonstrated as a possible future parking scenario on the Site Plans should the Applicant seek to pledge additional accessible units within the buildings. Sufficient access is provided from the parking areas into the main entrance of the buildings along the designated ADA route.

2. *Handicapped parking spaces and accessways shall be indicated on plat whenever they are to be employed.*

The accessible parking spaces discussed above are shown on the project plans and Site/Subdivision Plan.

h. Loading facilities.

1. *Loading facilities for new structures shall be designed to the rear or side of any and all proposed or existing building or structure.*

Not applicable.

2. *Loading facilities shall be designed in accordance with the applicable federal, state, or local laws, ordinances, codes, rules and regulations and shall be off-street or accessible via a public street.*

Not applicable.

i. Parking, loading, and protective buffers.

1. *All parking, loading and protective buffers shall be situated on the same tract or parcel of land as the primary use building or structure.*

All parking, loading and buffers are located on the subject parcel as necessary.

2. *The maximum nonvegetated area of the land area being developed and reviewed shall be 75%.*

The proposed nonvegetated area is 56% of the total lot area.

3. *Any parking or paving, including all access ways, egress ways, entrances and exits on streets for both pedestrian and vehicular use, shall not cover or occupy more than 30% of the land*

area being developed and reviewed and shall be included with the maximum nonvegetated area.

The proposed parking/pavement area for the project total is 26% of the total lot area.

4. *In all applications, a minimum of 25% of the land area being developed and reviewed shall remain in its natural state or shall be maintained as appropriately landscaped area.*

The existing land area not to be disturbed is 32% of the total lot area.

5. *All buildings or structures shall be sited in conformance with established setbacks of the particular zone. No building or structure may be built within the required side yard setback. The Planning Board may require greater setbacks in areas such as turnpikes, water bodies, railroads, etc.*

The proposed buildings have been located on the property within the applicable setbacks established as part of the contract zone.

6. *All buffered or screened areas shall be densely planted with shrubs or trees which are respectively at least two or three feet high at the time of planting and are of a type which may be expected to form a year-round dense screen of at least five feet high within three years, provided that such screening shall not obstruct the view of oncoming traffic when entering or exiting the site. An additional cash bond to cover the cost of replacement of these plantings may be required. The term of the bond shall be equal to three years from the time of planting. At the end of the three years any unused portion of this security will be returned to the applicant along with accrued interest.*

The buffer/screening areas including the front yard area and around the perimeter of the parking area have been planted to provide sufficient screening as requested. This is shown on the landscape plan provided in the project plans.

j. Open space.

1. *In new residential developments: Open space shall be provided in the ratio of 1,000 square feet for each dwelling unit. This open space shall be identified as either a "green space" or as "recreational space."*

The contract zone language identifies an open space ratio of 250SF per unit. Based on the density afforded, 76 units would typically require 76,000SF of open space area which is not feasible on this site while also balancing the required driveway, parking, and emergency access. We note that green space will be provided on site for residents of both buildings around the site including an active porch area which will appeal to residents of all ages. Additionally, the Eastern Trail is located a short distance away on Barra Road.

2. *Whenever practicable, open space in a residential development shall include a mixture of active and passive recreational opportunities to benefit the various residents of the project. Such opportunities would include, but are not limited to, ball and other playing fields, tennis*

courts, etc.

The current plans include exterior recreational opportunities including front porches and a natural play/garden area in between the two buildings. These spaces will include chairs, benches, and bike racks.

3. *In large-scale projects hiking trails or nature paths are encouraged.*

The project is located a short distance away from the Eastern Trail which connects to Barra Road.

4. *In projects that abut rivers or streams a public easement is encouraged, to provide access to a limited natural resource.*

Not applicable.

5. *The plan shall reflect the natural capabilities of the site to support development. Buildings, lots, and support facilities will be clustered in those portions of the site that have the most suitable conditions for development. Environmentally sensitive areas, including but not limited to wetlands, steep slopes, floodplains, significant wildlife habitats, fisheries, scenic areas, habitat for rare and endangered plants and animals, unique natural communities and natural areas, and sand and gravel aquifers will be maintained and preserved to the maximum extent. The development shall include appropriate measures for protecting these resources, including but not limited to modification of the proposed design of the site, timing of construction, and limiting the extent of excavation.*

The site layout and grading for the development leverages the existing topography and southerly exposure of the lot. Buildings are situated along the northerly property boundary on higher elevations than parking areas. Southerly on the lot there are mapped wetland areas which the site layout is careful to avoid and maintain vegetated buffers. There are no other sensitive natural resources which would require further avoidance.

k. *External lighting.*

1. *All existing/proposed external lighting must be included on plat. Lighting will be described as needed.*

Existing and proposed lighting locations are provided in the project plans.

2. *Lighting shall be designed to provide adequate illumination on-site, especially in parking areas, walkways and structural entrances, and site entrance from roadways. At the same time all illumination will be designed to mitigate adverse impact on abutting properties and structures, and traffic.*

A photometrics plan is provided in the project plans. Lighting fixture cuts sheets are provided in Attachment J which provides sufficient lighting for the parking areas and building entrances.

l. Signs.

1. *All proposed signs shall meet standards provided in Article VI of the Zoning Ordinance of the City of Biddeford.*

The buildings may include address numbers on each building, facing Barra Road. Currently, no other signs are proposed for the buildings. These addresses would be placed on the building in accordance with the applicable City Code.

2. *Signs shall be indicated on plat.*

No freestanding signs are proposed on the project site. It is anticipated that building mounted lettering/signage will be utilized to display the project addresses which will be coordinated with the Planning Department and/or Code Enforcement.

3. *A detail of sign design shall be submitted as part of the application for site review.*

We would request that the final signage be provided as a condition of approval prior to issuance of a building permit for each building to allow sufficient design for these final details.

- m. Historic and archaeological resources. If any portion of the site has been identified as containing historic or archaeological resources, the development shall include appropriate measures for protecting these resources, including but not limited to modification of the proposed design of the site, timing of construction, and limiting the extent of construction.*

As part of the original SLDA permit process for the business park, historical and archeological review was undertaken for the entire subdivision and, ultimately, no significant resources were identified within the subject lot and/or the subdivision.

Subdivision Review Requirements

In accordance with § 66-39 *Board action on approval of preliminary plan* of the City of Biddeford's Code of Ordinances, the following information is provided.

Required Information § 66-35(d)

(d) In addition to the above plat information, the subdivider shall provide the following documents;

- (1) Valid deed or option indicating an interest held by the subdivider in the parcel of land (this shall be kept current during the review process).*

A copy of the deed for the subject parcel is provided in Attachment B.

- (2) Completed application form.*

The completed application form is provided in Attachment A.

- (3) *Narrative of the proposed project briefly describing the general nature of the project, i.e., type of project; residential or commercial; number of lots intended to create.*

A narrative describing the project is provided at the beginning of this application letter.

- (4) *Draft covenants and deeds for each lot proposed.*

The subdivision review requirements are applicable to the multifamily aspect of the development and are not a part of a multi-lot split. However, it is anticipated that the Applicant will declare a land condominium comprised of two units - one condominium unit for each building. The purpose of the condominium is to allow for separate financing of each building – one by each applicant entity. However, control of the development will remain Westbrook Development Corporation which serves as the sole member of the Applicant's general partner entity, WDC GP, LLC. Final condominium documentation will be provided, if required by the Planning Board.

- (5) *Easement documents for proposed rights-of-way for utilities, drainageways, roadways and other travelways or public amenities.*

In the event condominium ownership structure is utilized, cross easements and common elements will be established for driveway access, utilities, drainage and parking, between the two buildings will be described in the condominium documentation.

- (6) *Statement of financial capability of subdivider to undertake the proposed project.*

A financial capacity letter is provided in Attachment C of this application.

- (7) *Statement identifying principals involved in the project.*

A company profile and personnel profiles are provided as Technical Capacity evidence in Attachment C for the Westbrook Development Team. Additionally, the design team currently includes:

- Project Architect – Kaplan Thompson Architects
 - Jesse Thompson, FAIA, LEED AP, CPHC
 - Selomi Nganga
- Project Engineer – Gorrill Palmer
 - Kaleb Bourassa, PE
- Project Landscape Architect – DRY Landscape Architecture
 - Braden Drypolcher, RLA

- (8) *Statement demonstrating that the subdividers have the technical capability to complete the proposed project as presented.*

Evidence of Technical Capacity is provided in Attachment C.

(9) Copies of such covenants or deed restrictions as are intended to all or part of the tract.

The property is the subject of a MaineDEP SLDA/NRPA permit under Permit Order #L-19832-AN-BN which was approved in April 1999 for the Thatcher Brook Business Park. That permit approval required deed restrictions be conveyed to buyers/lessees of individual lots restricting the conveyance subject to the terms and conditions of the permit. Additionally, a signed and dated statement from the subject lot buyer should be kept on file by the City acknowledging the terms and conditions of the Permit. The City of Biddeford created a Declaration of Covenants, Conditions, and Restrictions for Exit 4 Business Park (now Thatcher Brook Business Park) which includes the same deed restrictions and business park standards to comply with the Original Permit. The Applicant is coordinating with the City Council and Staff to release the deed restrictions/covenants regarding residential use and project design on the property.

(10) Review by water company, power company and City Engineering, police, and fire department.

We have reached out to the Maine Water Company, City Engineering, and police and fire departments for review. Confirmation of capacity to serve has been received from Maine Water and City Engineering for water usage and wastewater capacity, respectively. We understand the Fire Department is satisfied with the site planning for emergency access and no further comments are anticipated. We await final approval from the police department.

Conditions and Requirements § 66-39(b)

(b) The Board shall base its decision on the plans meeting the conditions and requirements outlined in this chapter; and that the plan meets in a positive fashion, the following:

- (1) The project will not result in undue water or air pollution. In making this determination the Board shall consider:*
 - a. The elevation land, and its relation to the floodplains;*
 - b. The nature of the soils and the subsoils;*
 - c. The ability to adequately support waste disposal;*
 - d. The slope of the land and its affects on effluents;*
 - e. The availability of streams for the disposal of effluents; and*
 - f. The applicable state and local health and water resources regulations.*

The project is a residential development and will not cause undue air or water pollution.

(2) The project has sufficient water available for the reasonably foreseeable needs of the subdivision;

The project will be served by public water emanating from Barra Road. Domestic and fire services will extend into both buildings.

(3) The project will not cause an unreasonable burden on an existing water supply, if one is utilized;

The Maine Water Company has confirmed sufficient capacity to serve the proposed 76-unit residential development. The Ability to Serve letter is provided in Attachment D.

- (4) The project will not cause unreasonable soil erosion or reduction in the capacity of the land to hold water so that a dangerous or unhealthy, condition may result;*

The proposed site improvements will include buildings, pavement, reinforced turf, and landscaped area, among other surfaces, which will remain stabilized post-construction. No unreasonable soil erosion or dangerous conditions will be created as a result of this project.

- (5) The project will not cause unreasonable highway or public road congestion or unsafe conditions with respect to use of the highways or public roads existing or proposed;*

The project is proposed to create 39 peak hour trip ends which is not anticipated to cause unsafe traffic conditions on Barra Road and the adjacent street systems. A traffic memo is provided in Attachment H which demonstrates the trip generation and driveway safety review.

- (6) The project will provide for adequate sewage waste disposal.*

The project will utilize the public sewer system which flows cross-country through the subject parcel.

- (7) The project will not cause unreasonable burden on the ability of the municipality to disposal of solid waste and sewage if municipal services are to be utilized;*

The development will utilize a private trash collection vendor to handle solid waste generated. The development will not cause an unreasonable burden on the municipality to provide sewage treatment.

- (8) The project will not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites, or rare and irreplaceable natural areas or public rights for physical or visual access to the shoreline. Further, the plan shall reflect the natural capabilities of the site to support development. Buildings, lots, and support facilities will be clustered in those portions of the site that have the most suitable conditions for development. Environmentally sensitive areas, including but not limited to wetlands, steep slopes, floodplains, significant wildlife habitats, fisheries, scenic areas, habitat for rare and endangered plants and animals, unique natural communities and natural areas, and sand and gravel aquifers will be maintained and preserved to the maximum extent. The development shall include appropriate measures for protecting these resources, including but not limited to modification of the proposed design of the site, timing of construction, and limiting the extent of excavation;*

The project will not have an undue effect on the scenic character of the area. The project will utilize a natural color pallet and locate buildings set back from the Barra Road sufficient to provide buffering in the front yard area and around the perimeter of the development.

- (9) The project is in conformance with a duly adopted subdivision regulation or ordinance, Comprehensive Plan, development plan, or land use plan, if any. In making this determination*

the Board is authorized to interpret these ordinances and plans;

The project is in line with the recent Comprehensive Plan which was completed in 2023. That plan outlined the rising cost for housing and the need for additional housing within the community.

(10)The subdivider has adequate financial and technical capacity to meet the above stated standards;

Evidence of financial and technical capacity has been provided in Attachment C. The financial capacity letter is from Gorham Savings Bank.

(11)Whenever situated, in whole or in part, within 250 feet of any lake, pond, river or tidal waters, the project will not adversely affect the quality of that body of water, or unreasonably affect the shoreline of that body of water, as indicated on the City of Biddeford, Official Zoning Map and referenced in the City's Comprehensive Plan;

The project is not located within 250' of any lake, pond, river or tidal waters.

(12) The project will not, alone or in conjunction with existing activities, adversely affect the quality or quantity of ground water.

The project has been designed and will continue to operate as originally intended in the stormwater management plan which was approved for the Thatcher Brook Business Park as approved by the MeDEP and City of Biddeford.

(13)The subdivider will provide information, based on FEMA flood boundary, floodway, and flood insurance maps, whether or not the project is in a flood prone area;

The project is not located within the FEMA flood boundary, floodway, or flood insurance maps.

(14)The project will not unreasonably obstruct abutting properties or structures access to direct sunlight;

The project will not obstruct abutting properties access to sunlight as it is lower in elevation and separated a sufficient distance from the nearest structure.

(15)If any portion of the site has been identified as containing historic or archaeological resources, the development shall include appropriate measures for protecting these resources, including but not limited to modification of the proposed design of the site, timing of construction, and limiting the extent of construction.

No portion of the site has been identified as containing historic or archeological resources as concluded in previous local and state review efforts for the business park.

Closure

The Project Team looks forward to the Department's review of application. If you have any questions with regards to the submission material or need additional copies, please contact our office.

Sincerely,



Kaleb Bourassa, PE

Project Manager

Phone 207-772-2515 x297

KBourassa@GorrillPalmer.com

Attachments:

- A – Planning Board Application, Agent Authorization
- B – Title, Right & Interest
- C – Financial and Technical Capacity
- D – Utility Correspondence
- E – Architectural Renderings/Drawings of Proposed Buildings
- F – Site Photos
- G – Stormwater Management Memo
- H – Traffic Report
- I – Fire Truck Turning Movements
- J – Lighting Fixture Cut Sheets
- K – Engineer's Opinion of Cost
- L – Vegetation Management Exhibit
- Site Plans

c: Tyler Norod, Westbrook Development Corporation (WDC)
Maggie Stanley, WDC
Jesse Thompson, Kaplan Thompson Architects

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PROJECT PARCEL SITE CITY OF BIDDEFORD TAX ASSESSOR'S MAP AND LOT NUMBERS		
MAP	LOT	CCRD
2	42	B 3051 / P 245

PROJECT APPLICANT:
WESTBROOK DEVELOPMENT CORPORATION
THATCHER BROOK APARTMENTS I, LP
THATCHER BROOK APARTMENTS II, LP
30 LIZA HARMON DRIVE
WESTBROOK, ME 04092
ATTN: TYLER NOROD

CURRENT PROPERTY OWNER OF RECORD:
CITY OF BIDDEFORD
C.C.R.D. BOOK 3051, PAGE 245

ZONE: I3 - INDUSTRIAL COMMERCIAL ZONE
CONTRACT ZONE
USE: RESIDENTIAL
WATERSHED: THATCHER BROOK

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L1

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L2

LANDSCAPE DETAILS (BY DRY LANDSCAPE ARCHITECTURE)

*NOT INCLUDED IN THIS SUBMISSION

CITY OF BIDDEFORD PLANNING BOARD SITE PLAN APPROVAL	
CHAIRMAN _____	

DATE _____	

SITE IMPROVEMENT PLANS

FOR

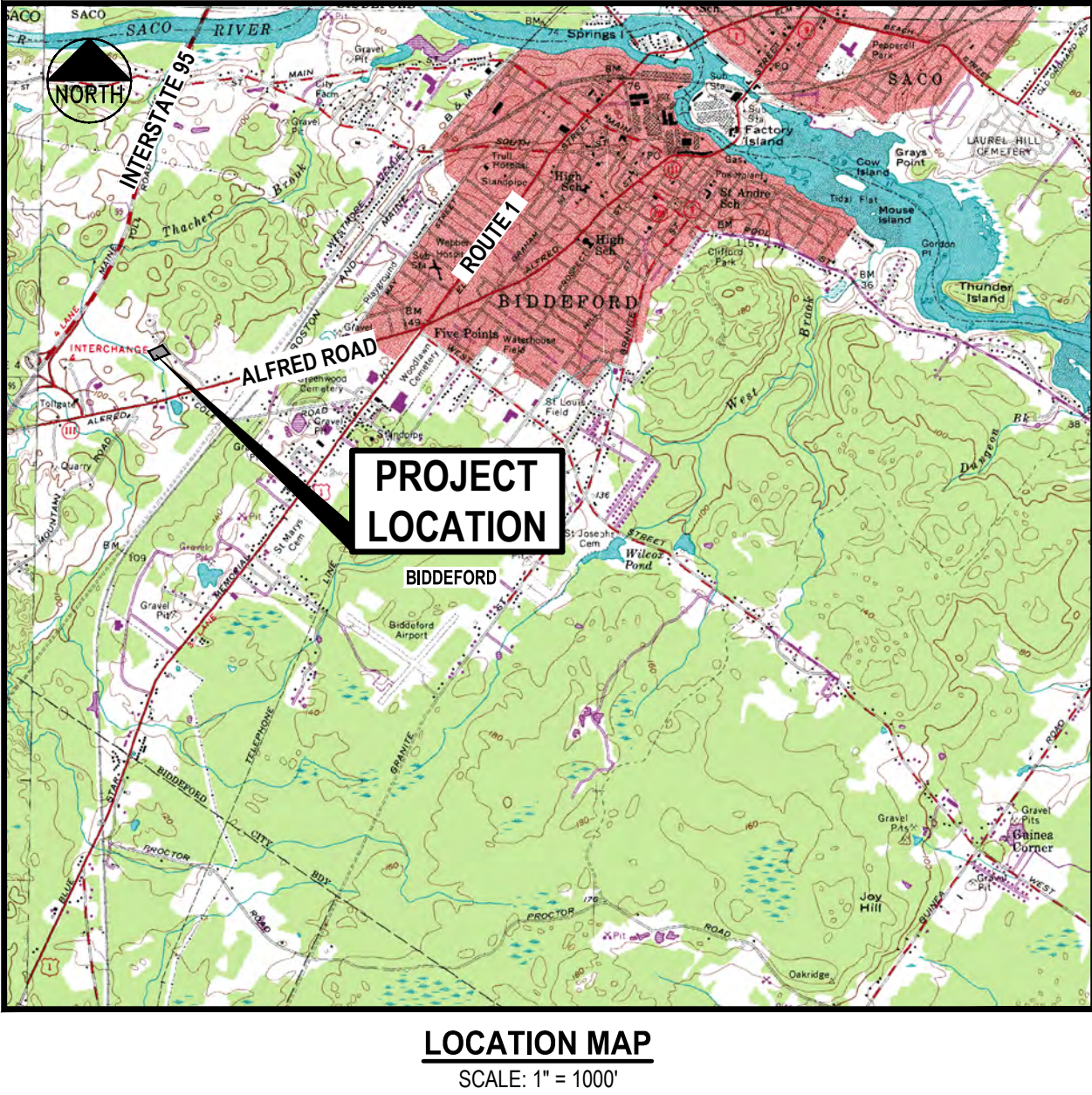
WESTBROOK DEVELOPMENT CORPORATION

76 - UNIT RESIDENTIAL DEVELOPMENT

37 BARRA ROAD, BIDDEFORD, MAINE

JULY 2024

PERMIT PLANS



UTILITIES

WATER
ATTN: MARCUS KNIPP
MAINE WATER COMPANY
466 SOUTH STREET
BIDDEFORD, MAINE 04005

ELECTRIC
ATTN: JAY AGRESTE
CENTRAL MAINE POWER COMPANY
162 CANCO ROAD
P.O. BOX 1801
PORTLAND, MAINE 04104
207.242.4092 (OFFICE)
jay.agreste@cmpco.com

TELEPHONE
ATTN: PATRICK MORRISON
CONSOLIDATED COMMUNICATIONS
5 DAVIS FARM ROAD
PORTLAND, MAINE 04103
207.797.1866

CABLE
ATTN: MARK PELLETIER
CHARTER COMMUNICATIONS
118 JOHNSON ROAD
PORTLAND, MAINE 04102
207.253.2291
mark.pelletier@charter.com

SEWER & STORM DRAIN
ATTN: TOM MULLIGAN
CITY OF BIDDEFORD
205 MAIN STREET
BIDDEFORD, MAINE 04005
207.284.9118

DIG SAFE
1.800.225.4977

PERMITS / APPROVALS

LOCAL
SITE PLAN PERMIT

CITY OF BIDDEFORD
205 MAIN STREET
BIDDEFORD, MAINE 04005
207.571.0700

BUILDING PERMIT

CITY OF BIDDEFORD
205 MAIN STREET
BIDDEFORD, MAINE 04005
207.571.0700

DRIVEWAY/ENTRANCE PERMIT

CITY OF BIDDEFORD
205 MAIN STREET
BIDDEFORD, MAINE 04005
207.571.0700

STATE
SITE LOCATION OF DEVELOPMENT ACT PERMIT

MAINE DEP
312 CANCO ROAD
PORTLAND, MAINE 04103
207.822.6300

STATUS
SKETCH PLAN SUBMITTED 05.29.2024
PRELIMINARY SITE/SUBDIVISION PLAN SUBMITTED 06.26.2024
FINAL SITE/SUBDIVISION PLAN SUBMITTED 07.17.2024

TO BE SUBMITTED BY CONTRACTOR

PERMIT ORDER #L-19832-39-A-N
APPROVED: APRIL, 1999

CONSULTANT LIST

CIVIL ENGINEER:
Gorrill Palmer Consulting Engineers, Inc.
300 SOUTHBOROUGH DRIVE, SUITE 200
SOUTH PORTLAND, MAINE 04106
207.772.2515
CONTACT: KALEB BOURASSA, P.E.
kbourassa@gorrillpalmer.com

SURVEYOR (TOPOGRAPHY AND BOUNDARY):
Owen Haskell, INC.
390 US ROUTE 1, UNIT 10
FALMOUTH, ME 04105
207.774.0424
CONTACT: RANDY LOUBIER, PLS

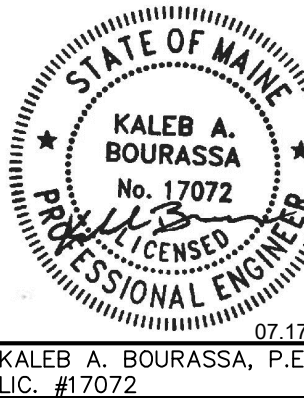
ARCHITECT:
Kaplan Thompson Architects
102 EXCHANGE STREET
PORTLAND, ME 04101
207.842.2888
CONTACT: JESSE THOMPSON, FAIA, LEED AP, CPHC

LANDSCAPE ARCHITECT:
DRY Landscape Architecture
31 MILLER AVENUE
BIDDEFORD, ME 04005
CONTACT: BRADEN DRYPOLCHER, RLA

WETLANDS:
Flycatcher, LLC
106 LAFAYETTE STREET, SUITE 2A
YARMOUTH, ME 04096
CONTACT: ROD KELSHAW
rod@flycatcherllc.com

ALL PERMITS ARE ANTICIPATED TO HAVE CONDITIONS ATTENDANT WITH THEIR APPROVAL. THE CONTRACTOR SHALL REVIEW ALL PERMITS AND THE CONDITIONS ATTENDANT WITH APPROVALS PRIOR TO THE START OF THE WORK. UNLESS OTHERWISE STIPULATED BY THE CONTRACT DOCUMENTS, THE CONTRACTOR IS REQUIRED TO COMPLY AND FULFILL ALL CONDITIONS OF APPROVAL.

NOTE: THIS PLAN SET IS ISSUED FOR PERMITTING PURPOSES & SHALL NOT BE USED FOR CONSTRUCTION.



Kaleb Bourassa

I HEREBY ACKNOWLEDGE THAT THESE PLANS AND SPECIFICATIONS WERE PREPARED UNDER MY DIRECT SUPERVISION, AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MAINE AND THAT I AM COMPETENT TO PREPARE THIS DOCUMENT.

Design: KAB	Draft: CDD	Date: JUNE 2024
Checked: SRB	Scale: AS NOTED	Job No.: 4303
File Name: 4303-COVER.dwg		

This plan shall not be modified without written permission from Gorrill Palmer. Any alterations, authorized or otherwise, shall be at the user's sole risk and without liability to Gorrill Palmer.



Gorrill Palmer, an LJB Engineering Company
GorrillPalmer.com
(207) 772-2515
300 Southborough Drive - Suite 200
South Portland, ME 04106

Drawing Name:	COVER SHEET
Project:	PROPOSED RESIDENTIAL DEVELOPMENT 37 BARRA ROAD, BIDDEFORD, MAINE
Client:	WESTBROOK DEVELOPMENT CORPORATION 30 LIZA HARMON DRIVE, WESTBROOK, ME 04092

Drawing No.

C-1.0

GENERAL NOTES

1. IN ADDITION TO THESE PLANS AND NOTES, THE CONTRACTOR SHALL REFER TO PROJECT DOCUMENTS PREPARED BY KAPLAN THOMPSON ASSOCIATES FOR CONSTRUCTION SPECIFICATIONS AND BIDDING PROCEDURES.
2. THIS PROJECT WILL BE SUBJECT TO THE TERMS AND CONDITIONS OF ALL PERMITS ISSUED BY THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, MAINE DEPARTMENT OF TRANSPORTATION, LOCAL UTILITY COMPANIES AND THE CITY OF BIDDEFORD.
3. THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF THE ENTRANCE, PAVING, PRECISE BUILDING DIMENSIONS, AND EXACT BUILDING UTILITY ENTRANCE POINTS. ENTRANCES IN MOST LOCATIONS REQUIRE STRUCTURAL SLABS. REFER TO THE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR INFORMATION ON THE STRUCTURAL SLAB ENTRANCES.
4. ALL REQUIRED AND NECESSARY INSPECTIONS AND OR CERTIFICATIONS REQUIRED BY CODES AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO ANNOUNCED BUILDING POSSESSIONS AND THE FINAL SERVICE CONNECTIONS.
5. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR THE ELEVATION OF THE EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AND DIG SAFE AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS, AT ITS SOLE COST.
6. MAINTENANCE OF EROSION CONTROL MEASURES IS OF PARAMOUNT IMPORTANCE TO THE APPLICANT AND THE CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL EROSION CONTROL MEASURES SHOWN ON THE PLANS. ADDITIONAL EROSION CONTROL MEASURES SHALL BE INSTALLED IF DEEMED NECESSARY BY ONSITE INSPECTIONS OF THE OWNER, THEIR REPRESENTATIVES, OR THE CITY, AT NO ADDITIONAL COST TO THE OWNER.
7. ALL MATERIAL SCHEDULES SHOWN ON THE PLANS ARE FOR GENERAL INFORMATION ONLY. THE CONTRACTOR SHALL PREPARE HIS OWN MATERIAL SCHEDULES BASED UPON HIS PLAN REVIEW. ALL SCHEDULES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ORDERING MATERIALS OR PERFORMING WORK.
8. ALL MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO THE PROJECT SPECIFICATIONS, THE CITY OF BIDDEFORD AND SERVICING UTILITY REQUIREMENTS, IN CASES WHERE THESE CONFLICT THE MOST STRINGENT SHALL APPLY AT NO EXTRA COST TO THE OWNER.
9. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RECORD DRAWINGS THROUGHOUT THE PROJECT AND PROVIDING THE OWNER WITH A SET OF ELECTRONIC FINAL RECORD DRAWINGS WHEN THE PROJECT IS COMPLETE.
10. THE CONTRACTOR WILL BE RESPONSIBLE FOR CREATING AND ADMINSTRATING A POLLUTION PREVENTION PLAN FOR THE PROJECT TO PREVENT CONTAMINATION OF ALL AUTHORIZED AND UNAUTHORIZED NON-STORMWATER DISCHARGES INTO THE STORMWATER SYSTEM. SEE BELOW FOR A LIST OF NON-STORMWATER DISCHARGES:

AUTHORIZED NON-STORMWATER DISCHARGES:

(a) DISCHARGES FROM FIREFIGHTING ACTIVITY;

(b) FIRE HYDRANT FLUSHINGS;

(c) VEHICLE WASHWATER IF DETERGENTS ARE NOT USED AND WASHING IS LIMITED TO THE EXTERIOR OF VEHICLES (ENGINE, UNDERCARRIAGE AND TRANSMISSION WASHING IS PROHIBITED);

(d) DUST CONTROL RUNOFF IN ACCORDANCE WITH PERMIT CONDITIONS AND APPENDIX (C)(3);

(e) ROUTINE EXTERNAL BUILDING WASHDOWN, NOT INCLUDING SURFACE PAINT REMOVAL, THAT DOES NOT INVOLVE DETERGENTS;

(f) PAVEMENT WASHWATER (WHERE SPILLS/LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAVE NOT OCCURRED, UNLESS ALL SPILLED MATERIAL HAD BEEN REMOVED) IF DETERGENTS ARE NOT USED;

(g) UNCONTAMINATED AIR CONDITIONING OR COMPRESSOR CONDENSATE;

(h) UNCONTAMINATED GROUNDWATER OR SPRING WATER;

(i) FOUNDATION OR FOOTER DRAIN-WATER WHERE FLOWS ARE NOT CONTAMINATED;

(j) UNCONTAMINATED EXCAVATION DEWATERING (SEE REQUIREMENTS IN APPENDIX C(5));

(k) POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHINGS; AND

(l) LANDSCAPE IRRIGATION.

UNAUTHORIZED NON-STORMWATER DISCHARGES:

(a) WASTEWATER FROM THE WASHOUT OR CLEANOUT OF CONCRETE, STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS OR OTHER CONSTRUCTION MATERIALS;

(b) FUELS, OILS OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE;

(c) SOAPS, SOLVENTS, OR DETERGENTS USED IN VEHICLE AND EQUIPMENT WASHING; AND

(d) TOXIC OR HAZARDOUS SUBSTANCES FROM A SPILL OR OTHER RELEASE.

SITE LAYOUT NOTES

1. ALL HANDICAP PARKING SPACES ARE TO RECEIVE HANDICAP SIGNS AND PAVEMENT MARKINGS AS ILLUSTRATED ON THE DETAIL SHEETS.
2. BITUMINOUS CONCRETE CURB, SLIPFORM CONCRETE CURB AND GRANITE CURB SHALL MEET THE REQUIREMENTS OF MDOT 702.001, 703.07 AND 609.04.
3. ALL DIMENSIONING, UNLESS NOTED OTHERWISE, IS TO THE FACE OF CURB OR THE FACE OF THE BUILDING.
4. EXCEPT WHERE INDICATED OTHERWISE, THE PAVEMENT IS TO BE STANDARD DUTY PAVEMENT.
5. ALL TRAFFIC CONTROL SIGNS INDICATED ON THE SITE LAYOUT PLAN ARE TO MEET ALL REQUIREMENTS & STANDARDS OF THE MAINE DEPARTMENT OF TRANSPORTATION, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITIONS AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS.
6. STRIPE PARKING AREAS, DRIVES AND ROADWAY AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, CROSSWALKS, HANDICAP SYMBOLS, PAINTED ISLANDS AND FIRE LANES. (ALL MARKINGS EXCEPT MEDIAN ISLANDS AND CENTERLINES TO BE CONSTRUCTED USING WHITE TRAFFIC PAINT). ALL TRAFFIC PAINT SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F". MEDIAN ISLANDS AND CENTERLINES TO BE CONSTRUCTED USING YELLOW TRAFFIC PAINT.
7. SEE DETAILS FOR PARKING STALL DIMENSIONS, HANDICAP SYMBOLS, SIGNS AND SIGN POSTS.
8. STOP BARS SHALL BE 12" WIDE.
9. PAINTED ISLANDS SHALL BE 4' WIDE DIAGONAL LINES @ 3'-0" O.C. BORDERED BY 4" WIDE LINES.

GRADING & DRAINAGE NOTES:

1. ALL STORM DRAIN PIPE SHALL BE SMOOTH BORE INTERIOR PROVIDING A MANNINGS ROUGHNESS COEFFICIENT OF N = 0.012 OR LESS.
2. PROVIDE TURF REINFORCEMENT IN AREAS INDICATED ON THE PLANS.

3. AN "AS-BUILT" CERTIFICATION AND PLANS OF THE STORMWATER DRAINAGE SYSTEM IS REQUIRED PRIOR TO THE OWNER ACCEPTING ANY BUILDINGS AND PROPERTY. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT ANY DEVIATION FROM THE PLANS MAY DELAY THE ACCEPTANCE OF THE PROJECT, WITH CONTRACTOR RESPONSIBLE FOR ANY ASSOCIATED COSTS.
4. SEE EXISTING CONDITIONS FOR BENCHMARK INFORMATION.
5. SEE GRADING, DRAINAGE AND EROSION/SEDIMENT CONTROL FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
6. ALL DISTURBED AREAS NOT TO BE PAVED, SODDED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED, FERTILIZER AND MULCH.
7. COMPACTION REQUIREMENTS:

LOCATION	MINIMUM COMPACTION*
SUBBASE AND BASE GRAVEL BELOW PAVED OR CONCRETE AREAS	95%
SUBGRADE FILL BELOW PAVED AREAS	90%
TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL	95%
BELOW LOAM AND SEED AREAS	90%
STRUCTURAL FILL WITHIN PROPOSED BUILDING AREA	95%
SELECT FILL ADJACENT BUILDING FOUNDATIONS, EXTERIOR FOUNDATIONS	95%
AND WITHIN 8 INCHES OF THE SLAB-ON-GRADE	
*ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM-D-1557.	

8. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
9. CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCE AND EXIT RAMPS ADJACENT TO THE BUILDING AND ALONG NEW CURBED AREAS.
10. PROVIDE STABILIZATION OR SEPARATION GEOTEXTILE FABRIC OVER UNSTABLE SOILS AS DIRECTED BY THE OWNER'S REPRESENTATIVE AND IN ACCORDANCE WITH THE FINAL GEOTECHNICAL RECOMMENDATIONS.

LOCAL APPROVALS, WAIVERS AND VARIANCES

THE CONSTRUCTION PLANS ARE TO BE SUBMITTED TO THE CITY OF BIDDEFORD FOR THEIR REVIEW, APPROVAL AND RECORDS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

UTILITY NOTES

1. ALL REQUIRED UTILITIES SERVING THE PROJECT SHALL BE COORDINATED AND CONSTRUCTED BY THE DIVISION SITE CONTRACTOR TO WITHIN 5 FEET OF THE BUILDINGS, AT A LOCATION COORDINATED WITH THE MEP CONTRACTOR(S) AND THE BUILDING PLANS. SITE WORK WITHIN 5 FEET OF UNDERSLAB UTILITIES SHALL CONSIST OF TRENCHING AND BACKFILLING. ACTUAL UTILITY INSTALLATION SHALL BE BY THE MEP CONTRACTOR. ALL REQUIRED CONNECTION FEES SHALL BE PAID BY THE GENERAL CONTRACTOR.
2. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF AND/OR RELOCATION OF OVERHEAD AND UNDERGROUND TELEPHONE WITH CONSOLIDATED COMMUNICATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR CONDUITS, PULL WIRES, TRENCHING AND BACKFILLING NECESSARY TO COMPLETE THE WORK.
3. ALL SANITARY SEWER WORK SHALL MEET THE STANDARDS OF THE MAINE STATE PLUMBING CODE, CITY OF BIDDEFORD STANDARDS AND THE SUBSURFACE WASTEWATER DISPOSAL RULES.
4. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ELECTRIC SERVICE WITH CENTRAL MAINE POWER.
5. COORDINATE ALL UTILITY WORK WITH THE APPROPRIATE UTILITY COMPANY. ALL UTILITY WORK SHALL CONFORM TO THE STANDARDS OF THE UTILITY COMPANY AND PROJECT SPECIFICATIONS, WHICHEVER IS MORE STRINGENT.
6. THE LOCATIONS OF THE NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE SERVING UTILITY COMPANY, CONTRACTOR AND MEP DESIGNERS.
7. UNDERGROUND ELECTRICAL, CONDUIT MATERIAL AND INSTALLATION SHALL CONFORM TO UTILITY COMPANY STANDARDS AND PROJECT SPECIFICATIONS, WHICH EVER IS MORE STRINGENT.
8. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OR WORK TO FINISH GRADE.
9. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
10. THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATES TO THE OWNER PRIOR TO COMPLETION OF THE PROJECT.
11. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL BOXES, FITTINGS, CONNECTORS, COVER PLATES AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL, AT NO EXTRA EXPENSE TO THE OWNER.
12. A 5 FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18 INCH OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER AND SANITARY SEWER CROSSINGS.
13. THE CONTRACTOR SHALL PHASE UTILITY CONSTRUCTION AND PROVIDE TEMPORARY SERVICES AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO THE JOB SITE. TEMPORARY SERVICES SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. COORDINATE ALL TEMPORARY SERVICES WITH UTILITY COMPANY, OWNER AND AFFECTED BUSINESSES.

LANDSCAPE NOTES

(SUBJECT TO COORDINATION WITH LANDSCAPE DRAWINGS. IN CASE OF CONFLICT BETWEEN THIS SECTION AND THE LANDSCAPE DRAWINGS, THE LANDSCAPING DRAWINGS SHALL GOVERN)

1. ALL PLANTS SHALL BE NURSERY GROWN AND WORKMANSHIP SHALL CONFORM TO THE AMERICAN ASSOCIATION OF NURSERYMEN, STANDARDS AND SHALL BE SUBJECT TO THE APPROVAL OF THE OWNERS REPRESENTATIVE BEFORE AND AFTER PLANTING.
2. PLANTS SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER INSPECTION AND ACCEPTANCE, AND SHALL HAVE AT LEAST 80% HEALTHY GROWTH AT THE END OF THE GUARANTEED PERIOD.
3. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM AND SEED.
4. THREE (3) INCH BARK MULCH IS TO BE USED AROUND THE TREE AND SHRUB PLANTING AS SPECIFIED IN THE DETAILS. WHERE BARK MULCH IS USED IN A CURBED ISLAND, THE BARK SHALL MEET THE TOP INSIDE EDGE OF THE CURB. ALL OTHER AREAS SHALL RECEIVE 6" LOAM AND SEED.
5. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTING AS SHOWN.
6. PARKING AREA PLANTED ISLANDS TO HAVE A MINIMUM OF 6" TOPSOIL. REMOVE ALL CONSTRUCTION DEBRIS BEFORE TOPSOILING. TOPSOIL SHALL BE PLACED TO TOP OF CURB.

7. ALL PLANT MATERIAL SHALL BE APPROVED BY THE OWNER OR THE OWNERS REPRESENTATIVE PRIOR TO ARRIVAL ON THE SITE.
8. PLANT MATERIAL SHALL BEAR THE SAME RELATIONSHIP TO FINISHED GRADE AS TO THE ORIGINAL PLANTING GRADE PRIOR TO DIGGING.
9. THE CONTRACTOR SHALL LOCATE, VERIFY, AND MARK ALL EXISTING AND NEWLY INSTALLED UNDERGROUND UTILITIES PRIOR TO ANY LAWN WORK OR PLANTING. ANY CONFLICTS WHICH MIGHT OCCUR BETWEEN PLANTINGS AND UTILITIES SHALL BE IMMEDIATELY REPORTED TO THE OWNER SO THAT ALTERNATE PLANTING LOCATIONS CAN BE DETERMINED.
10. NO SUBSTITUTION OF PLANT MATERIALS SHALL BE ALLOWED WITHOUT THE PRIOR WRITTEN APPROVAL OF THE OWNER.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL PLANTING AND LAWNS AGAINST DAMAGE FROM ONGOING CONSTRUCTION. THIS PROTECTION SHALL BEGIN AT THE TIME THE PLANT IS INSTALLED AND CONTINUE UNTIL THE FORMAL ACCEPTANCE OF ALL THE PLANTINGS.
12. SEE PLANTING DETAILS FOR WEED BARRIER INFORMATION.
13. ALL PLANTING LOCATED AT THE ENTRANCE TO THE PROJECT OR AT INTERSECTIONS WITHIN THE SITE WILL BE MAINTAINED AND WILL NOT EXCEED 3 FEET IN HEIGHT WITHIN A TRIANGLE FORMED 25' INTO THE DRIVEWAY AND 25' ALONG THE TRAVEL WAY.

EROSION CONTROL NOTES:

1. PRIOR TO BEGINNING ANY LAND DISTURBING ACTIVITIES, CLEARING AND GRADING LIMITS SHALL BE STAKED BY THE CONTRACTOR BASED ON THE LIMITS OF GRADING SHOWN ON THE DRAWINGS AND ACCEPTED BY THE OWNER'S REPRESENTATIVE IN THE FIELD. AFTER THE CLEARING AND GRADING LIMITS HAVE BEEN ACCEPTED, THE CONTRACTOR SHALL INSTALL THE PERIMETER SILT FENCES, SEDIMENT BARRIERS AND THE CONSTRUCTION ENTRANCES ASSOCIATED WITH THE PROJECT.
2. ALL GROUND AREAS DISTURBED FOR CONSTRUCTION SHALL BE GRADED, LOAMED, SEEDED AND MULCHED AS SOON AS POSSIBLE. TEMPORARY/PERMANENT SEED MIXTURES SHALL CONFORM TO THE SEEDING PLAN CONTAINED IN THE EROSION CONTROL PROJECT PREPARED FOR THIS PROJECT.
3. PRIOR TO PAVING, THE CONTRACTOR SHALL REMOVE SILT FROM ALL STORM LINES AND APPURTENANCES.
4. ALL STORM DRAIN INLETS AND OUTLETS NOT IN PAVED AREAS ARE TO RECEIVE RIPRAP PROTECTION APRONS DURING CONSTRUCTION.
5. SILT FENCES SHALL BE INSPECTED, REPAIRED AND CLEANED AS NOTED IN THE EROSION CONTROL NOTES SHOWN ON THE EROSION CONTROL DETAIL SHEET.
6. THE CONTRACTOR SHALL REPAIR AND ADD STONE TO THE CONSTRUCTION ENTRANCE AS NECESSARY TO ENSURE THAT IT FUNCTIONS TO CAPTURE MUD FROM THE TIRES OF CONSTRUCTION VEHICLES DURING CONSTRUCTION. THE PURPOSE OF THE CONSTRUCTION ENTRANCE IS TO KEEP ADJACENT STREETS CLEAR OF DIRT AND MUD. SWEEPING OF THE ROADWAYS SHALL BE PERFORMED BY THE CONTRACTOR ON AN AS NEEDED BASIS, BUT AT A MINIMUM ONCE A WEEK.
7. SILT REMOVED FROM AROUND INLETS AND BEHIND THE SILT FENCES SHALL BE PLACED ON A TOPSOIL STOCKPILE AND MIXED INTO TOPSOIL FOR USE IN LANDSCAPING OPERATIONS.
8. LAND DISTURBING ACTIVITIES SHALL BE ACCOMPLISHED IN A MANNER AND SEQUENCE WHICH CAUSE THE LEAST PRACTICAL UNPROTECTED DENUDED AREAS ON THE SITE DURING CONSTRUCTION.
9. THE CONTRACTOR IS CAUTIONED THAT FAILURE TO COMPLY WITH THE SEQUENCE OF CONSTRUCTION, EROSION/SEDIMENT CONTROL PLAN, AND OTHER PERMIT REQUIREMENTS MAY RESULT IN MONETARY PENALTIES AS ENFORCED BY THE MEDEP OR LOCAL AGENCIES. THE CONTRACTOR SHALL BE ASSESSED ALL SUCH PENALTIES AT NO COST TO THE OWNER OR PERMITTEE.
10. A FULL EROSION/SEDIMENTATION CONTROL PLAN ACCOMPANIES THIS DRAWING SET.
11. PROVIDE INLET PROTECTION BARRIERS AROUND ALL EXISTING AND PROPOSED STORM DRAINAGE INLETS AS SHOWN AND MAINTAIN FOR THE DURATION OF THE PROJECT UNTIL PAVEMENT HAS BEEN INSTALLED.
12. INSPECT EROSION AND SEDIMENT CONTROL DEVICES AFTER EACH RAIN STORM OF 0.25 INCHES OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 OF THE STRUCTURE HEIGHT.
13. INSTALL CURLEX EROSION CONTROL MAT OR EQUAL ON ALL SLOPES STEEPER THAN 3:1.
14. THE CONTRACTOR SHALL INSTALL ALL EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES, CUMBERLAND COUNTY SOIL AND WATER CONSERVATION DISTRICT AND MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, OCTOBER 2016".
15. ADDITIONAL EROSION CONTROL MEASURES SHALL BE INSTALLED IF DEEMED NECESSARY BY ON-SITE INSPECTIONS OF THE OWNER, MDEP, THE CITY OF BIDDEFORD, OR THEIR REPRESENTATIVES AT NO ADDITIONAL COST TO THE OWNER.

RECORD DRAWING NOTE:

1. THE CONTRACTOR SHALL PROVIDE RECORD INFORMATION OF WORK COMPLETED IN ORDER TO SATISFY THE RECORD DRAWING REQUIREMENTS OF THE CITY OF BIDDEFORD.

EXISTING

	BOUNDARY LINE/R.O.W.
	ABUTTER LINE/R.O.W.
	DEED LINE/ROW
	TIE LINE
	EASEMENT
	FLOODPLAIN
	CENTERLINE
	IRON PIPE/ROD
	BENCHMARK
	BUILDING
	SIGN
	EDGE PAVEMENT
	CONTOURS
	SPOT GRADE
	CHAIN LINK FENCE
	DECIDUOUS TREE
	CONIFEROUS TREE
	GUARDRAIL
	WATER GATE VALVE
	HYDRANT
	WATER MAIN
	SANITARY SEWER
	STORM DRAIN
	MANHOLE (AS LABELLED)
	CATCH BASIN
	UNIDENTIFIED MH
	OVERHEAD UTILITY
	ELECTRIC METER BOX
	LIGHT POLE
	UTILITY POLE
	GUY
	BOULDER
	BORING LOCATION BY SUMMIT GEOENGINEERING
	ZONING DISTRICT BOUNDARY
	WETLANDS DELINEATED BY FLYCATCHER, LLC
	STREAM
	TEST PIT

PROPOSED

	BARRIER FREE SYMBOL
	SIGN
	SIGN LABEL
	GUIDERAIL - METAL
	GUIDERAIL - TIMBER
	FENCE - CHAINLINK
	FENCE - WOOD
	BUILDING / BUILDING ACCESS
	PROPERTY LINE
	CONDOMINIUM LOT LINE
	RETAINING WALL
	PEDESTRIAN CROSSWALK
	TRAFFIC ARROWS
	BOLLARD
	SLIPFORM CONCRETE CURB
	BITUMINOUS CURB
	CATCH BASIN
	CONTOUR LABEL
	DRAIN MANHOLE
	RIPRAP INLET APRON
	RIPRAP OUTLET APRON
	SLOPE DESIGNATION
	SPOT GRADE
	SPOT GRADE AT CURB (TC=TOP / BC=BOTTOM)
	WATER MARK
	UNDERDRAIN
	STORM DRAIN
	TREE LINE OR LIMIT OF CLEARING
	CURB STOP
	HYDRANT
	LIGHT POLE WITH FIXTURE(S)
	WALL MOUNT LIGHT
	SANITARY SEWER MANHOLE
	TEST PIT
	TRANSFORMER PAD
	UTILITY POLE
	VALVE
	SANITARY SEWER
	WATER MAIN
	GAS MAIN
	UNDERGROUND ELECTRIC
	OVERHEAD ELECTRIC
	TRAIL
	SNOW STORAGE
	CLEARING LIMIT LINE

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Rev.	Date	Revision

Rev.	Date	Revision
3	2024.07.17	FINAL PLAN SUBMISSION TO CITY OF BIDDEFORD
2	2024.06.26	PRELIMINARY PLAN SUBMISSION TO CITY OF BIDDEFORD
1	2024.06.18	FOR CLIENT REVIEW

Design: KAB	Draft: CDD	Date: JUNE 2024
Checked: SRB	Scale: AS NOTED	Job No.: 4303
File Name: 4303-COVER.dwg		
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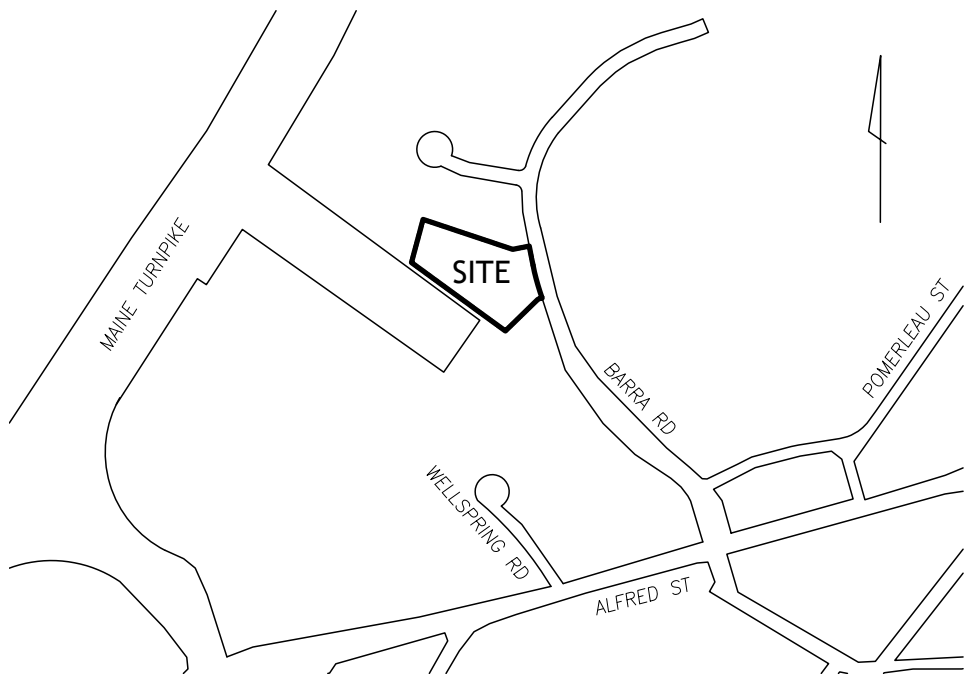
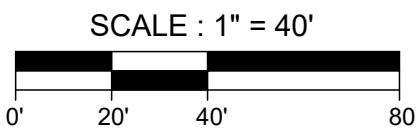
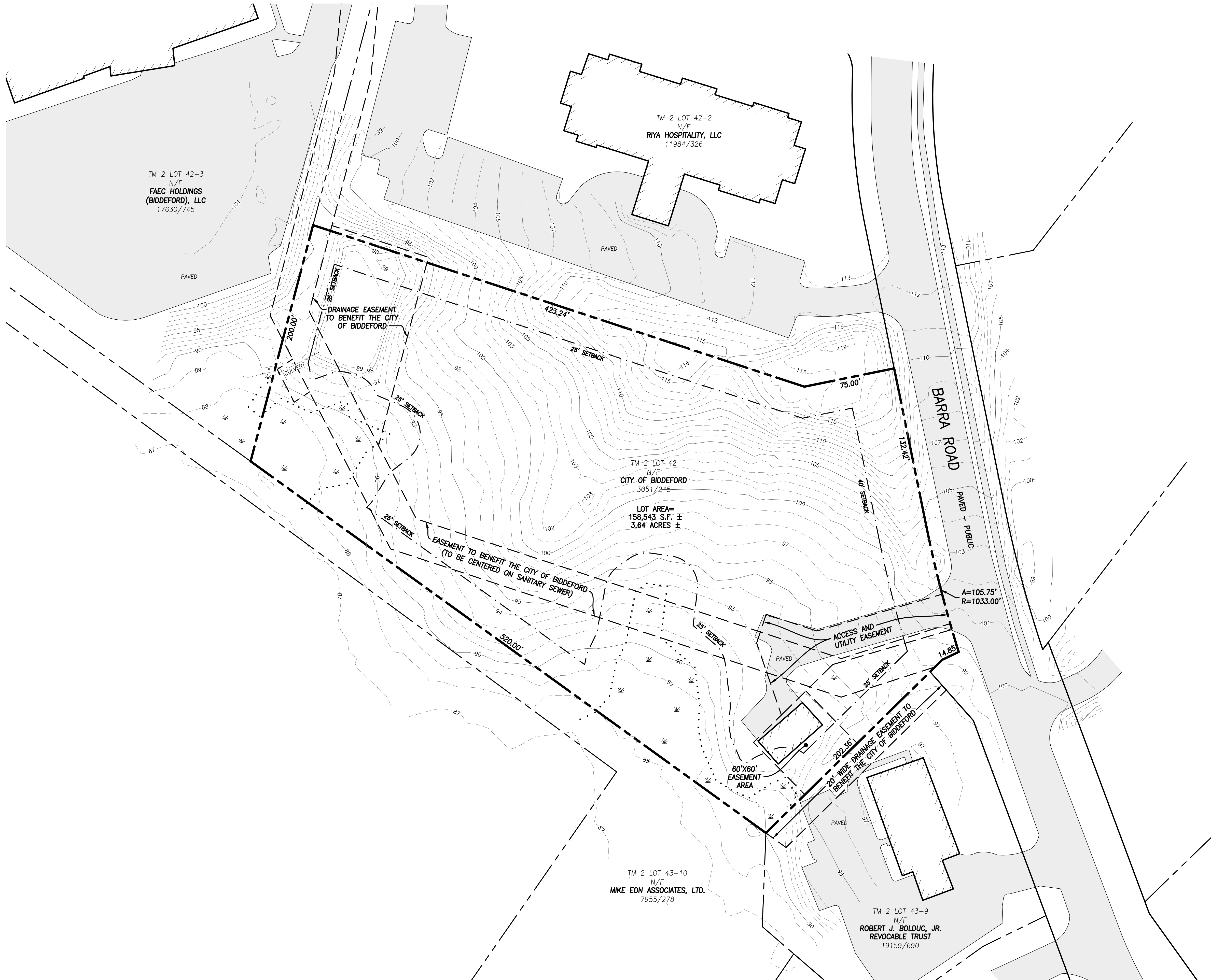
Gorriil Palmer, an LJB Engineering Company
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(207) 772-2515
300 Southborough Drive - Suite 200
South Portland, ME 04106

Drawing Name:	GENERAL NOTES AND LEGEND
Project:	PROPOSED RESIDENTIAL DEVELOPMENT 37 BARRA ROAD, BIDDEFORD, MAINE
Client:	WESTBROOK DEVELOPMENT CORPORATION 30 LIZA HARMON DRIVE, WESTBROOK, ME 04092

Drawing No.
C-1.1

NOTE: THIS PLAN SET IS ISSUED FOR PERMITTING PURPOSES & SHALL NOT BE USED FOR CONSTRUCTION.

KALEB A. BOURASSA, P.E.
LIC. #17072



LOCATION MAP N.T.S.

LEGEND	
---	SETBACK LINE
- - -	EASEMENT LINE
.....	EDGE OF WETLAND
100	1" CONTOUR

PLAN REFERENCES

- "CITY OF BIDDEFORD, 205 MAIN STREET, BIDDEFORD, MAINE - FIFTH AMENDED SUBDIVISION PLAN", SEPTEMBER 12, 2024, BY OWEN HASKELL, INC., RECORDED AT YORK COUNTY REGISTRY OF DEEDS (Y.C.R.D.) IN PLAN BOOK 371, PAGE 50.
- "AMENDED SUBDIVISION PLAN OF: LOT 1 - EXIT 4 BUSINESS PARK, BARRA ROAD, BIDDEFORD, MAINE - FOR: VERIZON NEW ENGLAND, INC.", NOVEMBER 21, 2000, BY SEBAGO TECHNICS.
- "RECORD PLAN OF THE: EXIT 4 BUSINESS PARK PCH, BARRA ROAD, BIDDEFORD, MAINE - FOR: VERIZON NEW ENGLAND, INC.", NOVEMBER 14, 2000, BY SEBAGO TECHNICS, RECORDED AT Y.C.R.D. IN PLAN BOOK 260, PAGE 11.
- SITE PLAN, COMMERCIAL SITE, 35 BARRA ROAD, BIDDEFORD, MAINE", JUNE 2011, BY BH2M, RECORDED AT Y.C.R.D. IN PLAN BOOK 354, PAGE 25.
- SUBDIVISION PLAN, 3 LOT SUBDIVISION, BARRA ROAD, BIDDEFORD, MAINE", JUNE 2013, BY BH2M, RECORDED AT Y.C.R.D. IN PLAN BOOK 362, PAGE 30.

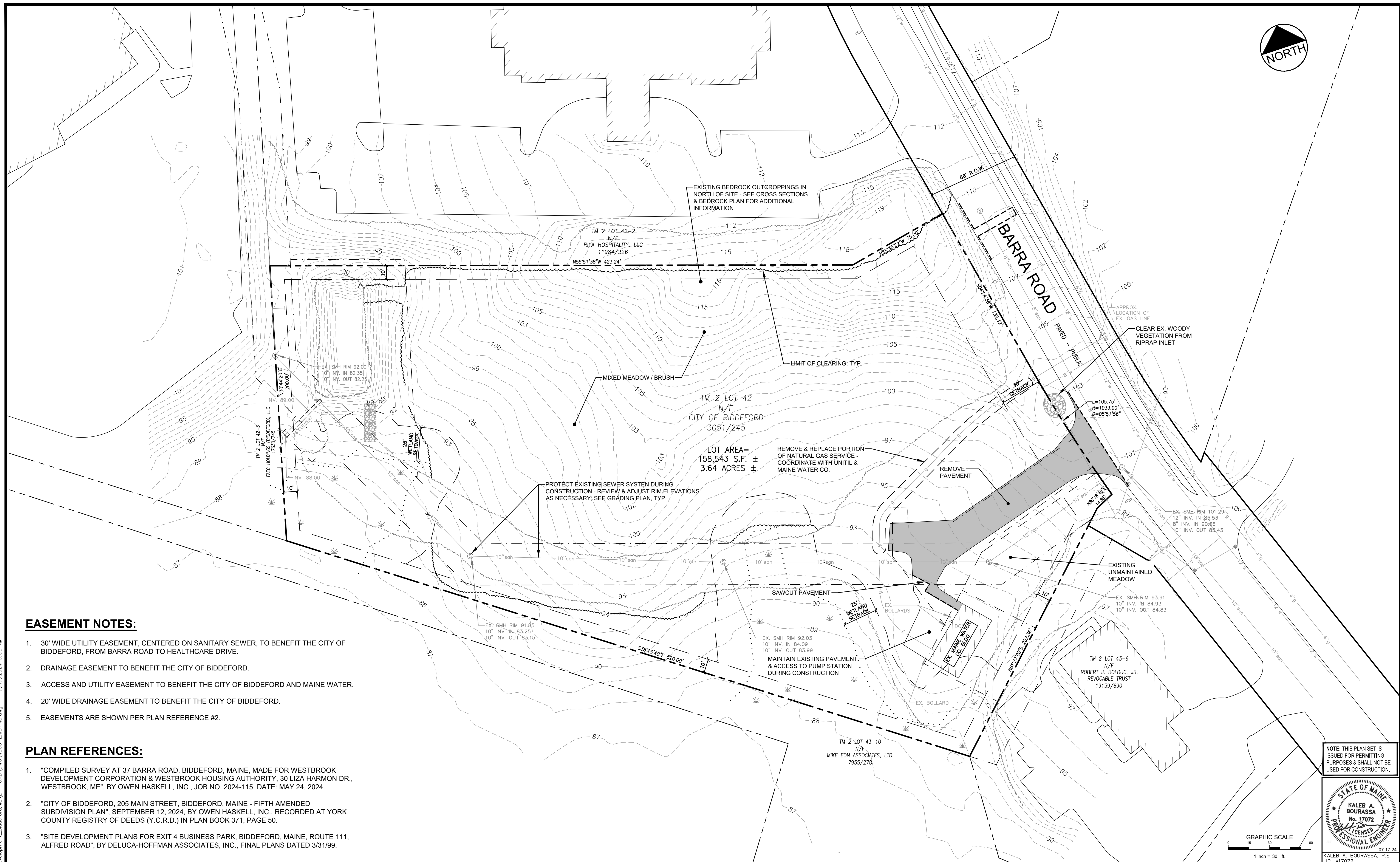
GENERAL NOTES

- OWNER OF RECORD: CITY OF BIDDEFORD
TAX MAP 2 LOT 42
Y.C.R.D. BOOK 3051 PAGE 245
- BEARINGS ARE BASED ON STATE PLAN COORDINATE SYSTEM, MAINE WEST ZONE, NAD 83.
- ELEVATIONS ARE BASED ON NAVD 88 DATUM, DERIVED FROM 2020 LIDAR DATA PROVIDED VIA [HTTPS://COAST.NOAA.GOV/DATAVIEWER/](https://coast.noaa.gov/dataviewer/).
- THE PURPOSE OF THIS PLAN IS TO SHOW THE APPROXIMATE BOUNDARY OF THE LOCUS PARCEL AND ITS RELATION TO EXISTING FEATURES AND TOPOGRAPHIC DATA.
- THE LOCUS PARCEL IS ENTIRELY WITHIN AN INDUSTRIAL 3 (I3) ZONE WITH THE FOLLOWING DIMENSIONAL REQUIREMENTS:
FRONT SETBACK: 40 FEET
SIDE/REAR SETBACK: 25 FEET
WETLAND SETBACK: 25 FEET
- ACCORDING TO FEMA'S FLOOD INSURANCE RATE MAP 2301450008B, W/ EFFECTIVE DATE MAY 15, 1984, THE LOCUS PARCEL IS ZONE C (AREA OF MINIMAL FLOODING)
- THE BOUNDARY OF THE LOCUS PARCELS SOLELY BASED ON PLAN REFERENCE #1. THIS IS NOT A BOUNDARY SURVEY.
- WETLAND'S WERE DELINEATED MAY 22, 2024 BY FLYCATCHER, LLC.
- BUILDINGS AND PAVEMENT SHOWN ARE BASED ON AERIAL PHOTOGRAPHY.
- THE LOCUS PARCEL IS SUBJECT TO AN ACCESS & UTILITY EASEMENT AND A 60'X60' EASEMENT AREA, SHOWN PER PLAN REFERENCE #1. THE STATUS OF SAID EASEMENTS ARE UNKNOWN.
- THE EASEMENTS LABELED "TO BENEFIT THE CITY OF BIDDEFORD" ARE SHOWN PER PLAN REFERENCE #1. THE STATUS OF SAID EASEMENTS ARE UNKNOWN.

Compiled Survey
At
37 Barra Road, Biddeford, Maine
Made for
Westbrook Development Corporation
& Westbrook Housing Authority
30 Liza Harmon Dr, Westbrook, ME

**OWEN HASKELL, INC.**
PROFESSIONAL LAND SURVEYORS
390 US ROUTE 1, UNIT 10, FALMOUTH, ME 04105 TEL. 207-774-0424

DRAWN BY: JWS	DATE: MAY 24, 2024	JOB NO. 2024-115
CHECKED BY: RRL	SCALE: 1" = 40'	DRWG. NO. 1



EASEMENT NOTES:

1. 30' WIDE UTILITY EASEMENT, CENTERED ON SANITARY SEWER, TO BENEFIT THE CITY OF BIDDEFORD, FROM BARRA ROAD TO HEALTHCARE DRIVE.
2. DRAINAGE EASEMENT TO BENEFIT THE CITY OF BIDDEFORD.
3. ACCESS AND UTILITY EASEMENT TO BENEFIT THE CITY OF BIDDEFORD AND MAINE WATER
4. 20' WIDE DRAINAGE EASEMENT TO BENEFIT THE CITY OF BIDDEFORD.
5. EASEMENTS ARE SHOWN PER PLAN REFERENCE #2.

PLAN REFERENCES:

1. "COMPILED SURVEY AT 37 BARRA ROAD, BIDDEFORD, MAINE, MADE FOR WESTBROOK DEVELOPMENT CORPORATION & WESTBROOK HOUSING AUTHORITY, 30 LIZA HARMON DR., WESTBROOK, ME", BY OWEN HASKELL, INC., JOB NO. 2024-115, DATE: MAY 24, 2024.
2. "CITY OF BIDDEFORD, 205 MAIN STREET, BIDDEFORD, MAINE - FIFTH AMENDED SUBDIVISION PLAN", SEPTEMBER 12, 2024, BY OWEN HASKELL, INC., RECORDED AT YORK COUNTY REGISTRY OF DEEDS (Y.C.R.D.) IN PLAN BOOK 371, PAGE 50.
3. "SITE DEVELOPMENT PLANS FOR EXIT 4 BUSINESS PARK, BIDDEFORD, MAINE, ROUTE 111, ALFRED ROAD", BY DELUCA-HOFFMAN ASSOCIATES, INC., FINAL PLANS DATED 3/31/99.

Revising Data Node		
Rev.	Date	Revision

3	2024.07.17	FINAL PLAN SUBMISSION TO CITY OF BIDDEFORD
2	2024.06.26	PRELIMINARY PLAN SUBMISSION TO CITY OF BIDDEFORD
1	2024.06.18	FOR CLIENT REVIEW
Rev.	Date	Revision

Design: KAB	Draft: CDD	Date: JUNE 2024
Checked: SRB	Scale: AS NOTED	Job No.: 4303
File Name: 4303-EXISTING.dwg		

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GorrillPalmer.com
(207) 772-2515
300 Southborough Drive - Suite 200
South Portland, ME 04106

Drawing Name: EXISTING CONDITIONS & REMOVALS PLAN	
Project:	PROPOSED RESIDENTIAL DEVELOPMENT 37 BARRA ROAD, BIDDEFORD, MAINE
Client:	WESTBROOK DEVELOPMENT CORPORATION 30 LIZA HARMON DRIVE, WESTBROOK, ME 04092

Drawing No.

C-2.0

1. THIS PLAN DEPICTS INFORMATION FROM THE EXISTING BEDROCK CONTOUR PLAN SUBMITTED MARCH OF 1999 TO THE CITY OF BIDDEFORD. THE PLAN REPRESENTS THE RESULTS OF A BEDROCK SURFACE DELINEATION BY R.W. GILLESPIE & ASSOCIATES. THE CONTRACTOR IS CAUTIONED THAT BEDROCK CONTOURS SHOWN ON THIS PLAN AND AT OTHER LOCATIONS WITHIN THE PLAN SET ARE BASED ON DATA IN THE BEDROCK SURFACE DELINEATION AND ARE THE RESULTS OF GENERAL INTERPOLATION BETWEEN BORINGS AND TEST PITS. THE INTENT OF THIS PLAN IS SPECIFICALLY FOR THE USE OF THE PROJECT TEAM FOR PLANNING AND SITE DEVELOPMENT OPTIONS. ACTUAL CONDITIONS OUTSIDE OF THE IMMEDIATE BORINGS AND TEST PITS MAY VARY.

1. "COMPILED SURVEY AT 37 BARRA ROAD, BIDDEFORD, MAINE, MADE FOR WESTBROOK DEVELOPMENT CORPORATION & WESTBROOK HOUSING AUTHORITY, 30 LIZA HARMON DR., WESTBROOK, ME", BY OWEN HASKELL, INC., JOB NO. 2024-115, DATE: MAY 24, 2024.
2. "SITE DEVELOPMENT PLANS FOR EXIT 4 BUSINESS PARK, BIDDEFORD, MAINE, ROUTE 111, ALFRED ROAD", BY DELUCA-HOFFMAN ASSOCIATES, INC., FINAL PLANS DATED 3/31/99.

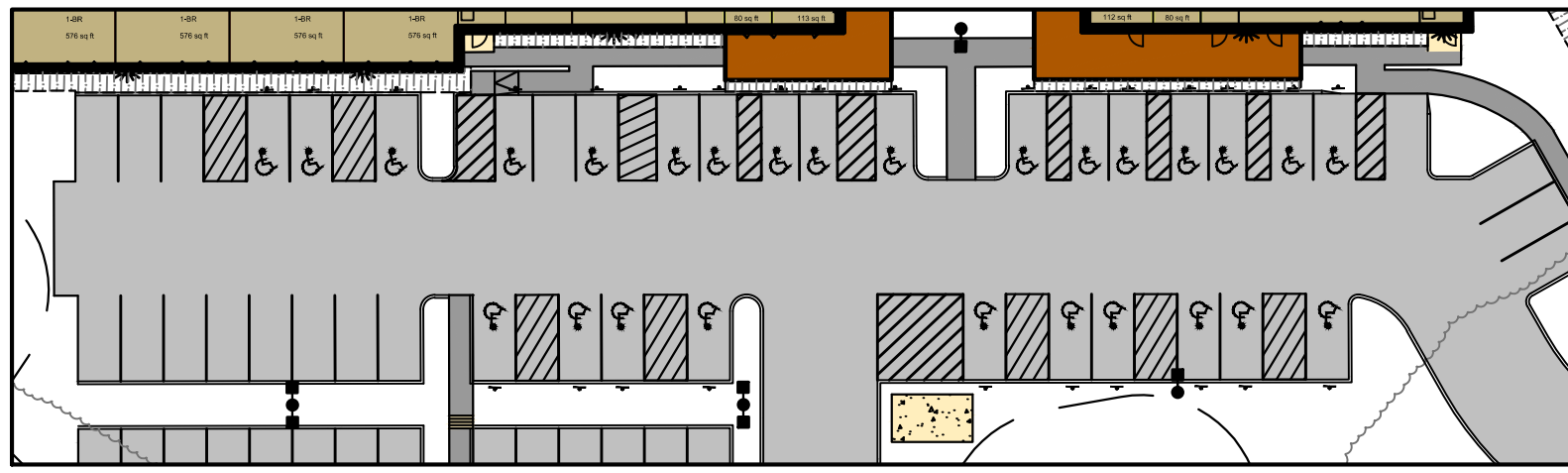
3	2024.07.17	FINAL PLAN SUBMISSION TO CITY OF BIDDEFORD
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1	2024.06.18	FOR CLIENT REVIEW
Rev.	Date	Revision

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Drawing No.

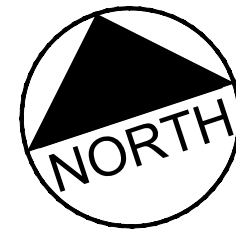
C-2.1

U:\4303-WHA Barra Road Development_Biddeford,ME - CAD\DWG\4303-SITE.dwg 7/17/2024 12:57 PM



POTENTIAL ALTERNATIVE ADA PARKING

SCALE: 1" = 40'



GRAPHIC SCALE
0 15 30 60
1 inch = 30 ft.

CITY OF BIDDEFORD SITE / SUBDIVISION
APPROVAL

CHAIRMAN _____

DATE _____

STATE OF MAINE

YORK COUNTY REGISTRY OF DEEDS

RECEIVED _____ 20____

AT _____h _____m _____M. AND RECORDED IN

PLAN BOOK _____PAGE _____

ATTEST _____

REGISTER

PARKING SUMMARY

	PROVIDED
TOTAL SPACES	95
ACCESSIBLE SPACES	9
VAN ACCESSIBLE SPACES	2

SPACE AND BULK STANDARDS
13 - INDUSTRIAL COMMERCIAL ZONE /
CONTRACT ZONE

	REQUIRED / ALLOWED	PROVIDED
MIN. LOT AREA	N / A	3.64 ACRES
MIN. LOT FRONTAGE	50 FT	238 FT
MIN. BLDG. SETBACKS		
FRONT	30 FT	30 FT
SIDE	10 FT	30 FT
REAR	10 FT	51 FT
MIN. PARKING/PVMT SETBACKS		
FRONT	20 FT	20 FT
SIDE / REAR	0 FT	9 FT
MAX. BUILDING HEIGHT	6 STORIES OR 60 FT	4 STORIES OR < 60 FT
MAX. IMPERVIOUS COVERAGE PER LOT	75% OR 118,918 SF	70,501 SF

PROJECT OWNERSHIP:

BUILDING #1 - THATCHER BROOK APARTMENTS I, LP
BUILDING #2 - THATCHER BROOK APARTMENTS II, LP

CURRENT PROPERTY OWNER OF RECORD:

CITY OF BIDDEFORD
C.C.R.D. BOOK 3051, PAGE 245

PLAN REFERENCES:

- "COMPILED SURVEY AT 37 BARRA ROAD, BIDDEFORD, MAINE, MADE FOR WESTBROOK DEVELOPMENT CORPORATION & WESTBROOK HOUSING AUTHORITY, 30 LIZA HARMON DR., WESTBROOK, ME", BY OWEN HASKELL, INC., JOB NO. 2024-115, DATE: MAY 24, 2024.
- "CITY OF BIDDEFORD, 205 MAIN STREET, BIDDEFORD, MAINE - FIFTH AMENDED SUBDIVISION PLAN", SEPTEMBER 12, 2024, BY OWEN HASKELL, INC., RECORDED AT YORK COUNTY REGISTRY OF DEEDS (Y.C.R.D.) IN PLAN BOOK 371, PAGE 50.
- "SITE DEVELOPMENT PLANS FOR EXIT 4 BUSINESS PARK, BIDDEFORD, MAINE, ROUTE 111, ALFRED ROAD", BY DELUCA-HOFFMAN ASSOCIATES, INC., FINAL PLANS DATED 3/31/99.

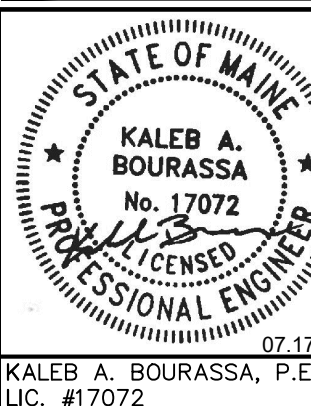
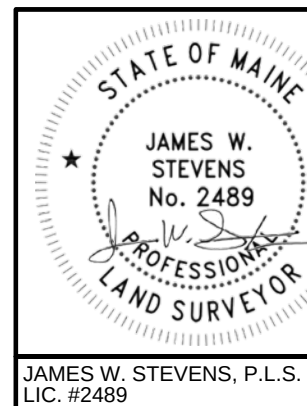
EASEMENT NOTES:

- 30' WIDE UTILITY EASEMENT, CENTERED ON SANITARY SEWER, TO BENEFIT THE CITY OF BIDDEFORD, FROM BARRA ROAD TO HEALTHCARE DRIVE.
- DRAINAGE EASEMENT TO BENEFIT THE CITY OF BIDDEFORD.
- ACCESS AND UTILITY EASEMENT TO BENEFIT THE CITY OF BIDDEFORD AND MAINE WATER.
- 20' WIDE DRAINAGE EASEMENT TO BENEFIT THE CITY OF BIDDEFORD.
- EASEMENTS ARE SHOWN PER PLAN REFERENCE #2.

NOTES:

- MULTIPLE BUILDINGS AND DWELLING UNITS SHALL BE ALLOWED ON THE SAME LOT SUBJECT TO THE SPACE AND BULK REQUIREMENTS.
- WETLANDS WERE DELINEATED BY FLYCATCHER, LLC IN MAY 2024.
- MAINTAIN ACCESS TO MAINE WATER COMPANY BUILDING AT ALL TIMES DURING AND POST-CONSTRUCTION.
- THE PROJECT MAY BE BUILT IN ONE OR MORE PHASES DEPENDENT UPON AVAILABILITY OF COMPETITIVE FUNDING FROM MAINEHOUSING AND OTHER SOURCES. SEE SHEET C-3.2 - PHASING PLAN FOR POTENTIAL PHASING SCENARIOS.
- EACH BUILDING IS ANTICIPATED TO BE OWNED AND FINANCED SEPARATELY THROUGH A TWO (2) UNIT LAND CONDOMINIUM. THE OWNERSHIP ENTITIES FOR EACH BUILDING ARE PROVIDED IN THE PROJECT OWNERSHIP TABLE ON THIS SHEET.
- THE SPACE & BULK STANDARDS ARE SUBJECT TO A PROPOSED CONTRACT ZONE UNDER CONCURRENT REVIEW WITH THE CITY OF BIDDEFORD PLANNING BOARD. IT IS ANTICIPATED THAT A CONDITION OF APPROVAL WILL BE CONVEYED WITH THIS PROJECT REQUIRING APPROVAL OF THE CONTRACT ZONE FROM THE CITY COUNCIL PRIOR TO ANY FURTHER DEVELOPMENT/WORK.
- PROJECT SIGNAGE MAY INCLUDE BUILDING MOUNTED LETTERING FOR THE PROJECT ADDRESSES WHICH WILL BE SUBMITTED TO THE PLANNING DEPARTMENT AND/OR CODE ENFORCEMENT AT THE TIME OF THE BUILDING PERMIT SUBMISSION. NO STAND ALONE SIGNAGE IS PROPOSED ON SITE.

NOTE: THIS PLAN SET IS
ISSUED FOR PERMITTING
PURPOSES & SHALL NOT BE
USED FOR CONSTRUCTION.



JAMES W. STEVENS, P.L.S.
LIC. #2489

07.17.24
KALEB A. BOURASSA, P.E.
LIC. #17072

Design: KAB Draft: CDD Date: JUNE 2024
Checked: SRB Scale: AS NOTED Job No.: 4303
File Name: 4303-SITE.dwg

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South Portland, ME 04106

Drawing Name:

OVERALL SITE / SUBDIVISION PLAN

Project:

PROPOSED RESIDENTIAL DEVELOPMENT
37 BARRA ROAD, BIDDEFORD, MAINE

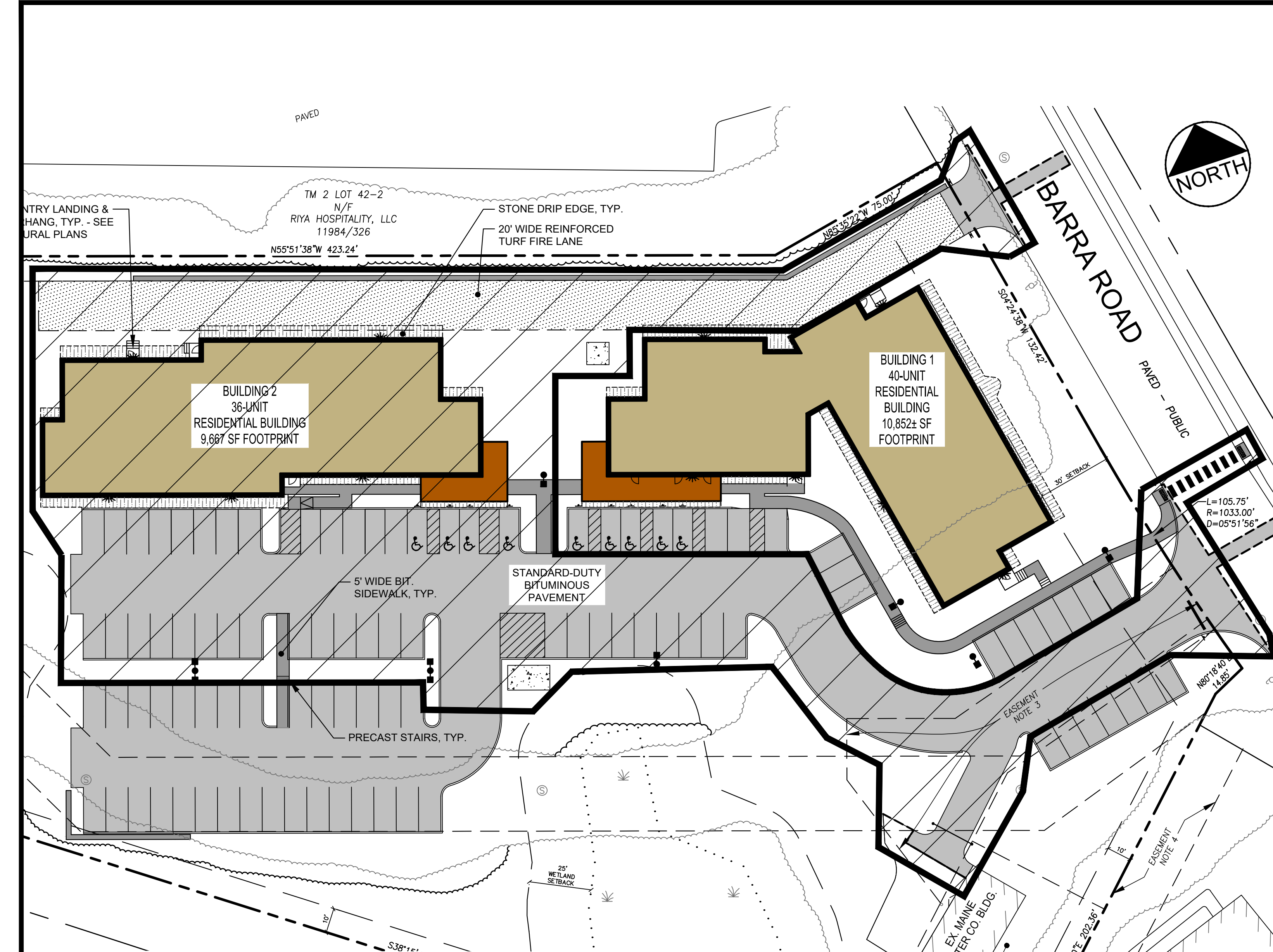
Client:

WESTBROOK DEVELOPMENT CORPORATION
30 LIZA HARMON DRIVE, WESTBROOK, ME 04092

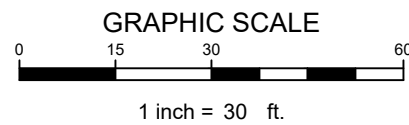
Drawing No.

C-3.0

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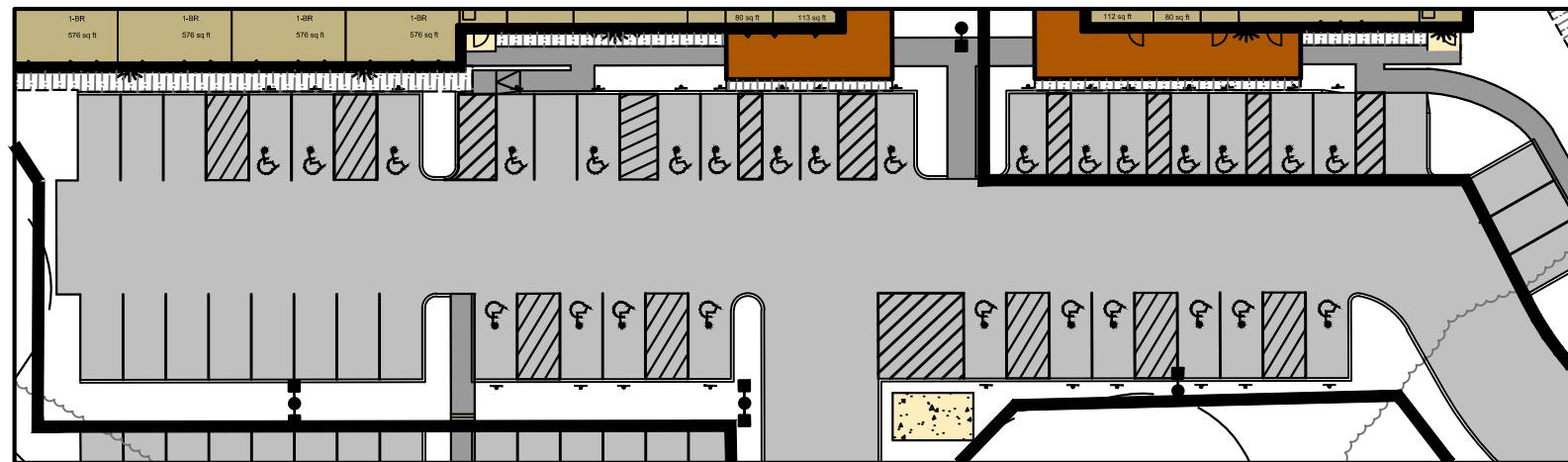


PHASING OPTION #2 - SENIOR BUILDING



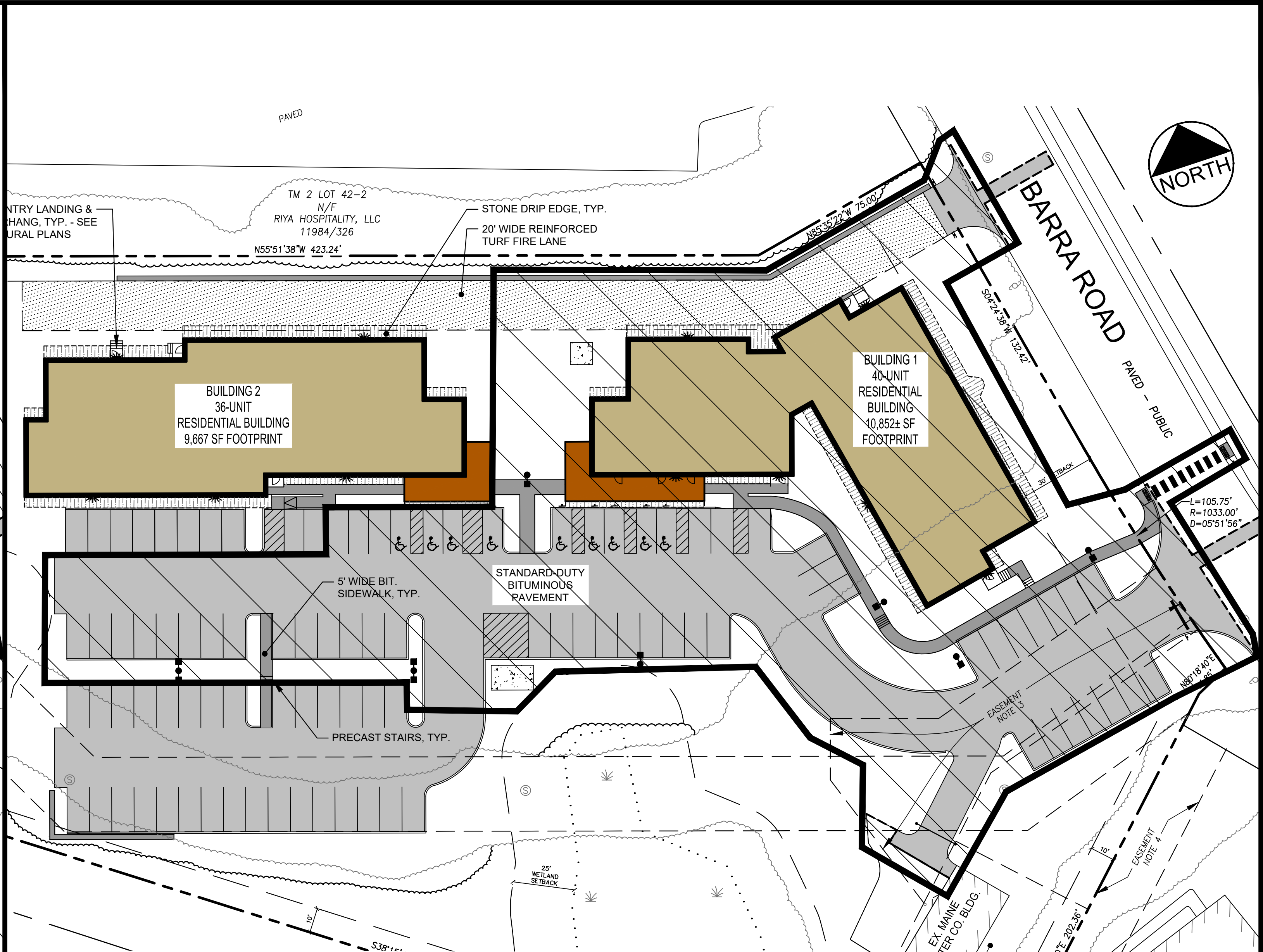
INCLUDES:

- 40 PARKING SPACES
- FIRE TRUCK ACCESS & UTILITIES FOR SENIOR BUILDING - STUBS FOR FAMILY BLDG.
- MAIN DRIVEWAY AND LIGHTING
- DRAINAGE FOR PRIMARY PARKING AREA AND CONNECTION TO EX. POND
- LEAVE SPACES AROUND FAMILY BLDG. FOR FUTURE CONSTRUCTABILITY
- LOWER PARKING NOT NECESSARY BUT CAN BE USED FOR STAGING / STOCKPILING

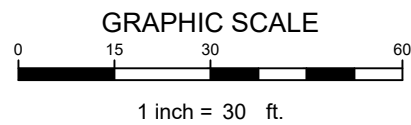


POTENTIAL ALTERNATIVE ADA PARKING

SCALE: 1" = 40'

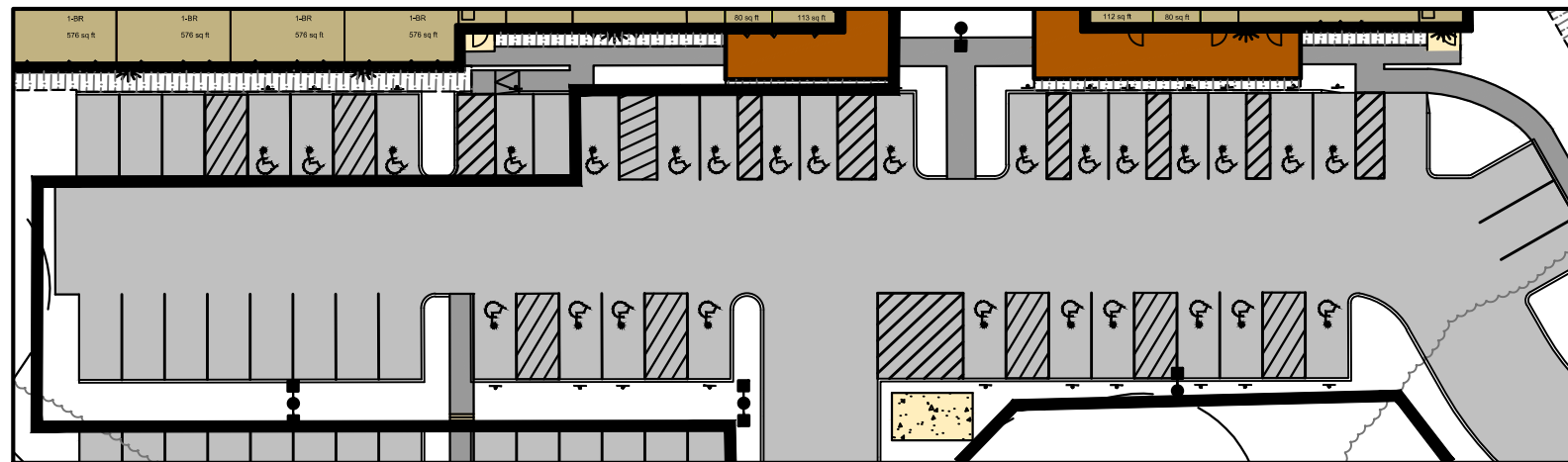


PHASING OPTION #1 - FAMILY BUILDING



INCLUDES:

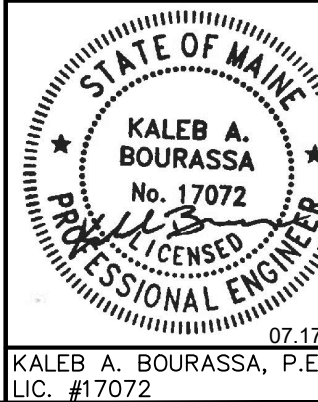
- 55 PARKING SPACES
- FIRE TRUCK ACCESS & UTILITIES FOR FAMILY BUILDING
- DRAINAGE FOR PRIMARY PARKING AREA AND CONNECTION TO EX. POND
- LEAVE SPACES AROUND SENIOR BLDG. FOR FUTURE CONSTRUCTABILITY
- LOWER PARKING NOT NECESSARY BUT CAN BE USED FOR STAGING / STOCKPILING



POTENTIAL ALTERNATIVE ADA PARKING

SCALE: 1" = 40'

NOTE: THIS PLAN SET IS ISSUED FOR PERMITTING PURPOSES & SHALL NOT BE USED FOR CONSTRUCTION.



KALEB A. BOURASSA, P.E.
LIC. #17072

Rev.	Date	Revision

Rev.	Date	Revision
3	2024.07.17	FINAL PLAN SUBMISSION TO CITY OF BIDDEFORD
2	2024.06.26	PRELIMINARY PLAN SUBMISSION TO CITY OF BIDDEFORD
1	2024.06.18	FOR CLIENT REVIEW

Design: KAB Draft: CDD Date: JUNE 2024
Checked: SRB Scale: AS NOTED Job No.: 4303
File Name: 4303-SITE.dwg

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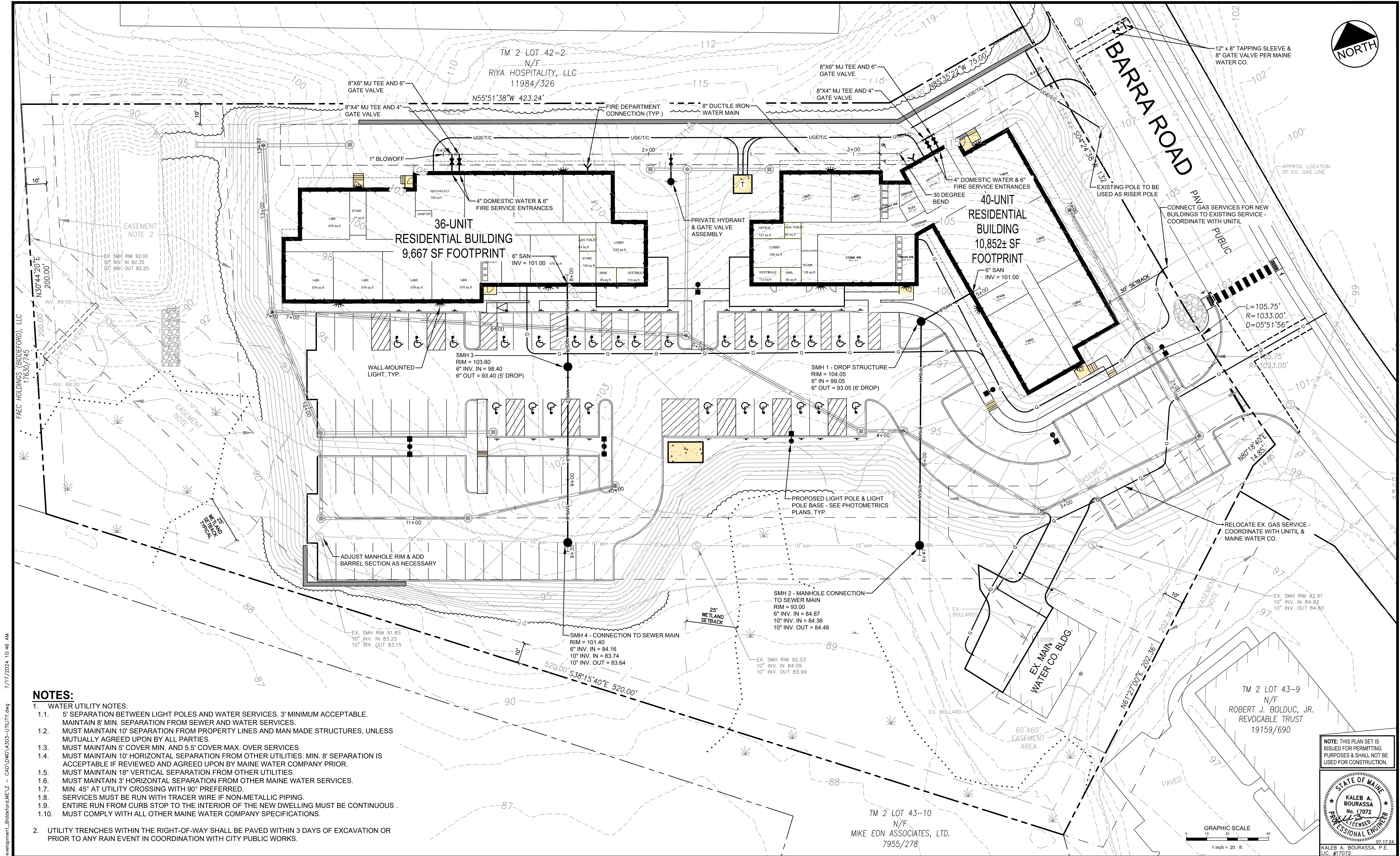


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South Portland, ME 04106

Drawing Name:	PHASING PLAN
Project:	PROPOSED RESIDENTIAL DEVELOPMENT 37 BARRA ROAD, BIDDEFORD, MAINE
Client:	WESTBROOK DEVELOPMENT CORPORATION 30 LIZA HARMON DRIVE, WESTBROOK, ME 04092

Drawing No.

C-3.2



NOTES:

- WATER UTILITY NOTES:
 - 5' SEPARATION BETWEEN LIGHT POLES AND WATER SERVICES. 3' MINIMUM ACCEPTABLE. MAINTAIN 8' MIN. SEPARATION FROM SEWER AND WATER SERVICES.
 - MUST MAINTAIN 10' SEPARATION FROM PROPERTY LINES AND MAN MADE STRUCTURES, UNLESS MUTUALLY AGREED UPON BY ALL PARTIES.
 - MUST MAINTAIN 5' COVER MIN. AND 5.5' COVER MAX. OVER SERVICES.
 - MUST MAINTAIN 10' HORIZONTAL SEPARATION FROM OTHER UTILITIES. MIN. 8' SEPARATION IS ACCEPTABLE IF REVIEWED AND AGREED UPON BY MAINE WATER COMPANY PRIOR.
 - MUST MAINTAIN 18" VERTICAL SEPARATION FROM OTHER UTILITIES.
 - MUST MAINTAIN 3' HORIZONTAL SEPARATION FROM OTHER MAINE WATER SERVICES.
 - MIN. 45' AT UTILITY CROSSING WITH 90° PREFERRED.
 - SERVICES MUST BE RUN WITH TRACER WIRE IF NON-METALLIC PIPING.
 - ENTIRE RUN FROM CURB STOP TO THE INTERIOR OF THE NEW DWELLING MUST BE CONTINUOUS.
 - MUST COMPLY WITH ALL OTHER MAINE WATER COMPANY SPECIFICATIONS.
- UTILITY TRENCHES WITHIN THE RIGHT-OF-WAY SHALL BE PAVED WITHIN 3 DAYS OF EXCAVATION OR PRIOR TO ANY RAIN EVENT IN COORDINATION WITH CITY PUBLIC WORKS.

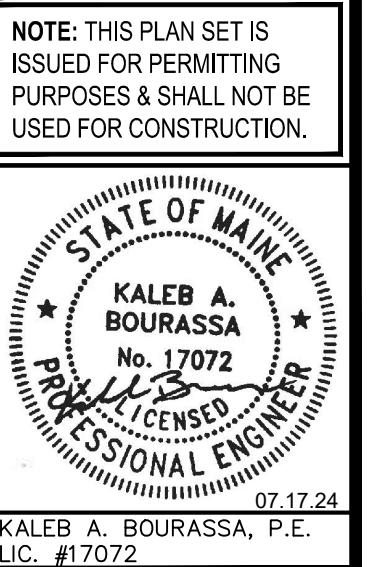
Design: KAB	Draft: CDD	Date: JUNE 2024
Checked: SRB	Scale: AS NOTED	Job No.: 4303
File Name: 4303-UTILITY.dwg		
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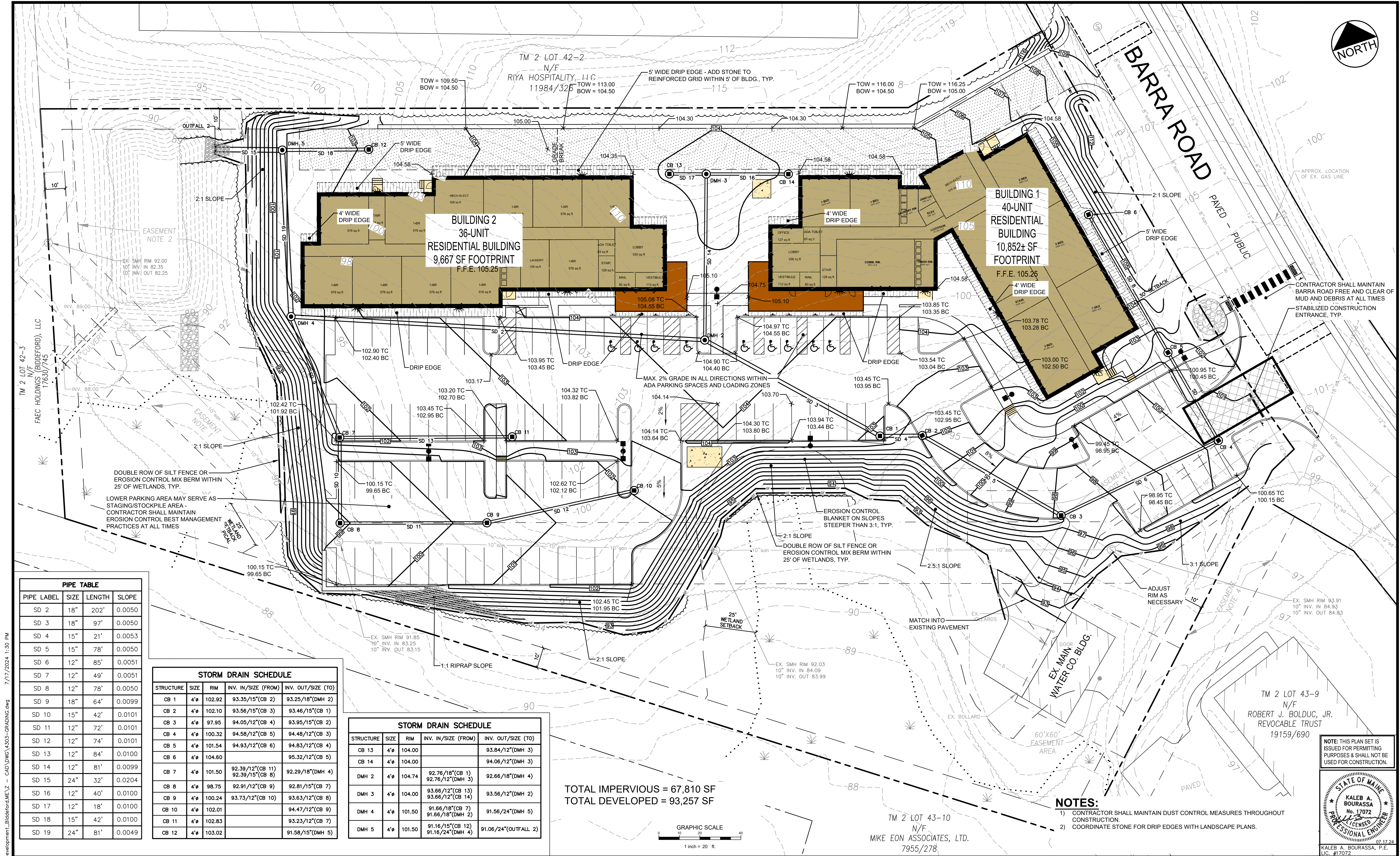


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South Portland, ME 04106

Drawing Name:	UTILITY PLAN
Project:	PROPOSED RESIDENTIAL DEVELOPMENT 37 BARRA ROAD, BIDDEFORD, MAINE
Client:	WESTBROOK DEVELOPMENT CORPORATION 30 LIZA HARMON DRIVE, WESTBROOK, ME 04092

Drawing No.	C-4.0
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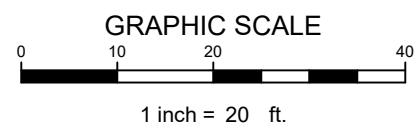


PIPE TABLE			
PIPE LABEL	SIZE	LENGTH	SLOPE
SD 2	18"	202'	0.0050
SD 3	18"	97'	0.0050
SD 4	15"	21'	0.0053
SD 5	15"	78'	0.0050
SD 6	12"	85'	0.0051
SD 7	12"	49'	0.0051
SD 8	12"	78'	0.0050
SD 9	18"	64'	0.0099
SD 10	15"	42'	0.0101
SD 11	12"	72'	0.0101
SD 12	12"	74'	0.0101
SD 13	12"	84'	0.0100
SD 14	12"	81'	0.0099
SD 15	24"	32'	0.0204
SD 16	12"	40'	0.0100
SD 17	12"	18'	0.0100
SD 18	15"	42'	0.0100
SD 19	24"	81'	0.0049

STORM DRAIN SCHEDULE				
STRUCTURE	SIZE	RIM	INV. IN/SIZE (FROM)	INV. OUT/SIZE (TO)
CB 1	4"	102.92	93.35/15"(CB 2)	93.25/18"(DMH 2)
CB 2	4"	102.10	93.56/15"(CB 3)	93.46/15"(CB 1)
CB 3	4"	97.95	94.05/12"(CB 4)	93.95/15"(CB 2)
CB 4	4"	100.32	94.58/12"(CB 5)	94.48/12"(CB 3)
CB 5	4"	101.54	94.93/12"(CB 6)	94.83/12"(CB 4)
CB 6	4"	104.60		95.32/12"(CB 5)
CB 7	4"	101.50	92.39/12"(CB 11) 92.39/15"(CB 8)	92.29/18"(DMH 4)
CB 8	4"	98.75	92.91/12"(CB 9)	92.81/15"(CB 7)
CB 9	4"	100.24	93.73/12"(CB 10)	93.63/12"(CB 8)
CB 10	4"	102.01		94.47/12"(CB 9)
CB 11	4"	102.83		93.23/12"(CB 7)
CB 12	4"	103.02		91.58/15"(DMH 5)

STORM DRAIN SCHEDULE				
STRUCTURE	SIZE	RIM	INV. IN/SIZE (FROM)	INV. OUT/SIZE (TO)
CB 13	4"	104.00		93.84/12"(DMH 3)
CB 14	4"	104.00		94.06/12"(DMH 3)
DMH 2	4"	104.74	92.76/18"(CB 1) 92.76/12"(DMH 3)	92.66/18"(DMH 4)
DMH 3	4"	104.00	93.66/12"(CB 13) 93.66/12"(CB 14)	93.56/12"(DMH 2)
DMH 4	4"	101.50	91.66/18"(CB 7) 91.66/18"(DMH 2)	91.56/24"(DMH 5)
DMH 5	4"	101.50	91.16/15"(CB 12) 91.16/24"(DMH 4)	91.06/24"(OUTFALL 2)

TOTAL IMPERVIOUS = 67,810 SF
TOTAL DEVELOPED = 93,257 SF



NOTES:

- 1) CONTRACTOR SHALL MAINTAIN DUST CONTROL MEASURES THROUGHOUT CONSTRUCTION.
- 2) COORDINATE STONE FOR DRIP EDGES WITH LANDSCAPE PLANS.

U:\4303-WHA Barra Road Development-Biddeford,ME - CAD\DWG\4303-GRADING.dwg 7/17/2024 1:30 PM

Rev.	Date	Revision
3	2024.07.17	FINAL PLAN SUBMISSION TO CITY OF BIDDEFORD
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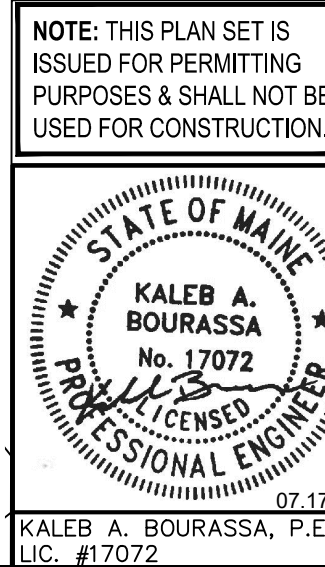
Design: KAB	Draft: CDD	Date: JUNE 2024
Checked: SRB	Scale: AS NOTED	Job No.: 4303
File Name: 4303-GRADING.dwg		
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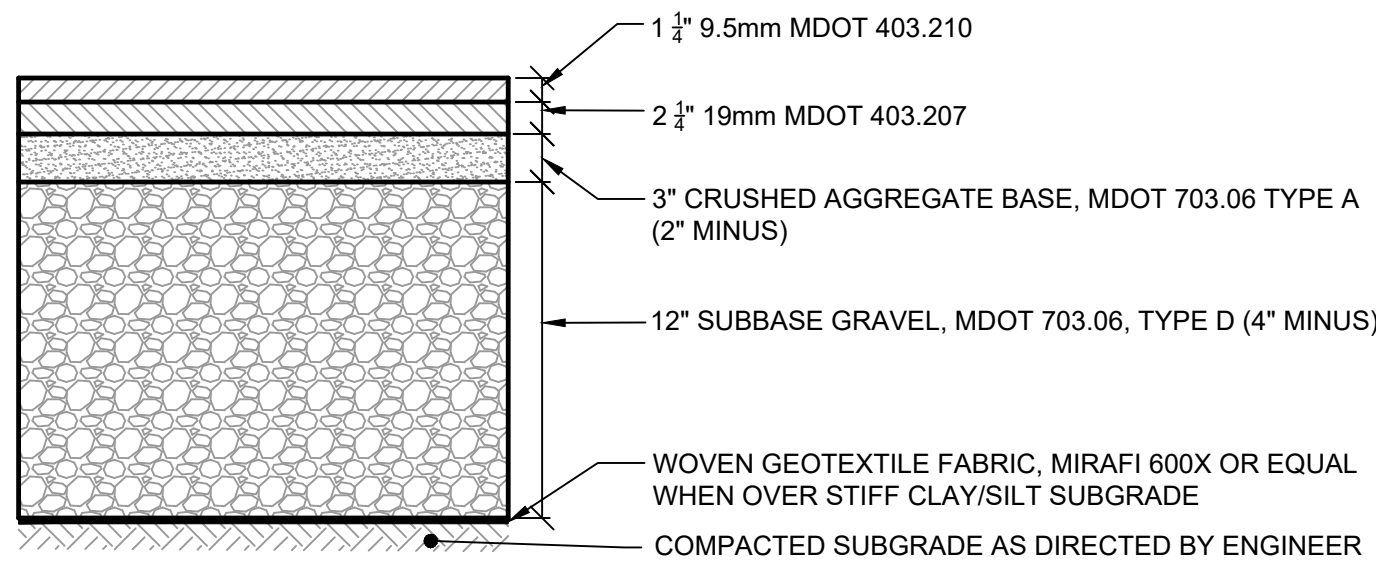
Gorriil Palmer, an LJB Engineering Company
GorriilPalmer.com
(207) 772-2515
300 Southborough Drive - Suite 200
South Portland, ME 04106

Drawing Name:	GRADING, DRAINAGE & EROSION CONTROL PLAN
Project:	PROPOSED RESIDENTIAL DEVELOPMENT 37 BARRA ROAD, BIDDEFORD, MAINE
Client:	WESTBROOK DEVELOPMENT CORPORATION 30 LIZA HARMON DRIVE, WESTBROOK, ME 04092

Drawing No.	C-5.0
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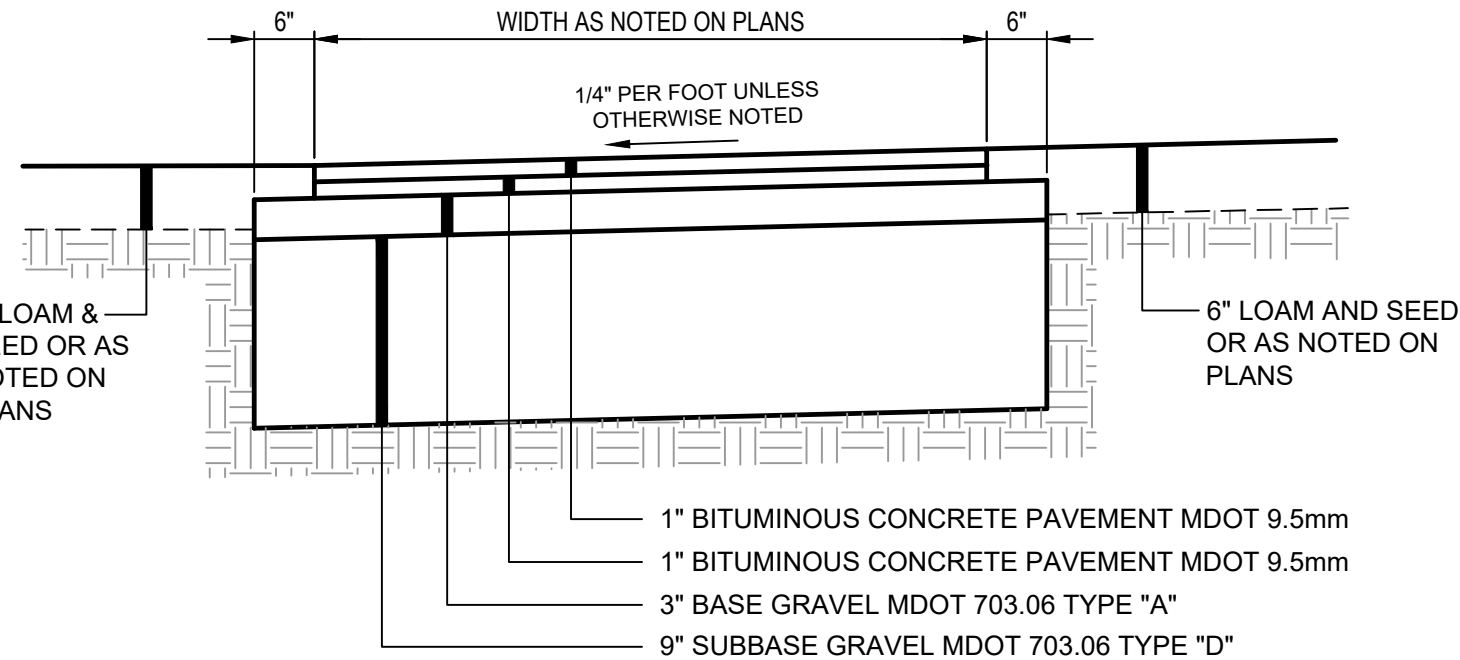
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- NOTES:
1. APPLY TACK COAT BETWEEN BINDER AND SURFACE COURSES.
 2. ALL MATERIALS SHALL CONFORM TO MDT SPECIFICATIONS, LATEST REVISION.

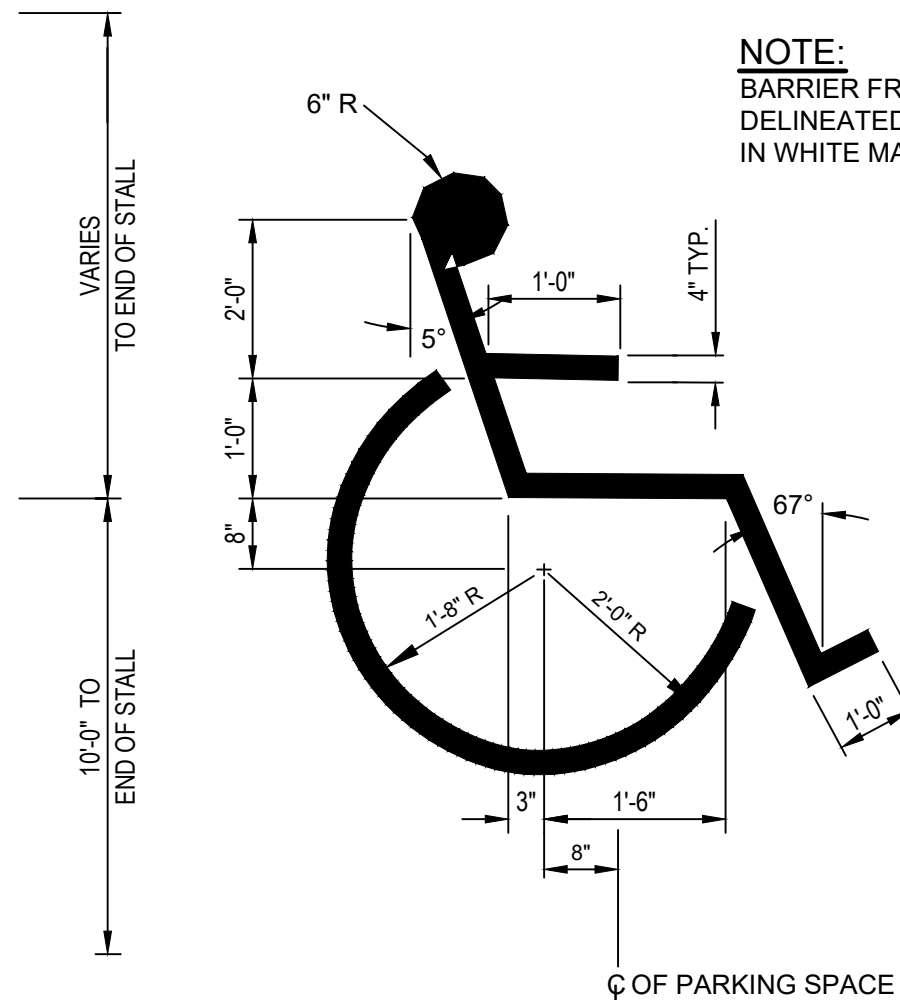
**STANDARD DUTY
BITUMINOUS CONCRETE PAVEMENT SECTION**

(A)
N.T.S.



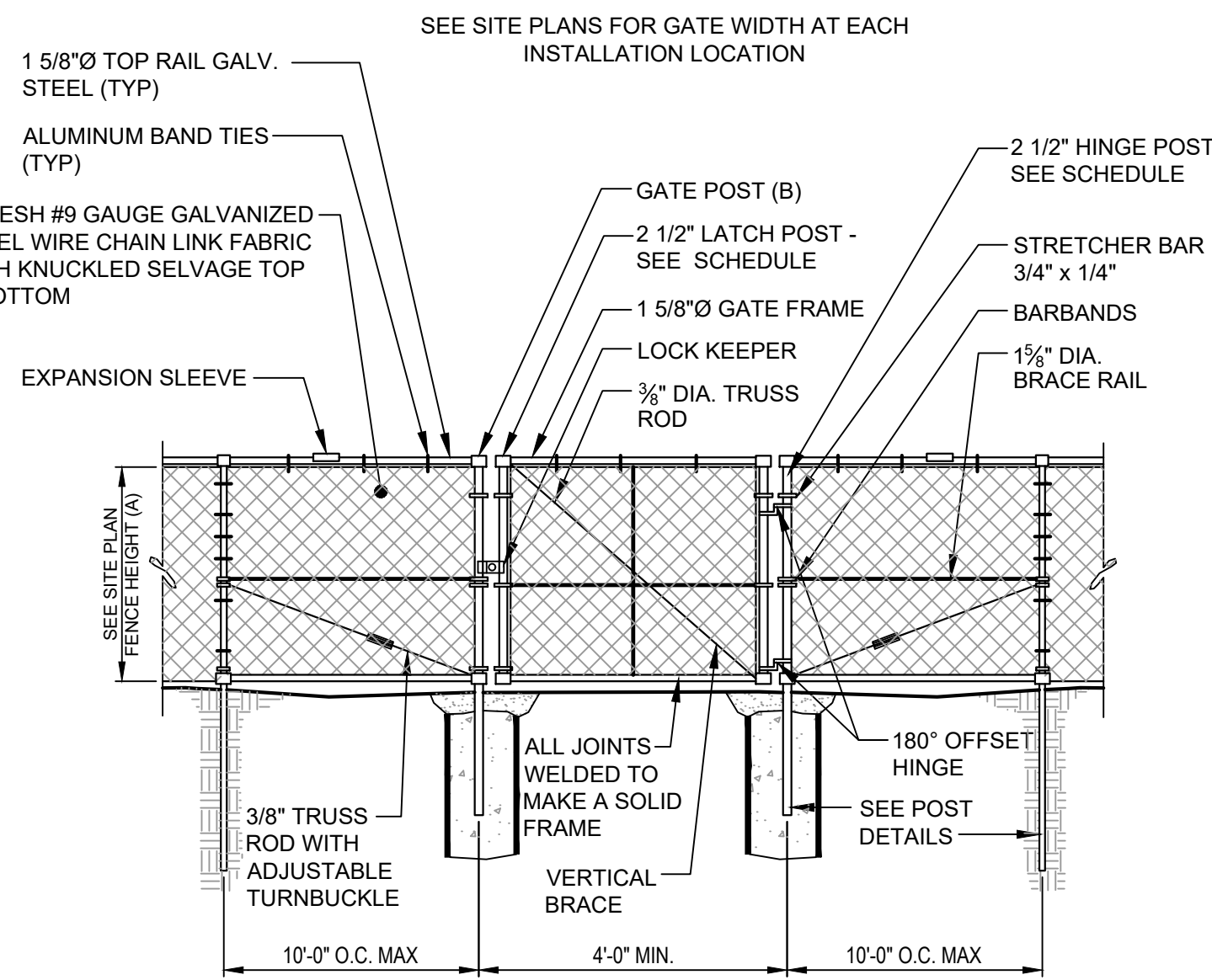
BITUMINOUS SIDEWALK DETAIL - NON-CURBED AREAS

(D)
N.T.S.

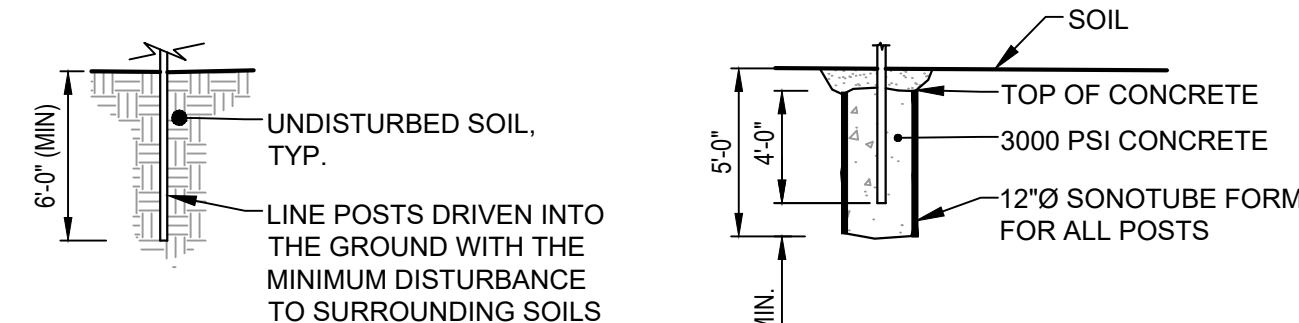


INTERNATIONAL BARRIER FREE SYMBOL

(G)
N.T.S.



4' WIDE PEDESTRIAN SINGLE SWING GATE (WHERE SHOWN ON PLANS)

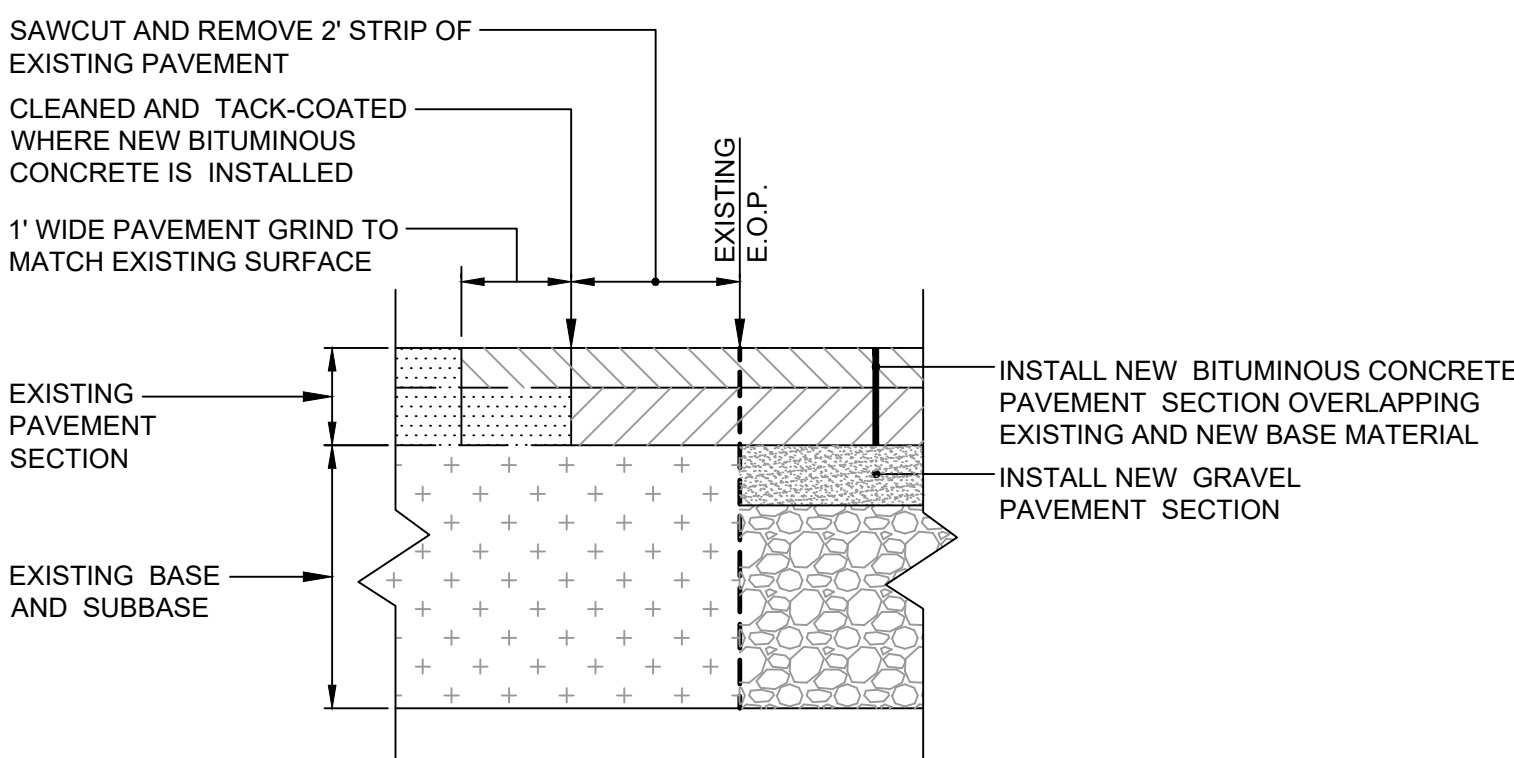


**INTERMEDIARY LINE
POST DETAIL**

**TERMINAL, CORNER &
GATE POST DETAIL**

CHAIN LINK FENCE INSTALLATION SCHEDULE			
FENCE HEIGHT (A)	TOP RAIL PIPE DIA. (B)	LINE POST PIPE DIA. (C)	CORNER, TERMINAL & GATE POST PIPE DIA. (D)
4'	1.66"	1.90"	2.375"
6'	1.66"	1.90"	2.375"
8'	1.66"	2.375"	2.875"
10'	1.66"	2.875"	2.875"

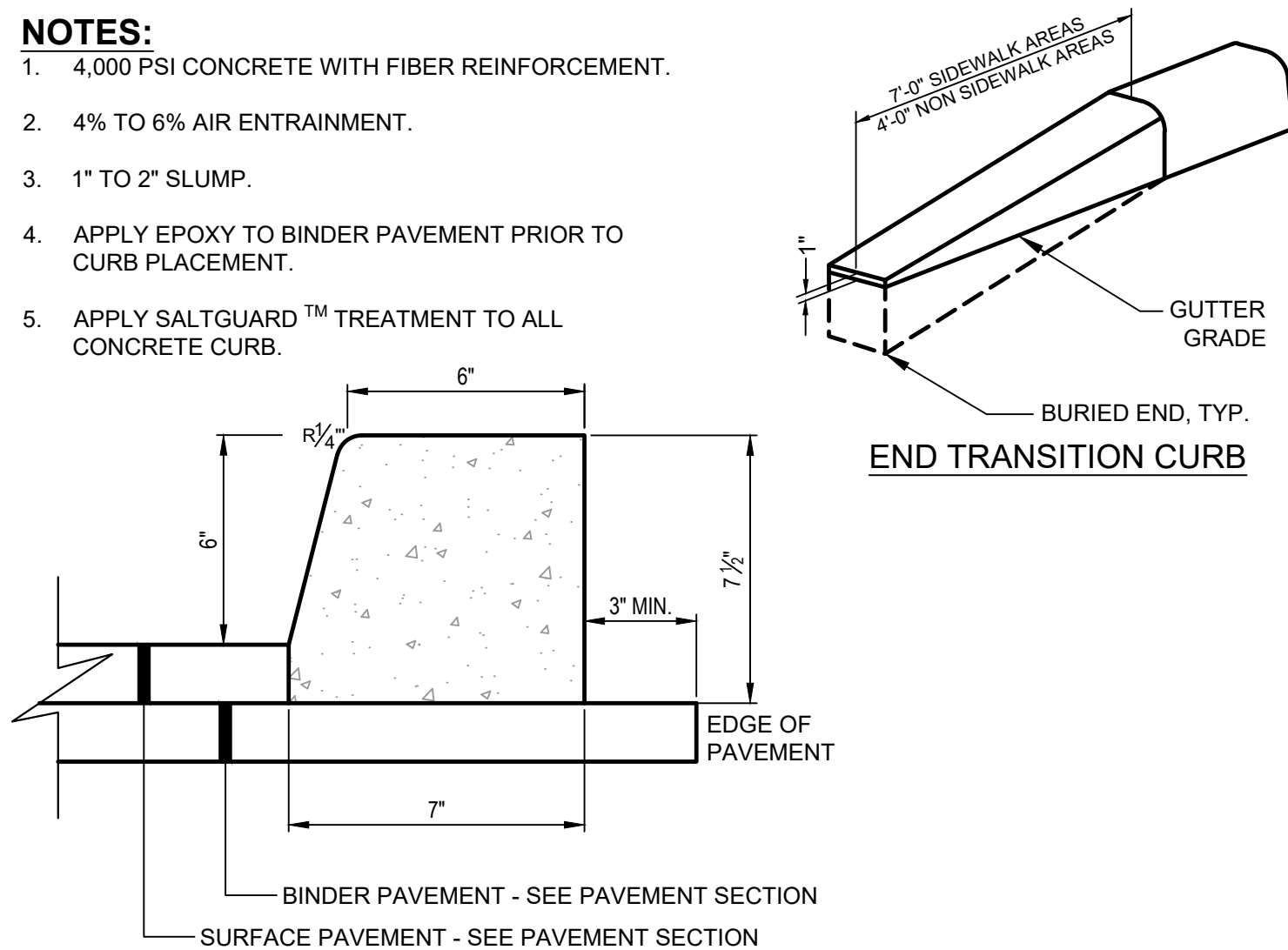
SINGLE SWINGING GATE INSTALLATION SCHEDULE	
FENCE HEIGHT (A)	GATE POST PIPE DIA. (B)
4'	2.875"
6'	2.875"
8'	4.000"
10'	4.000"



- NOTES:
1. APPLY TACK COAT BETWEEN BINDER AND SURFACE COURSES.
 2. ALL MATERIALS SHALL CONFORM TO MDT SPECIFICATIONS, LATEST REVISION.

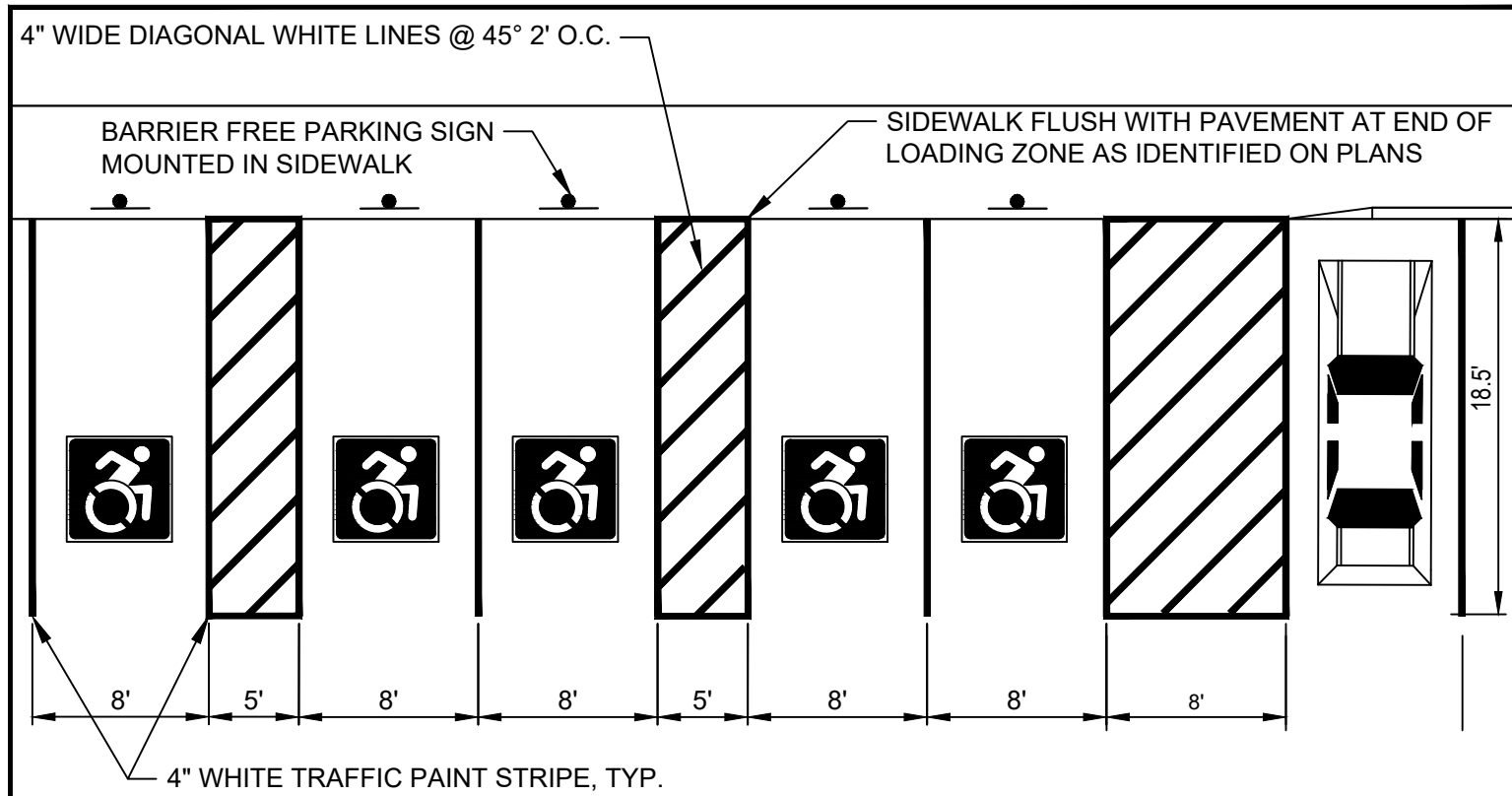
**TYPICAL PAVEMENT SECTION
NEW PAVEMENT ADJACENT TO EXISTING PAVEMENT**

(B)
N.T.S.



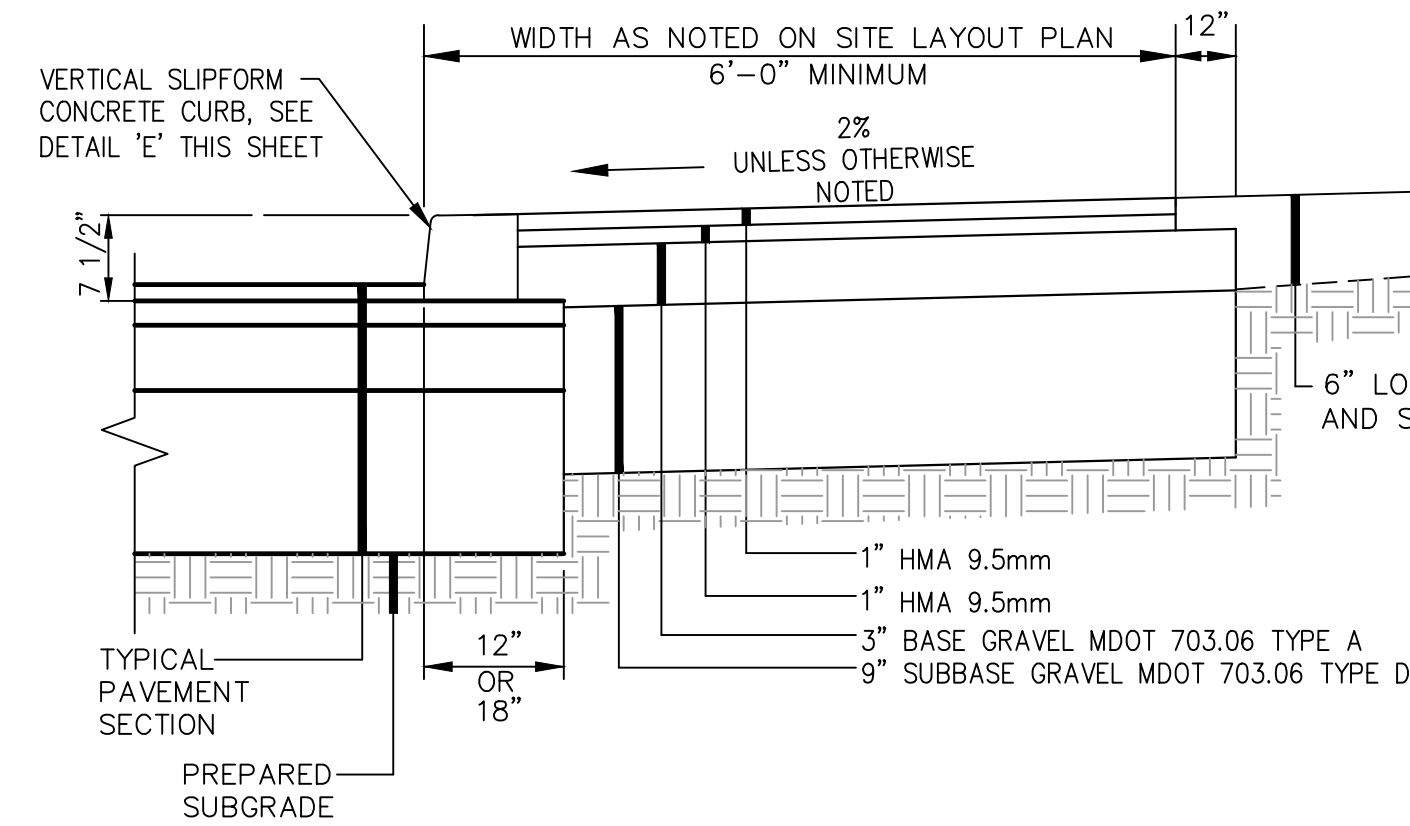
EXTRUDED VERTICAL SLIPFORM CONCRETE CURB

(E)
N.T.S.



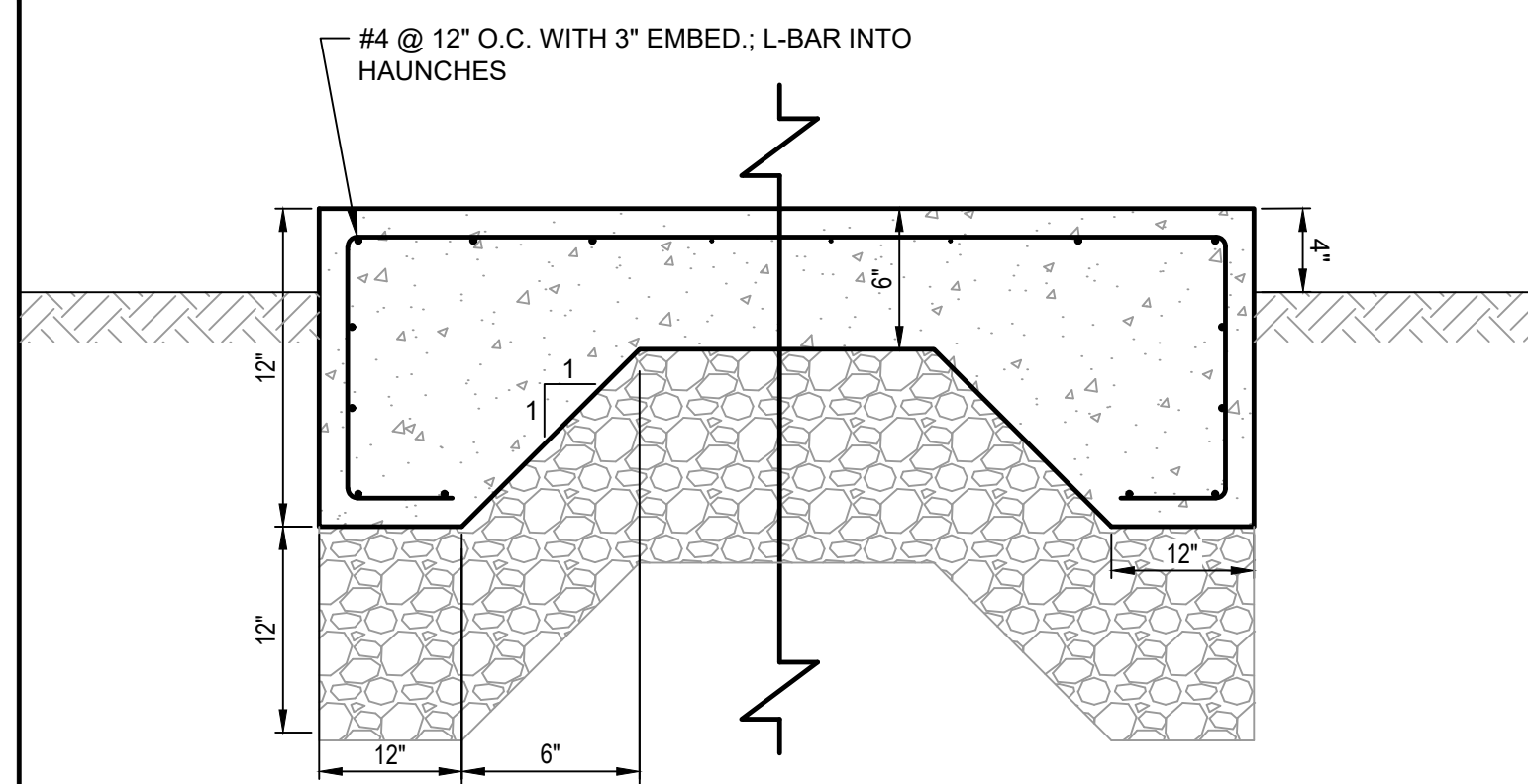
**TYPICAL BARRIER FREE PARKING STALL DIMENSIONS &
STANDARD PARKING STALL STRIPING**

(H)
N.T.S.



BITUMINOUS SIDEWALK DETAIL - CURBED AREAS

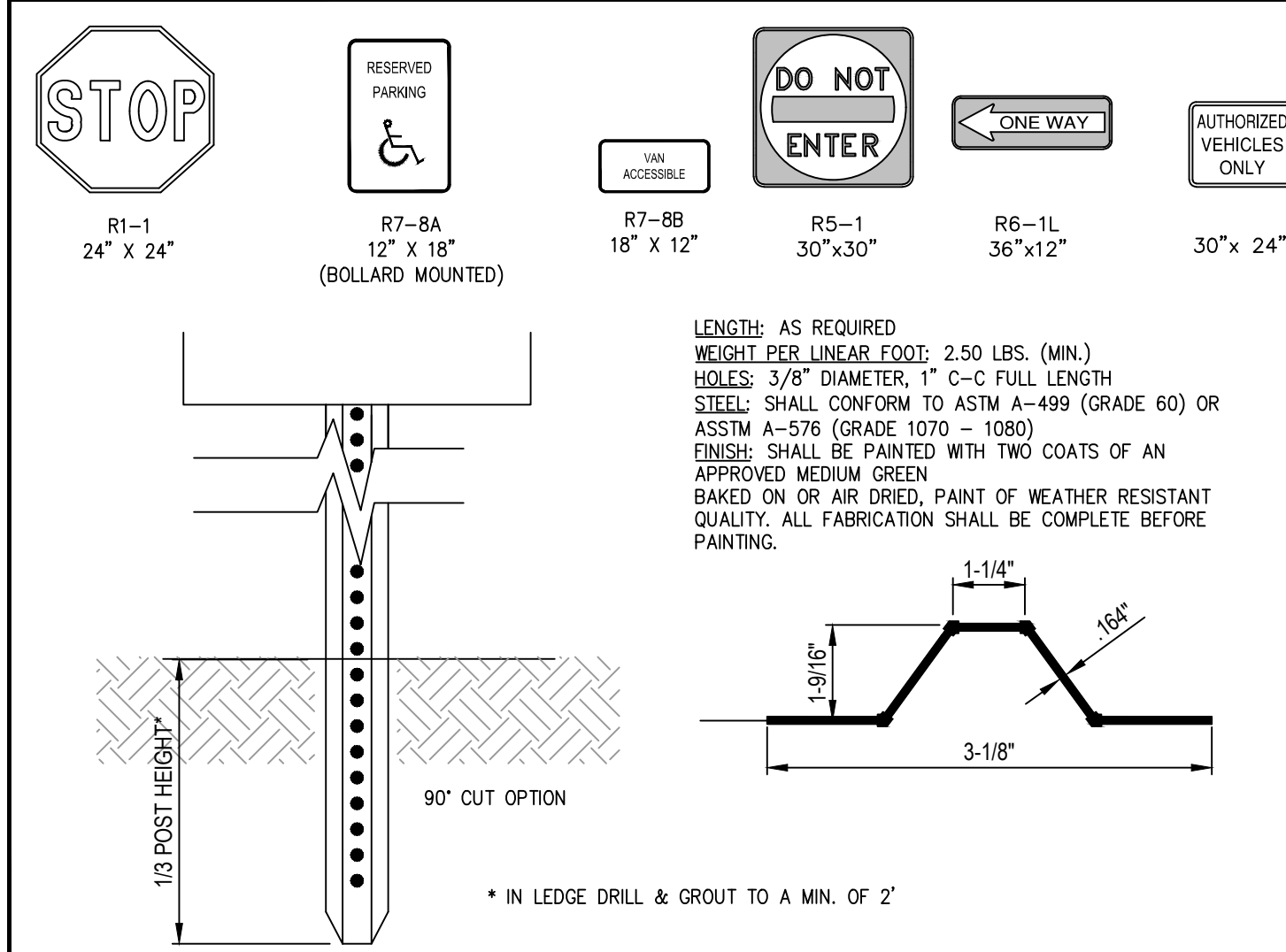
(C)
N.T.S.



- NOTES:
1. SEE SITE LAYOUT PLAN FOR PAD DIMENSIONS.
 2. 12" BASE GRAVEL SHALL BE MDT 703.06 STANDARDS FOR TYPE D GRAVEL.
 3. CONCRETE PAD SHALL HAVE COMPRESSIVE STRENGTH OF 4,500 PSI.
 4. PROVIDE BROOM FINISH AND SALTGUARD™ CHLORIDE INHIBITOR.

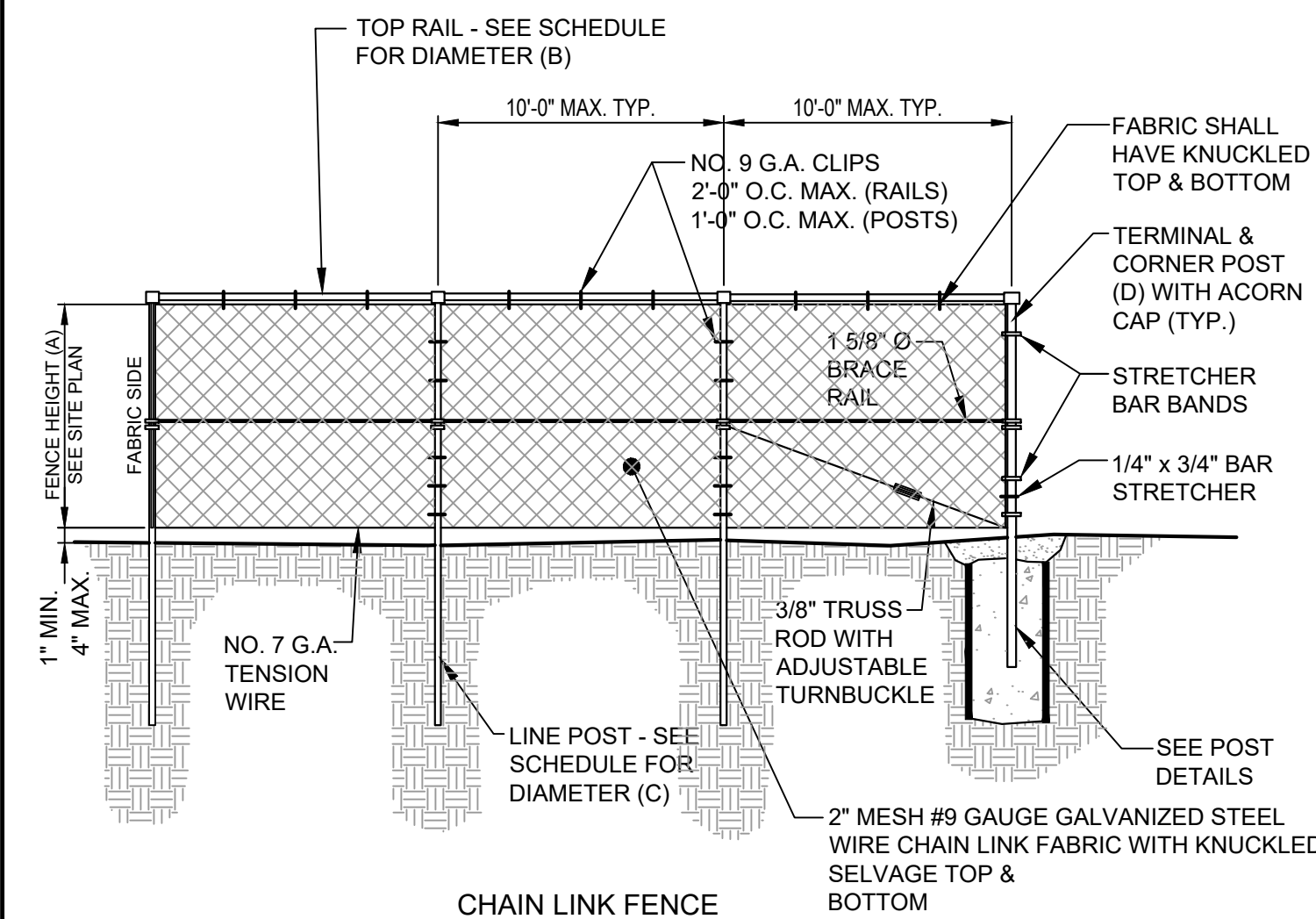
STAND-ALONE CONCRETE PAD DETAIL

(F)
N.T.S.



SIGN LEGEND & SIGN POST

(I)
N.T.S.

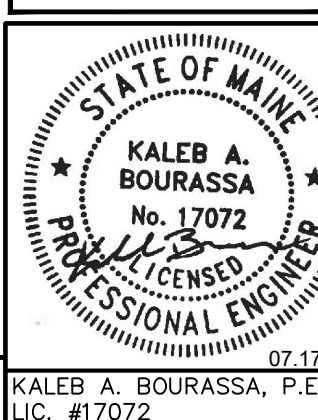


- NOTES:
1. DIMENSIONS FOR PIPE DIAMETERS ARE NOMINAL OUTSIDE DIAMETERS.
 2. REFER TO PLANS FOR LOCATION & HEIGHT OF FENCES TO BE INSTALLED.

GALVANIZED CHAIN LINK FENCE DETAILS

(J)
N.T.S.

NOTE: THIS PLAN SET IS
ISSUED FOR PERMITTING
PURPOSES & SHALL NOT BE
USED FOR CONSTRUCTION.



KALEB A. BOURASSA, P.E.
LIC. #17072

Design: KAB Draft: CDD Date: JUNE 2024
Checked: SRB Scale: AS NOTED Job No.: 4303
File Name: 4303-DETAILS.dwg

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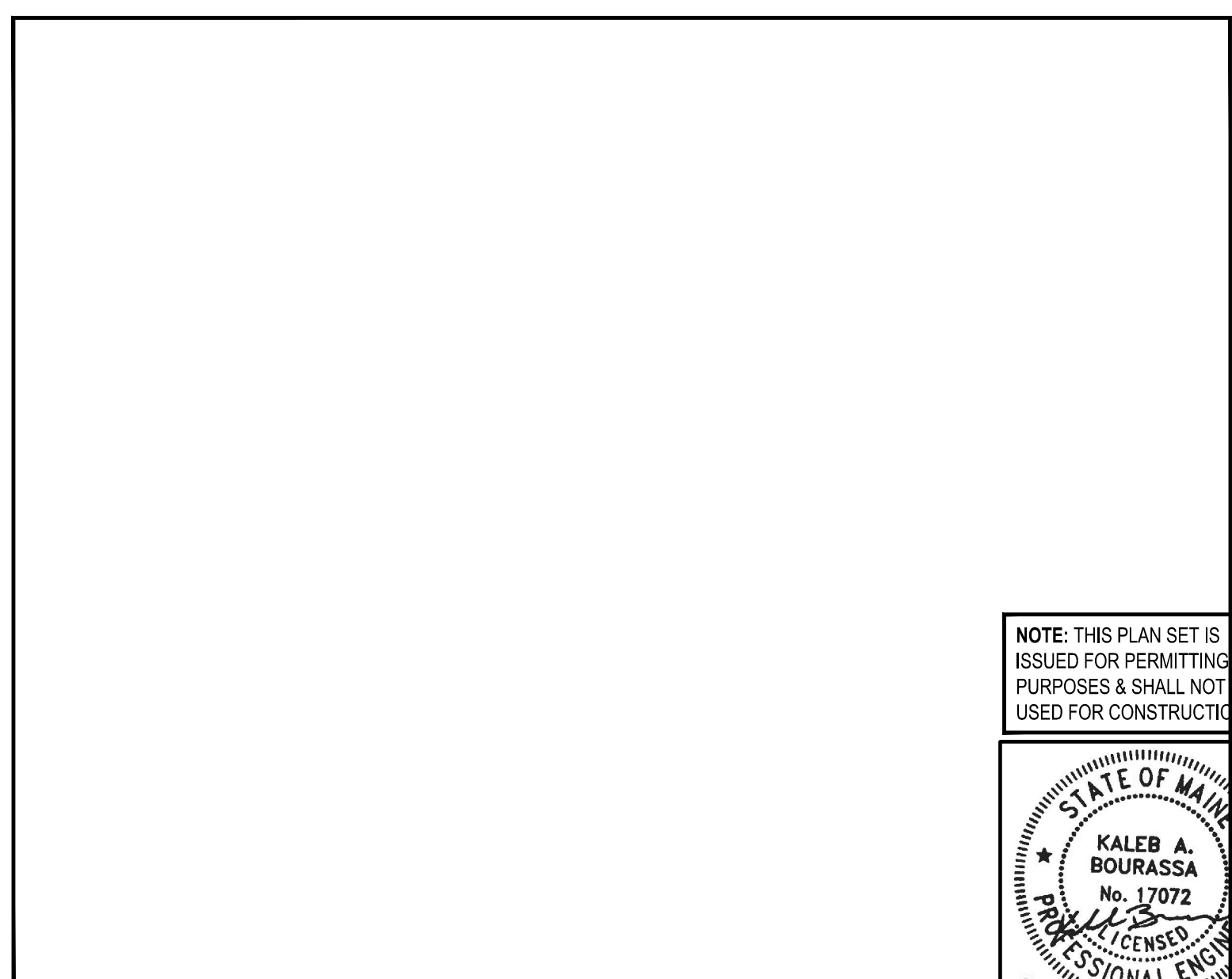
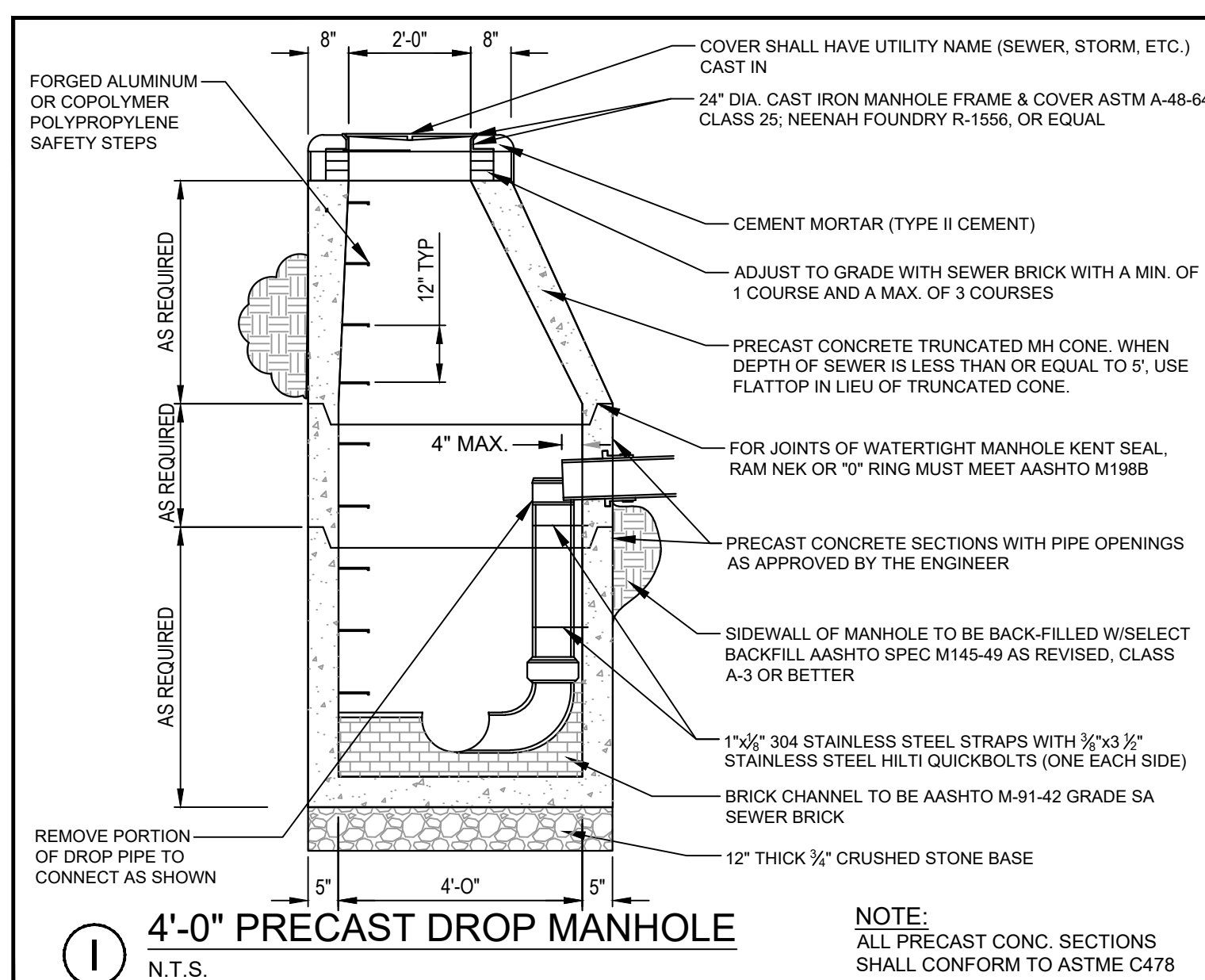
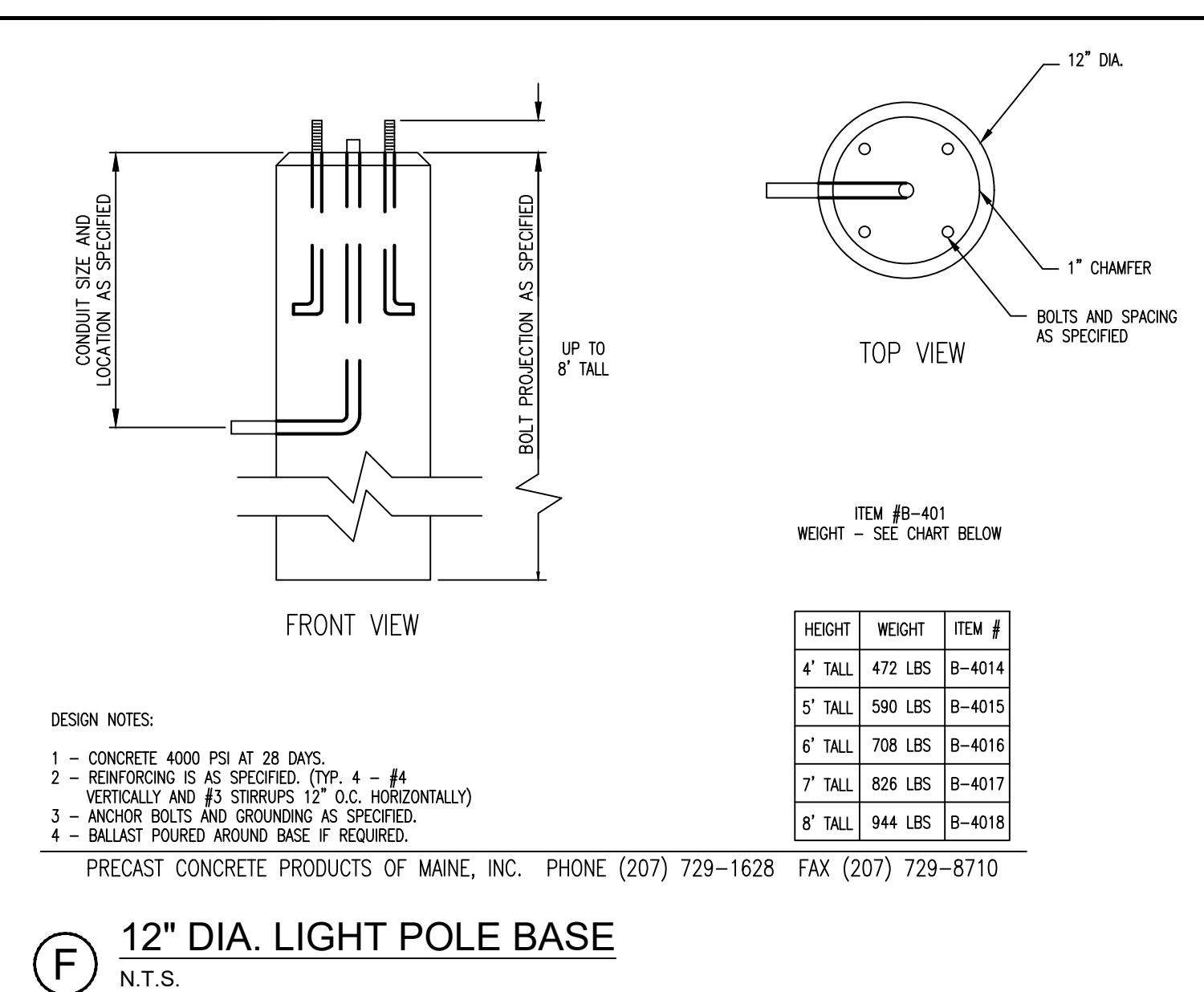
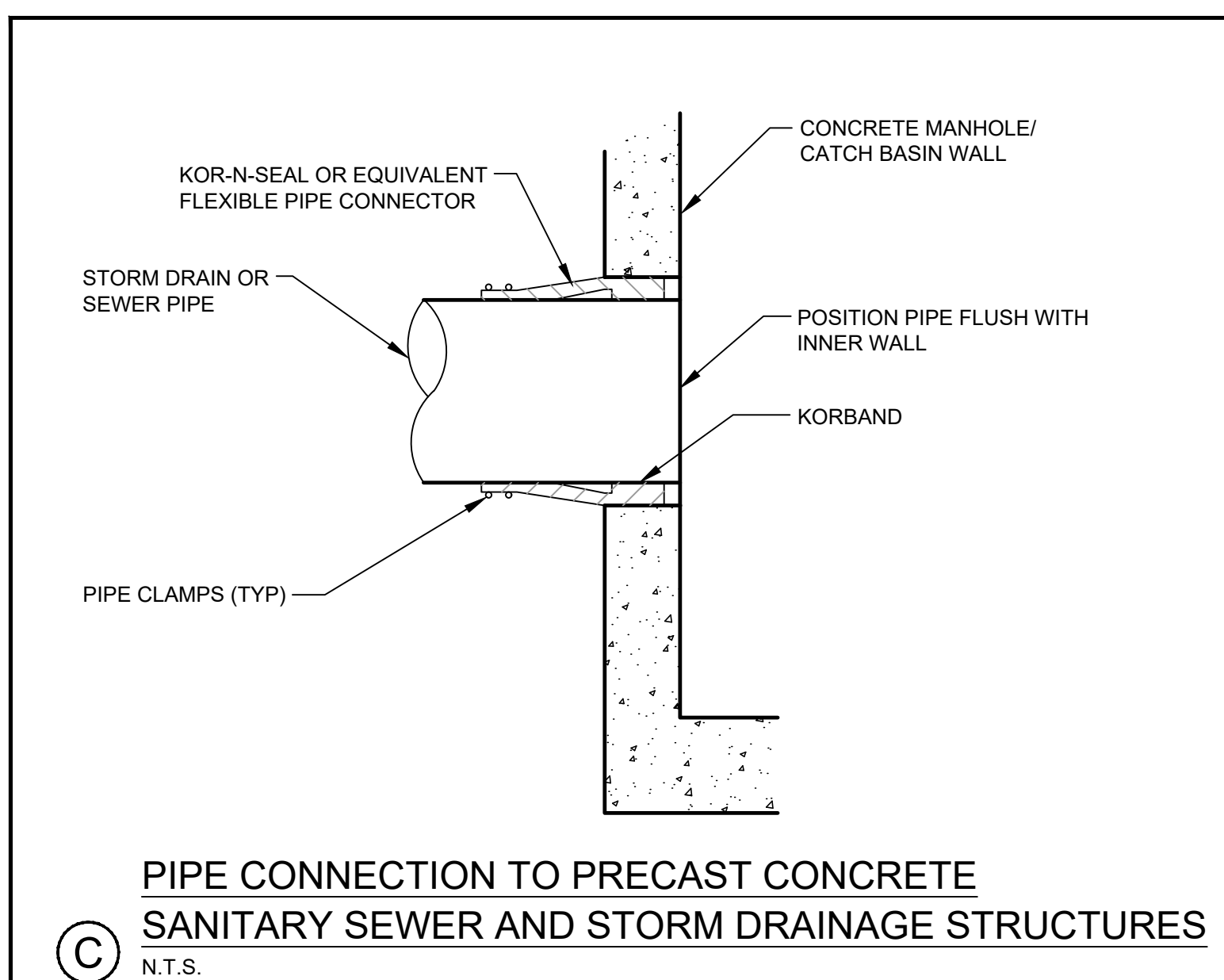
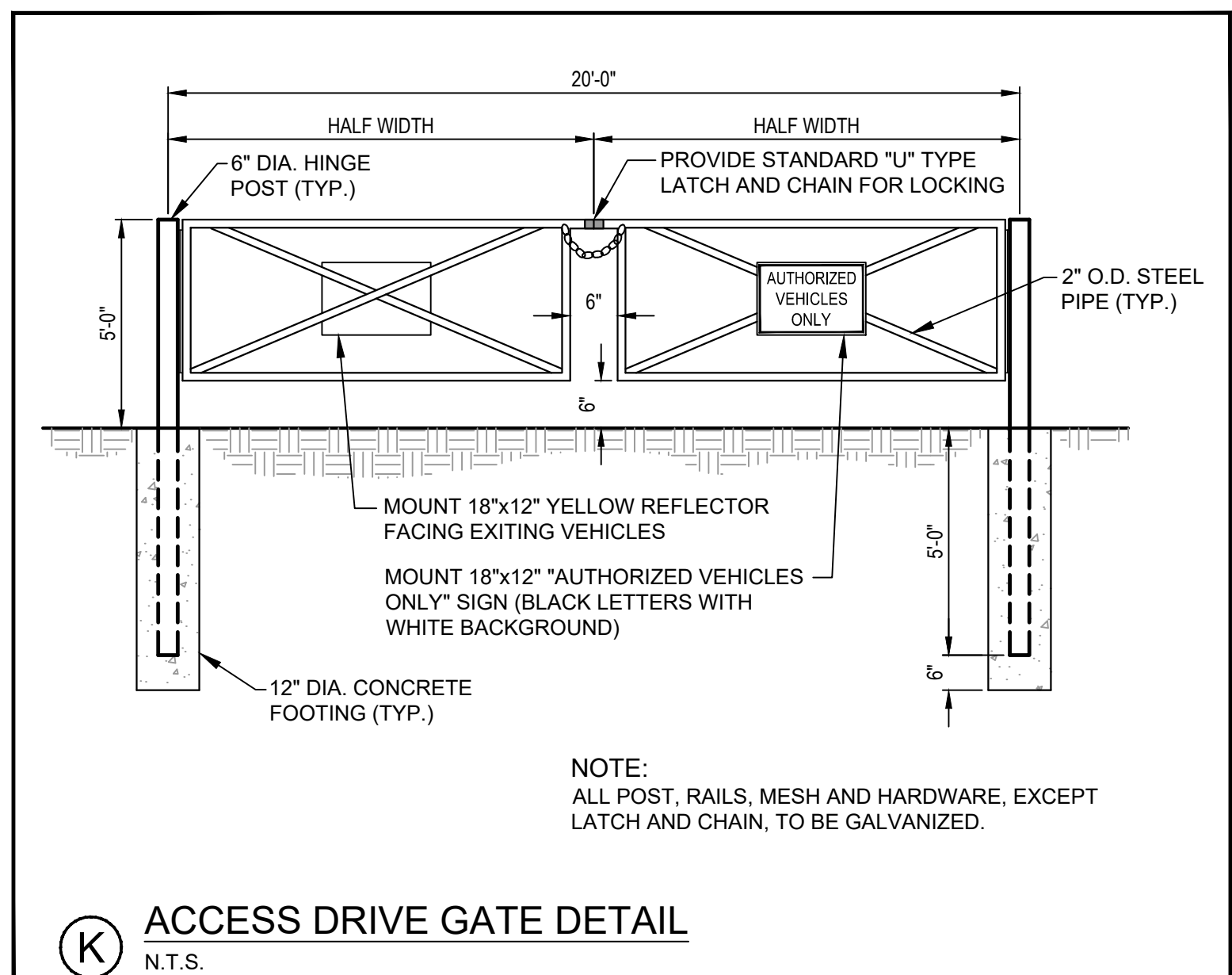
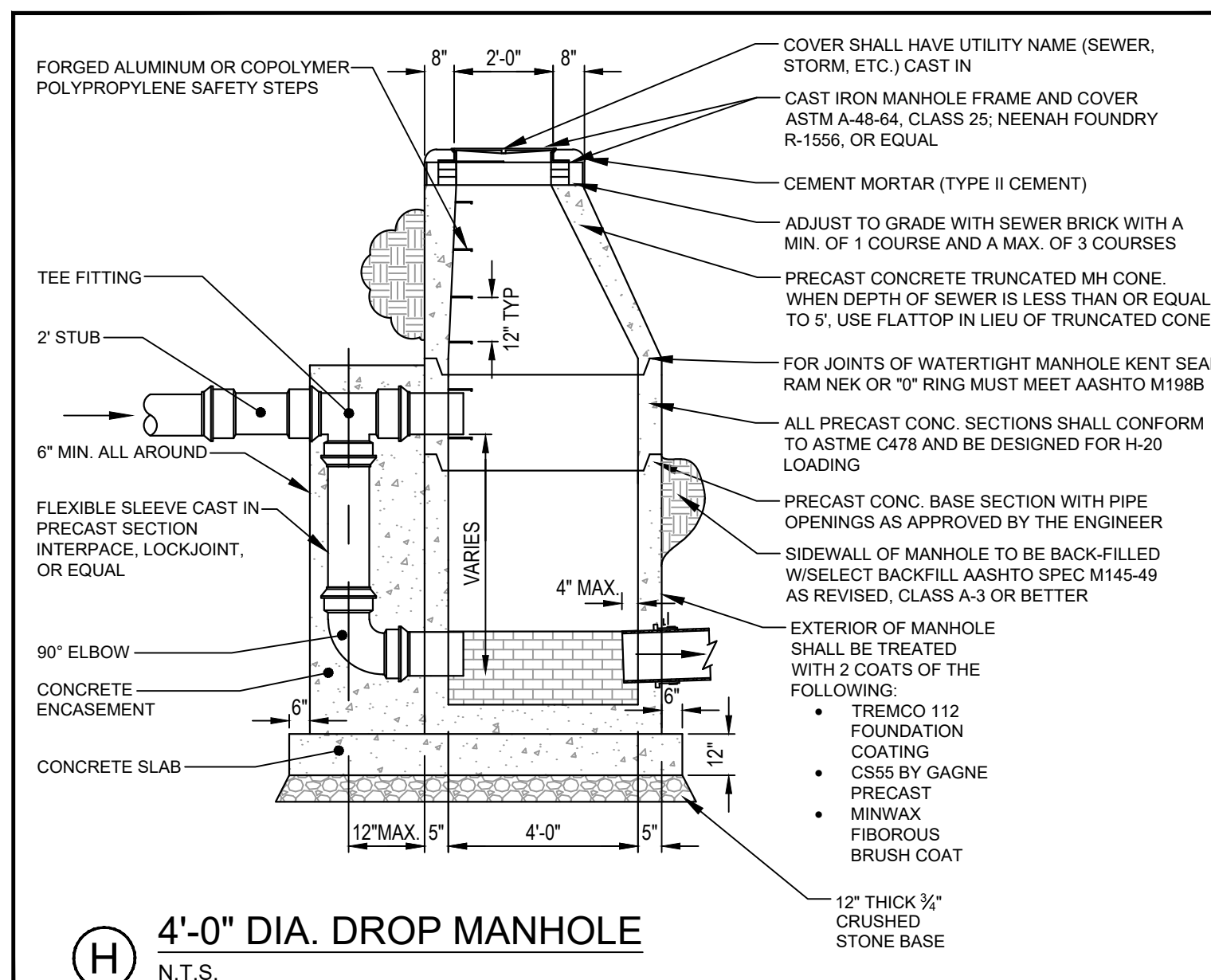
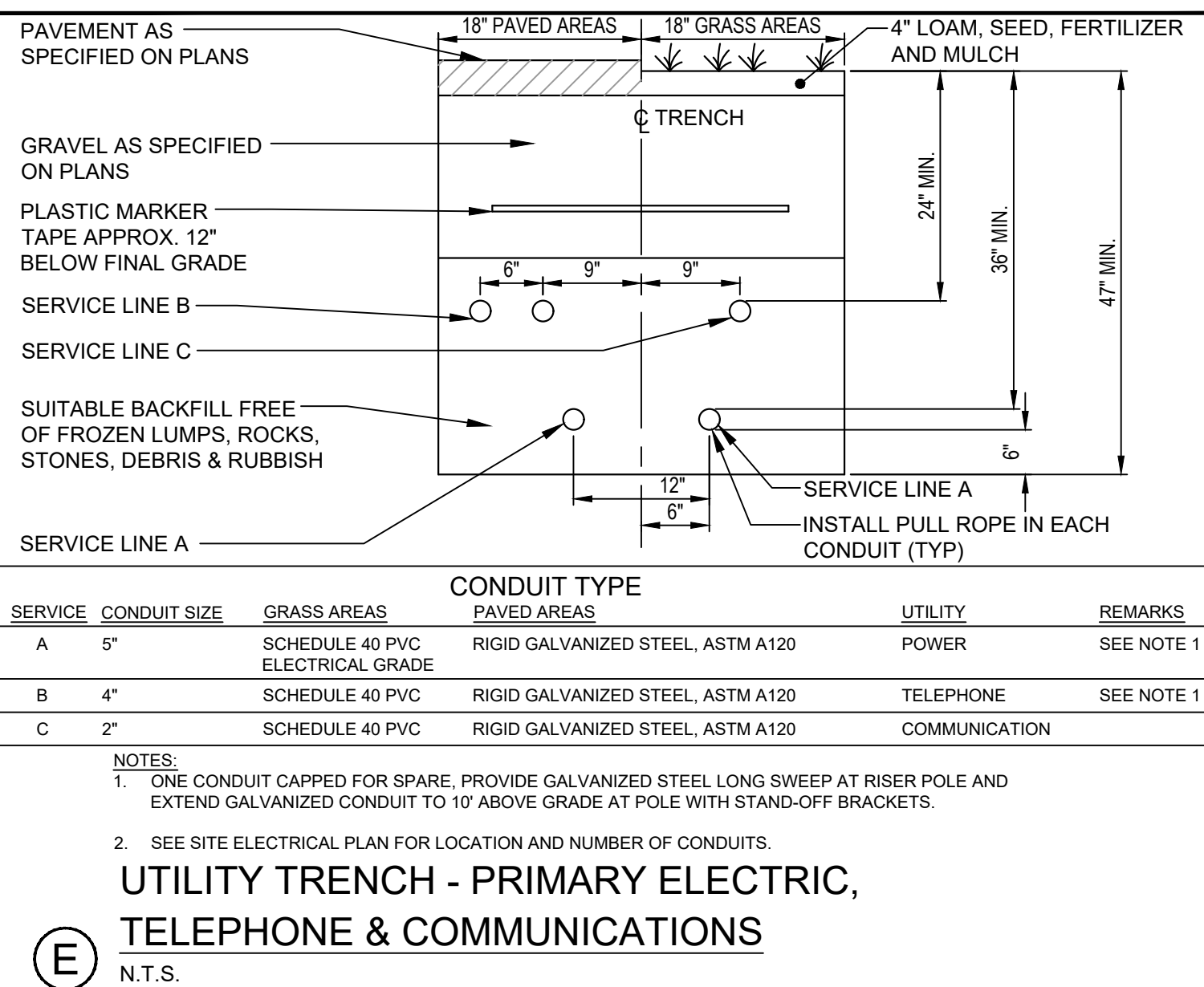
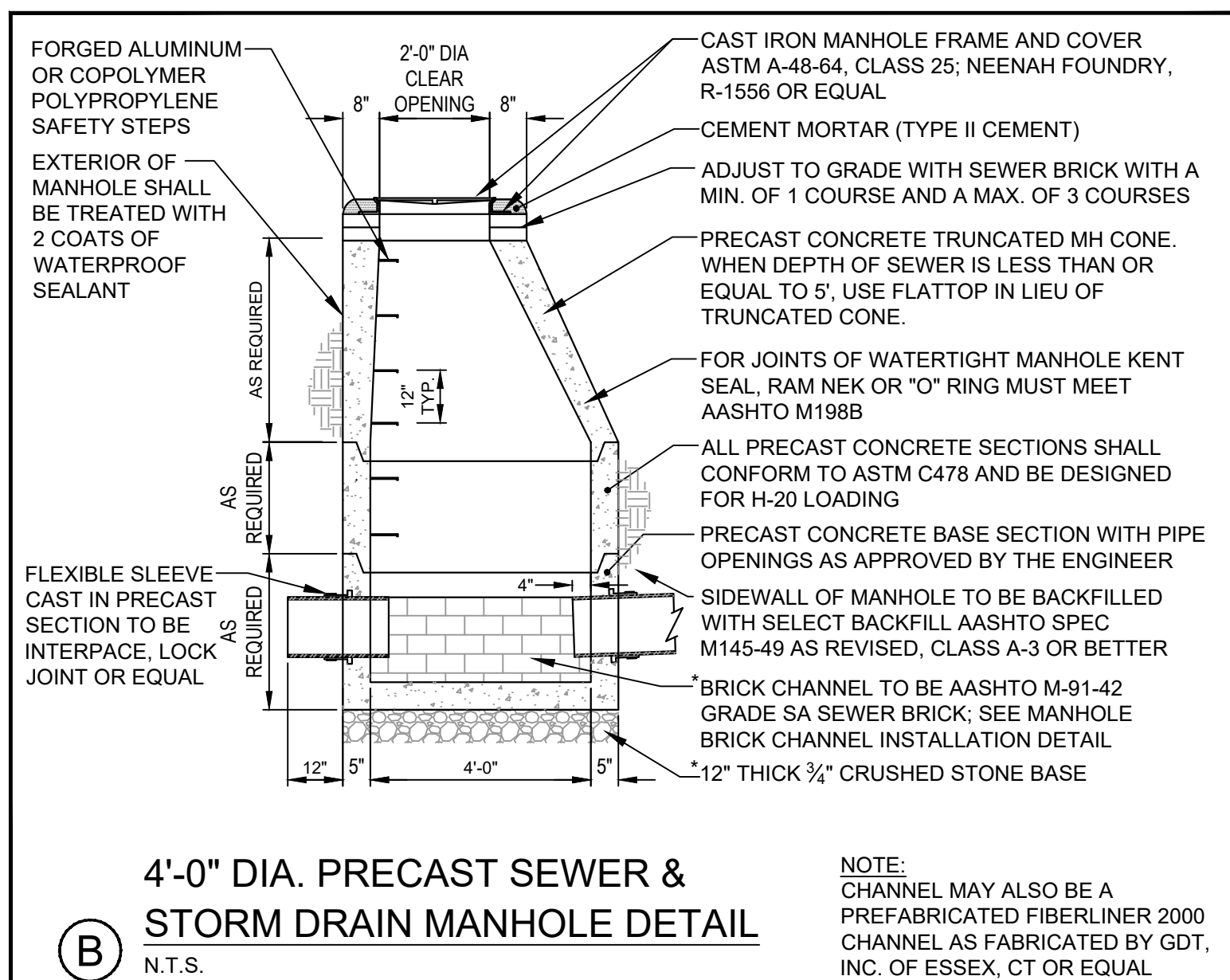
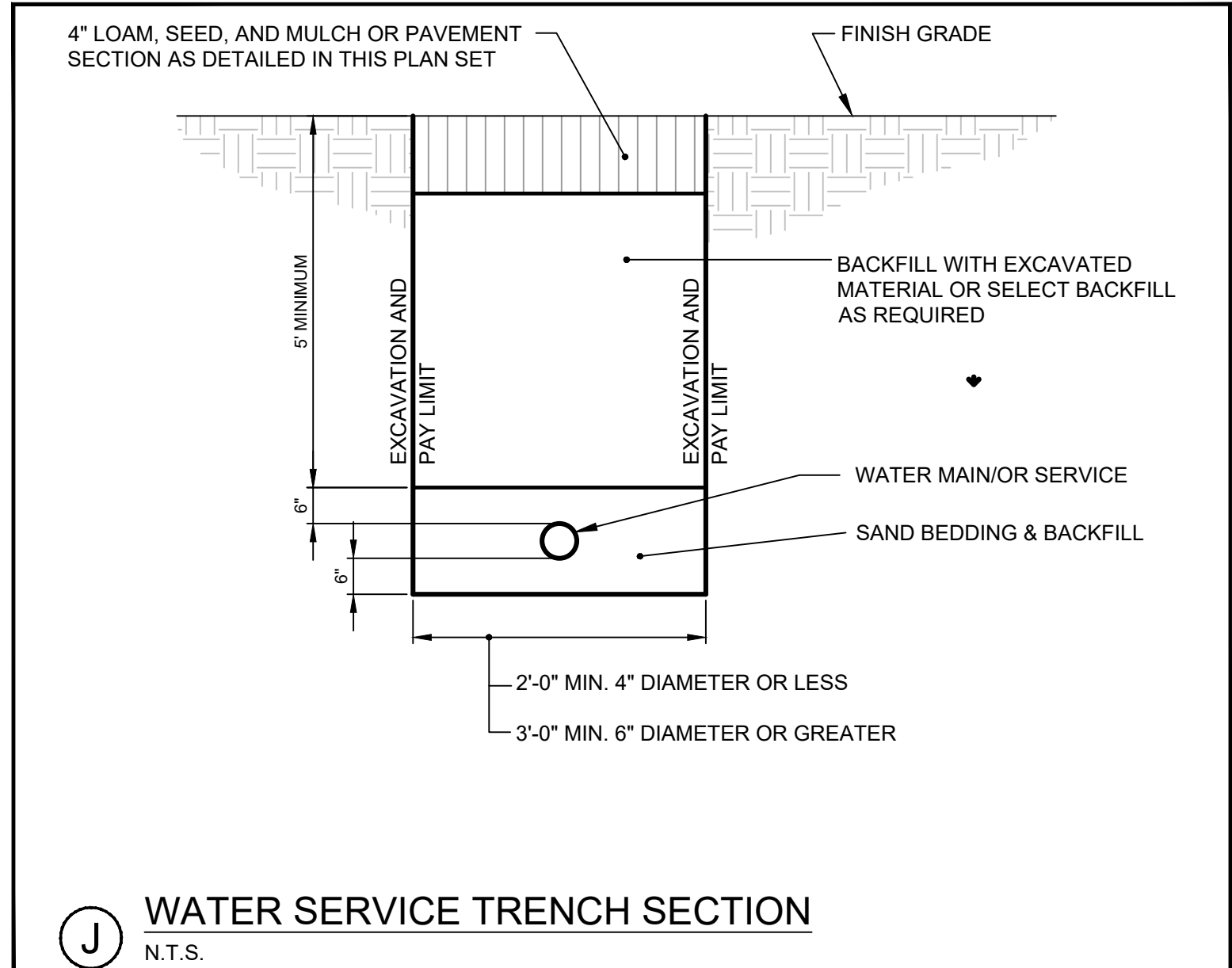
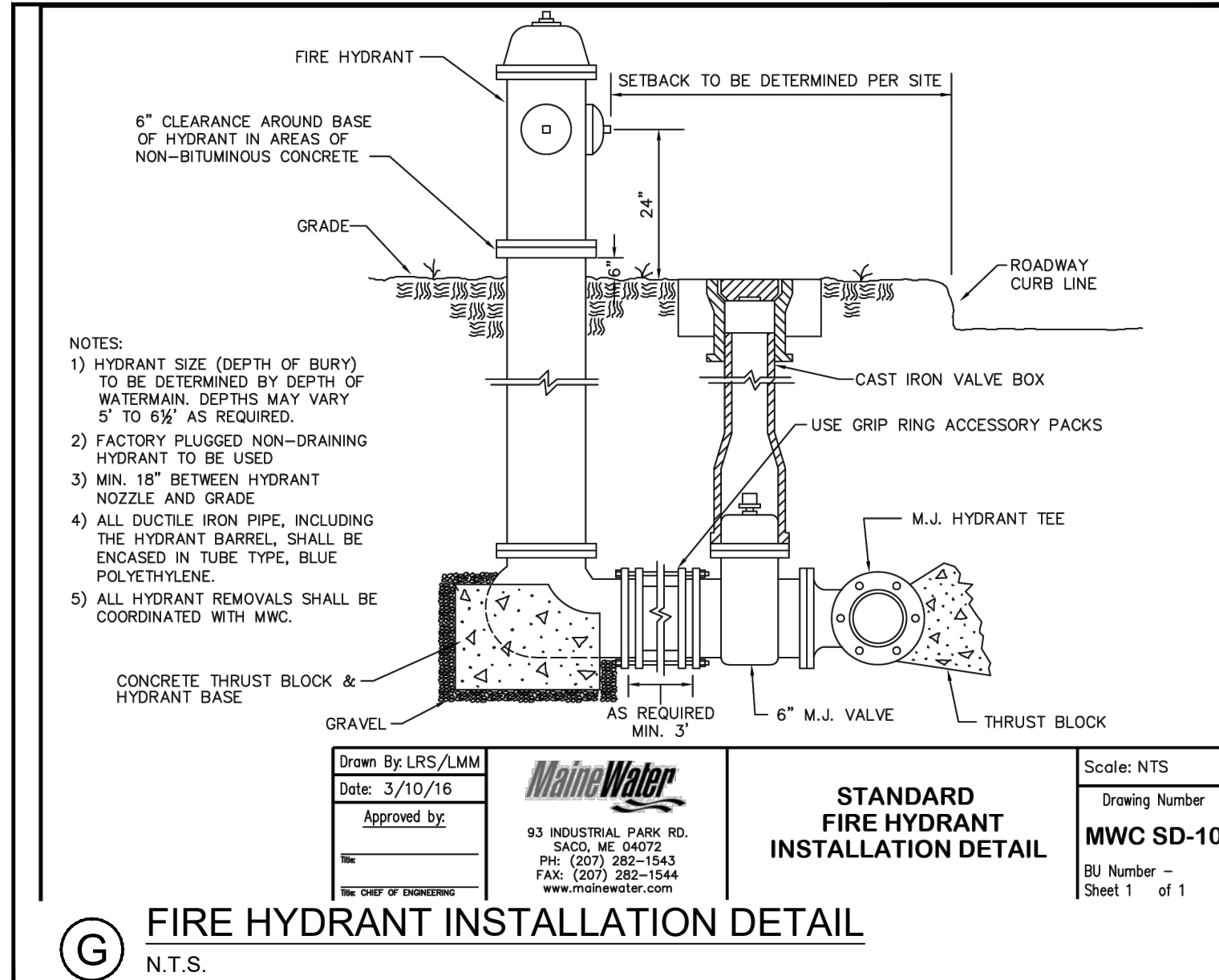
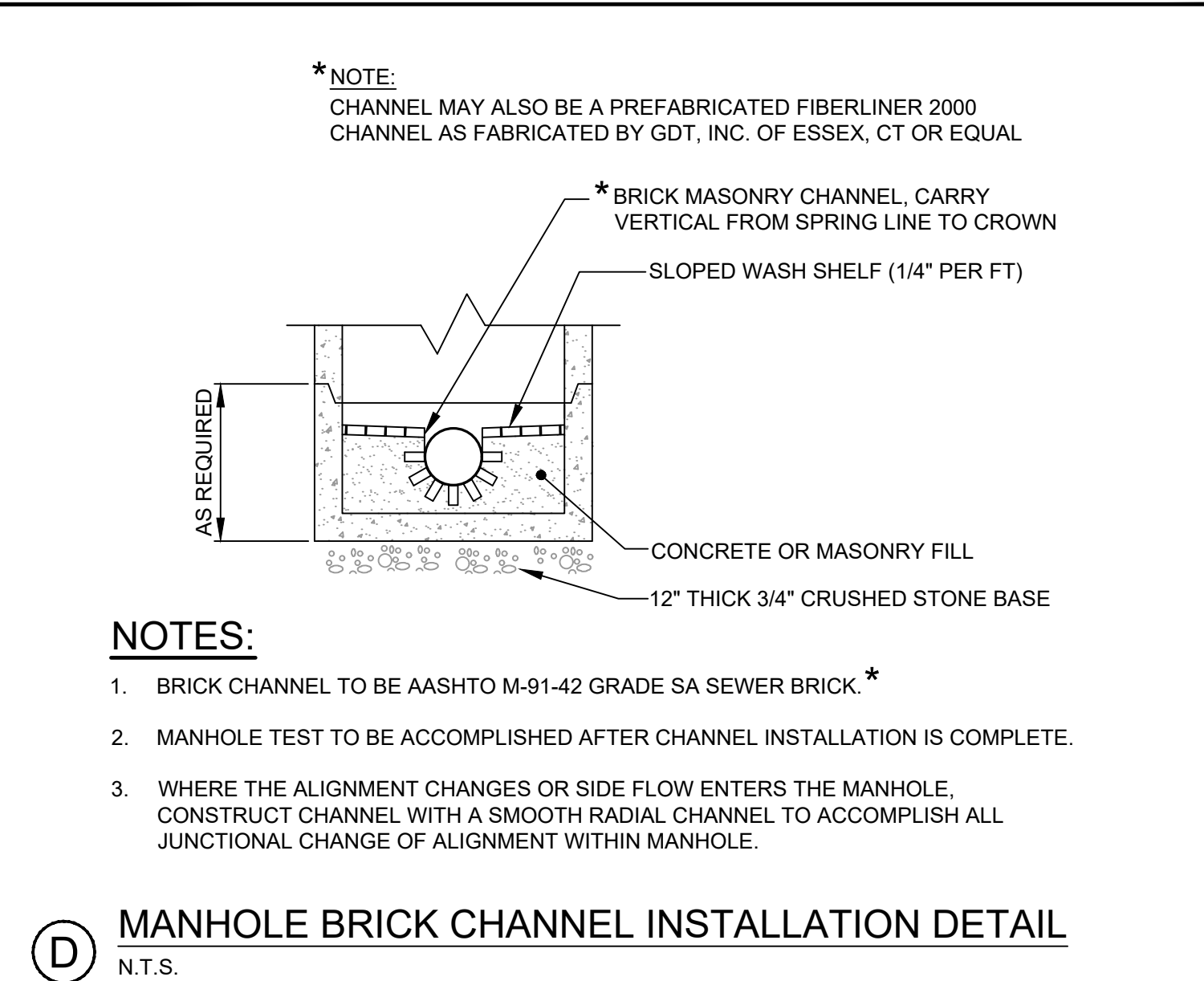
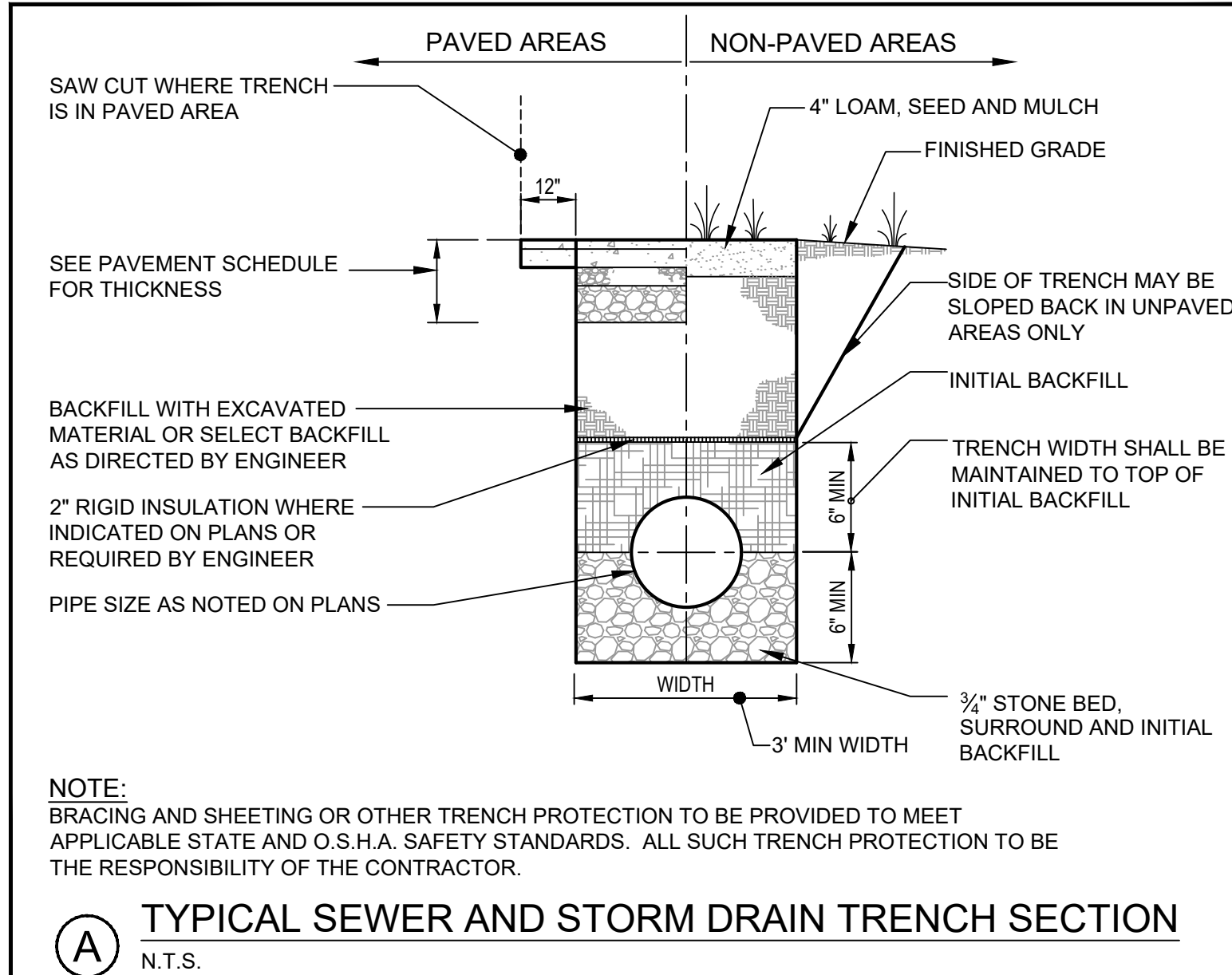


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Drawing Name: **SITE DETAILS**
Project: **PROPOSED RESIDENTIAL DEVELOPMENT
37 BARRA ROAD, BIDDEFORD, MAINE**
Client: **WESTBROOK DEVELOPMENT CORPORATION
30 LIZA HARMON DRIVE, WESTBROOK, ME 04092**

Drawing No.

C-6.0



Rev.	Date	Revision

3	2024.07.17	FINAL PLAN SUBMISSION TO CITY OF BIDDEFORD
2	2024.06.26	PRELIMINARY PLAN SUBMISSION TO CITY OF BIDDEFORD
1	2024.06.18	FOR CLIENT REVIEW
Rev.	Date	Revision

Design: KAB	Draft: CDD	Date: JUNE 2024
Checked: SRB	Scale: AS NOTED	Job No.: 4303
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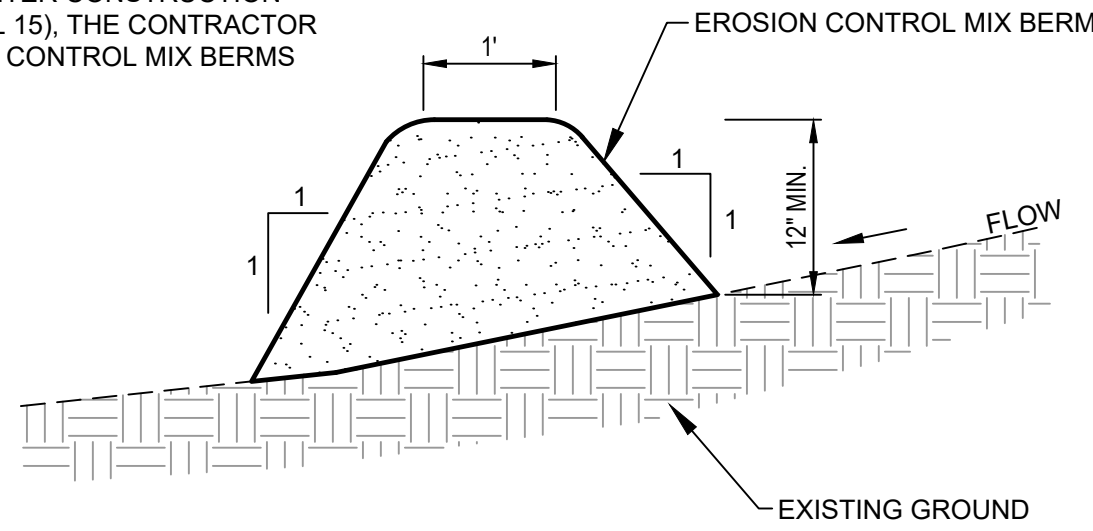
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Project:	PROPOSED RESIDENTIAL DEVELOPMENT 37 BARRA ROAD, BIDDEFORD, MAINE
Client:	WESTBROOK DEVELOPMENT CORPORATION 30 LIZA HARMON DRIVE, WESTBROOK, ME 04092

Drawing No.

C-6.1

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NOTE:
DURING PERIODS OF WINTER CONSTRUCTION (NOV. 15 THROUGH APRIL 15), THE CONTRACTOR SHALL INSTALL EROSION CONTROL MIX BERMS IN LIEU OF SILT FENCE.

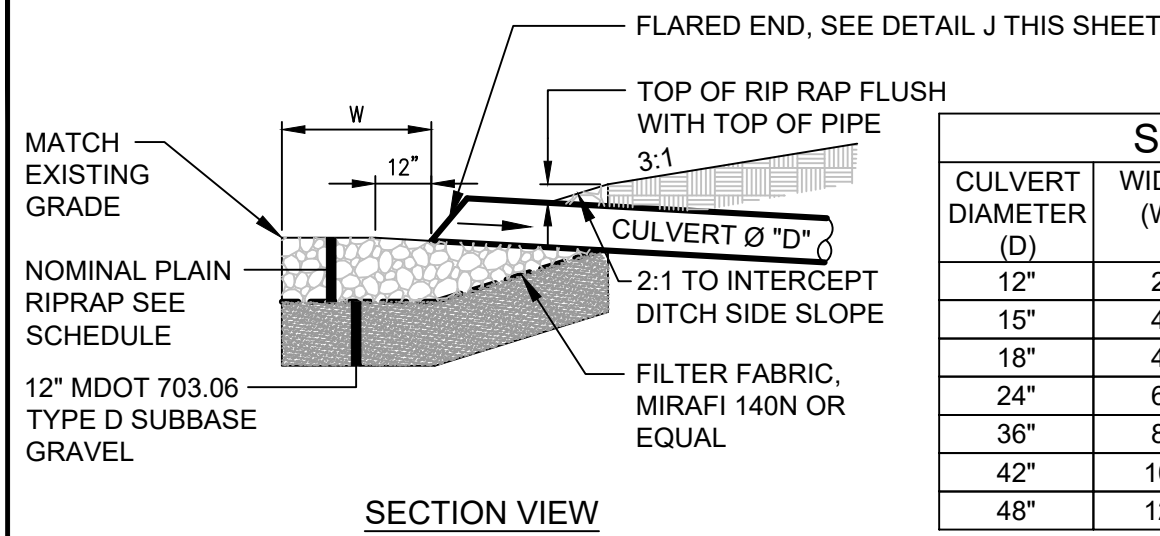


EROSION CONTROL MIX:

EROSION CONTROL MIX SHALL CONTAIN A WELL-GRADED MIXTURE OF PARTICLE SIZES & MAY CONTAIN ROCKS LESS THAN 4" IN DIAMETER. EROSION CONTROL MIX MUST BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH. THE MIX COMPOSITION SHALL MEET THE FOLLOWING STANDARDS:

- THE ORGANIC MATTER CONTENT SHALL BE BETWEEN 80 AND 100%, DRY WEIGHT BASIS.
- PARTICLE SIZE BY WEIGHT SHALL BE 100% PASSING A 6" SCREEN AND A MINIMUM OF 70%, MAXIMUM OF 85%, PASSING A 0.75" SCREEN.
- THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED.
- LARGE PORTIONS OF SILTS, CLAYS OR FINE SANDS ARE NOT ACCEPTABLE IN THE MIX.
- SOLUBLE SALTS CONTENT SHALL BE < 4.0 mmhos/cm.
- PH SHALL FALL BETWEEN 5.0 AND 8.0.

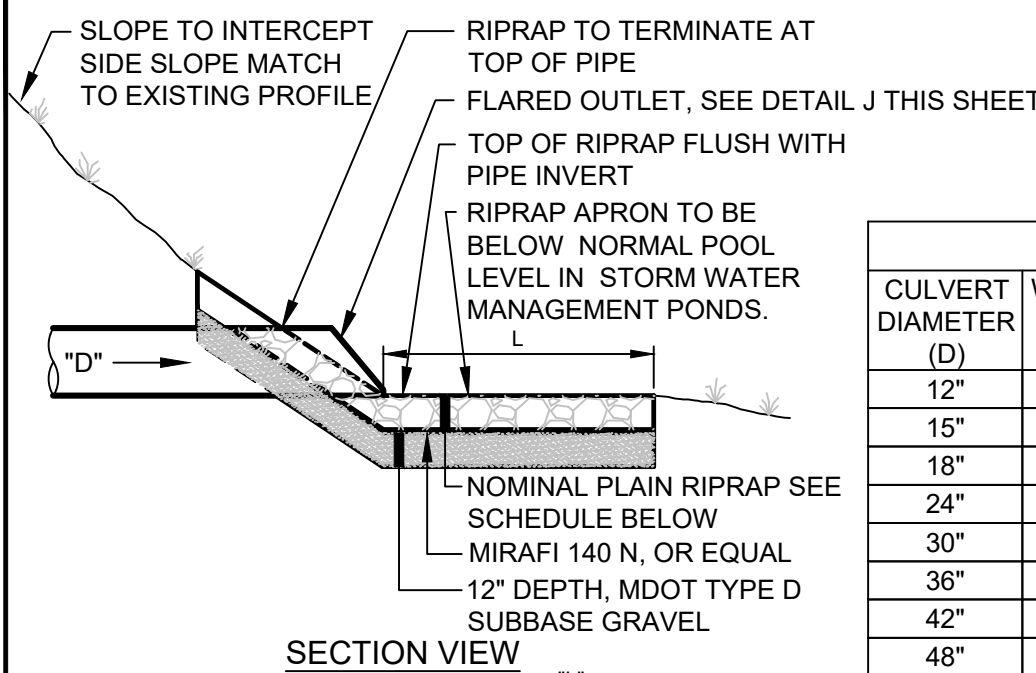
A EROSION CONTROL MIX BERM DETAIL
N.T.S.



SCHEDULE			
CULVERT DIAMETER (D)	WIDTH (W)	STONE D ₅₀	RIPRAP THICKNESS
12"	2'	6"	14"
15"	4'	6"	14"
18"	4'	6"	14"
24"	6'	6"	14"
36"	8'	12"	27"
42"	10'	12"	27"
48"	12'	12"	27"

NOTE:
RIPRAP GRADATION AND PLACEMENT - THE RIPRAP GRADATION SHALL BE A WELL-GRADED MIX FROM ABOUT 1.5 TIMES THE D SIZE TO ABOUT 25 PERCENT OF THE D SIZE. THE RIPRAP STONES SHALL BE CAREFULLY PLACED WORKING FROM THE TOE OF THE SLOPE UPWARD. THE STONES SHOULD BE LOWERED TO THE SLOPE AND NOT BE ALLOWED TO DROP MORE THAN 12 INCHES ONTO THE GEOTEXTILE. THE FINISHED SURFACE SHALL BE A RELATIVELY SMOOTH UNIFORMLY SLOPED SURFACE.

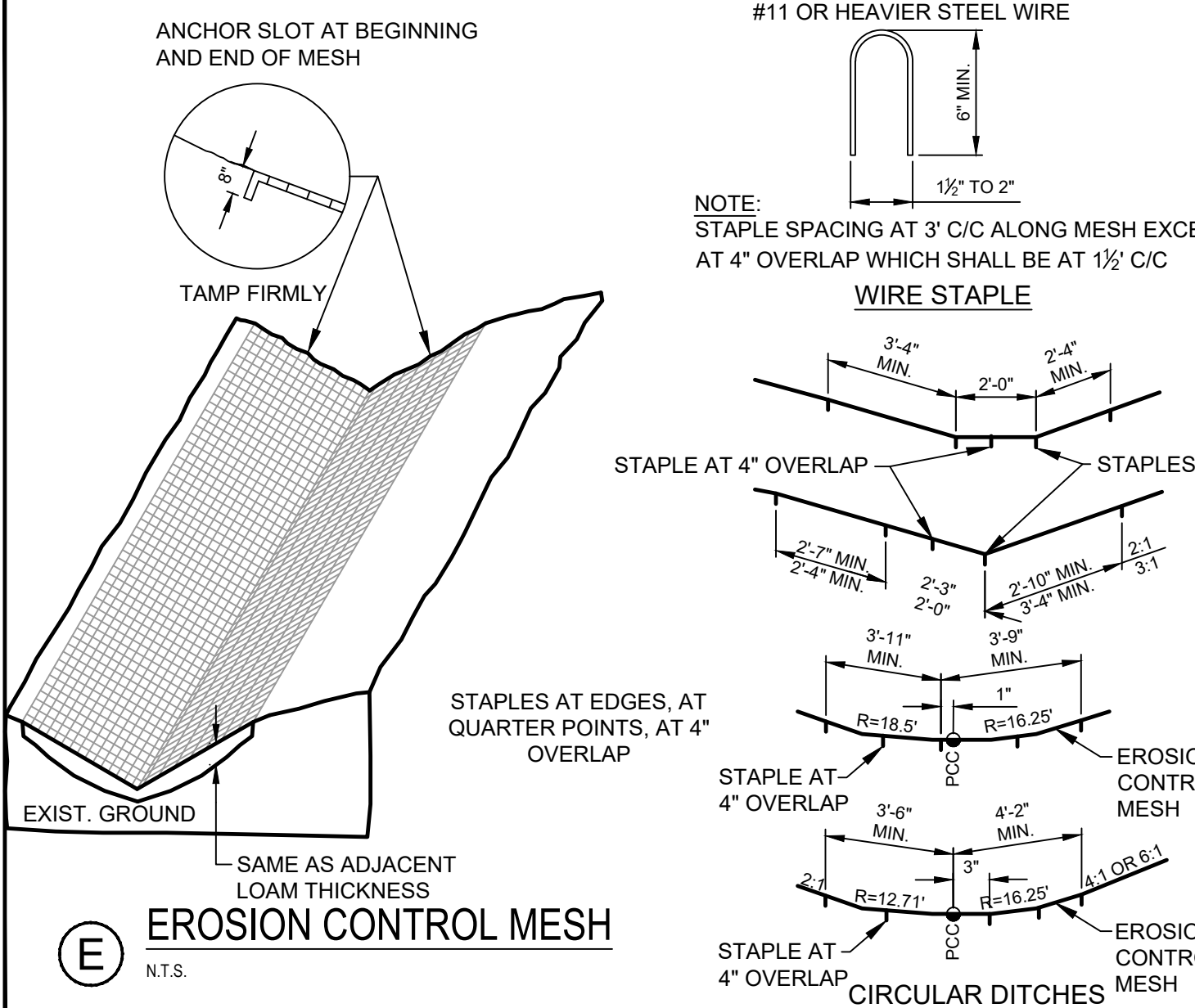
B PIPE/CULVERT INLET APRON
N.T.S.



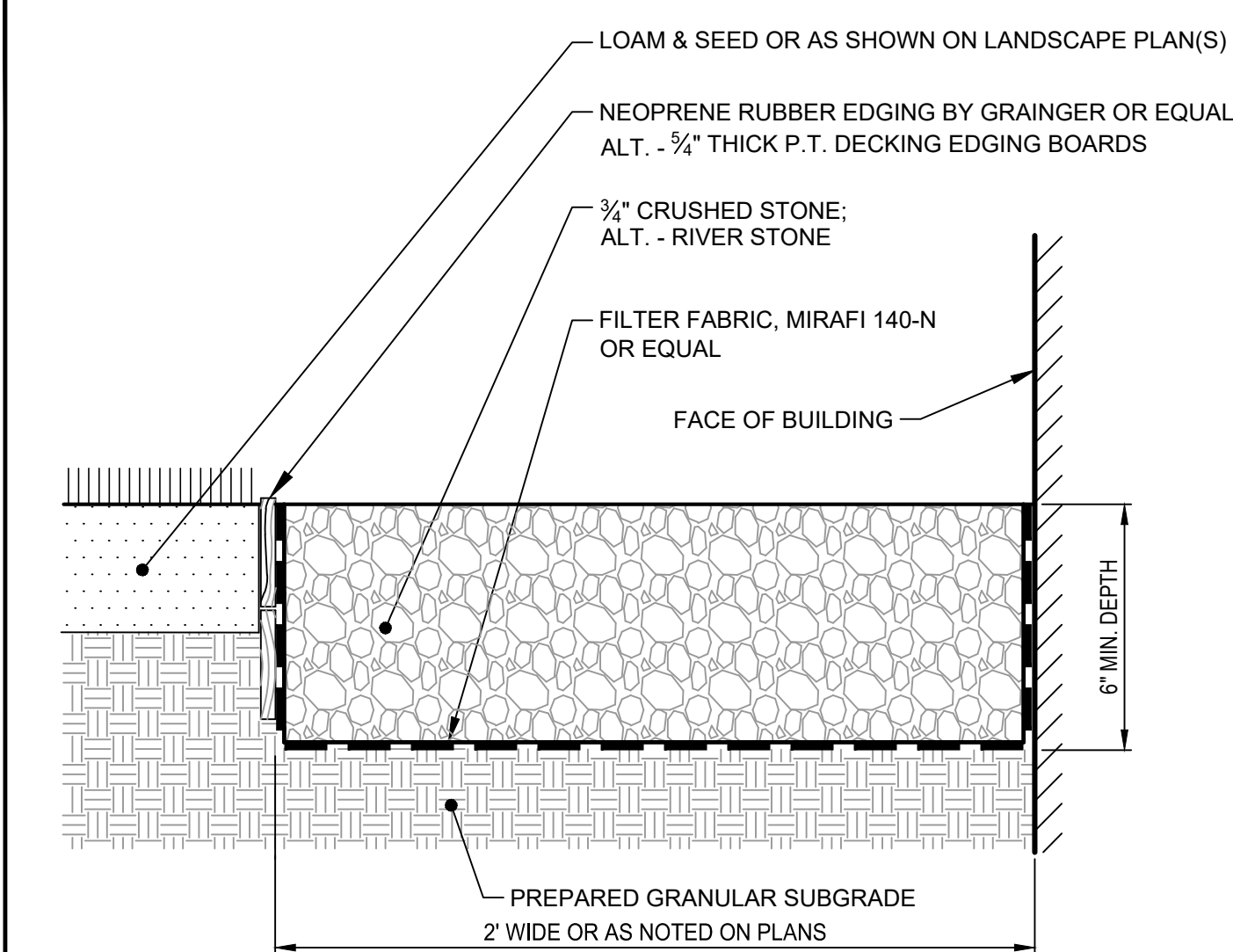
SCHEDULE			
CULVERT DIAMETER (D)	WIDTH (W)	LENGTH (L)	STONE D ₅₀
12"	8'	10'	6"
15"	8'	10'	6"
18"	10'	14'	6"
24"	12'	16'	9"
30"	12'	16'	12"
36"	20'	24'	12"
42"	24'	26'	12"
48"	28'	32'	12"

NOTE:
RIPRAP GRADATION AND PLACEMENT - THE RIPRAP GRADATION SHALL BE A WELL-GRADED MIX FROM ABOUT 1.5 TIMES THE D SIZE TO ABOUT 25 PERCENT OF THE D SIZE. THE RIPRAP STONES SHALL BE CAREFULLY PLACED WORKING FROM THE TOE OF THE SLOPE UPWARD. THE STONES SHOULD BE LOWERED TO THE SLOPE AND NOT BE ALLOWED TO DROP MORE THAN 12 INCHES ONTO THE GEOTEXTILE. THE FINISHED SURFACE SHALL BE A RELATIVELY SMOOTH UNIFORMLY SLOPED SURFACE.

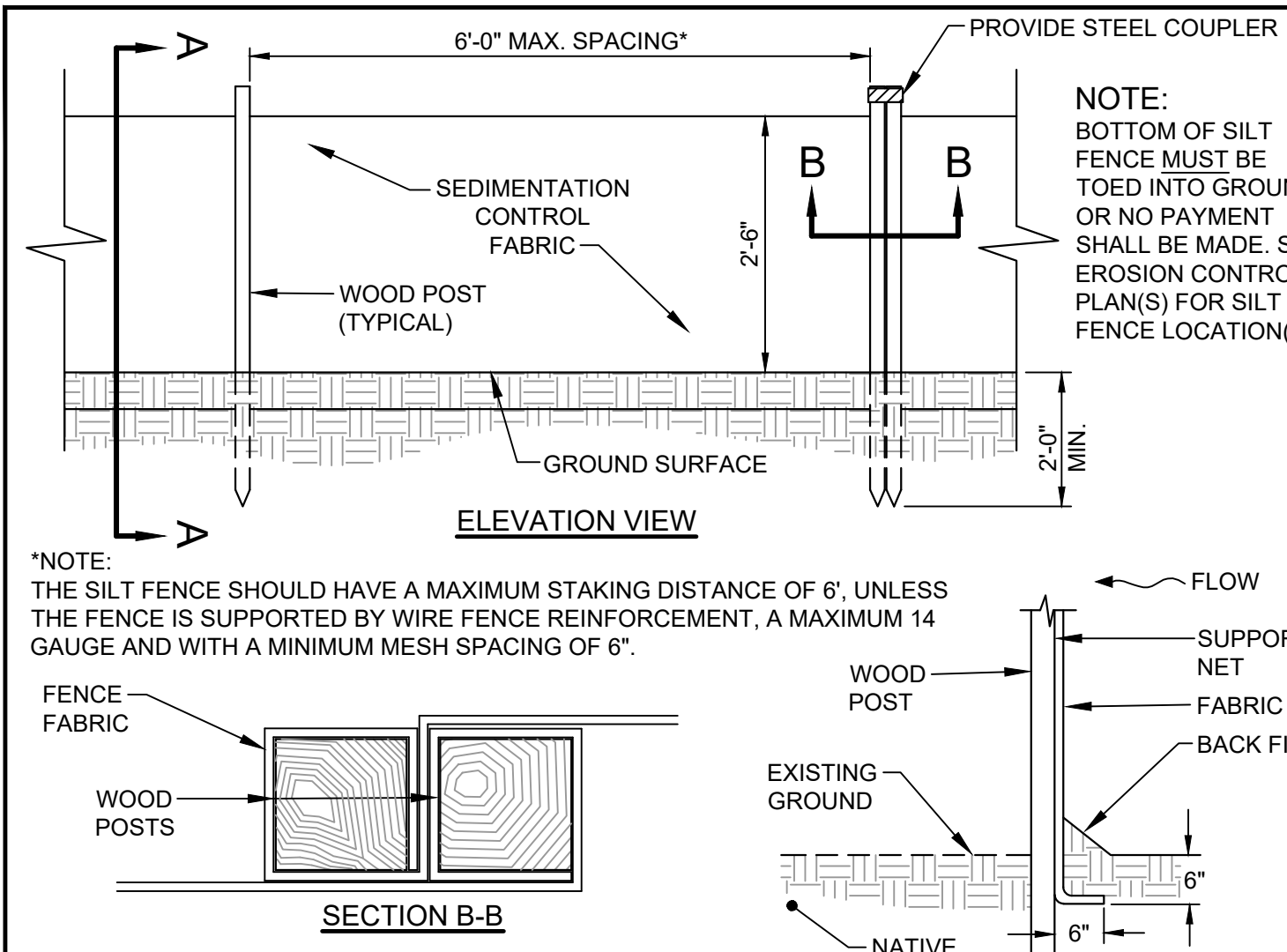
C PIPE/CULVERT OUTLET APRON
N.T.S.



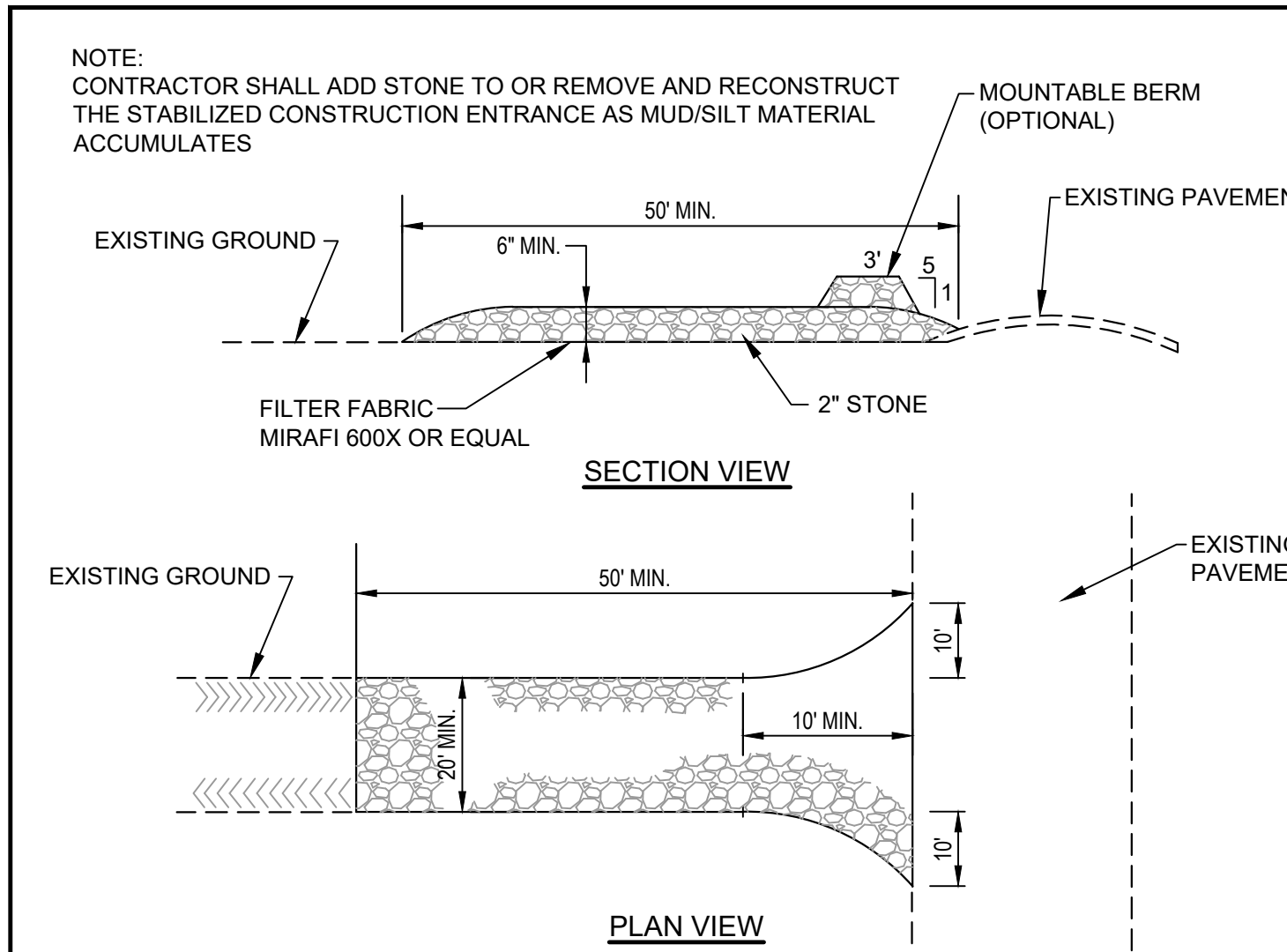
E EROSION CONTROL MESH
N.T.S.



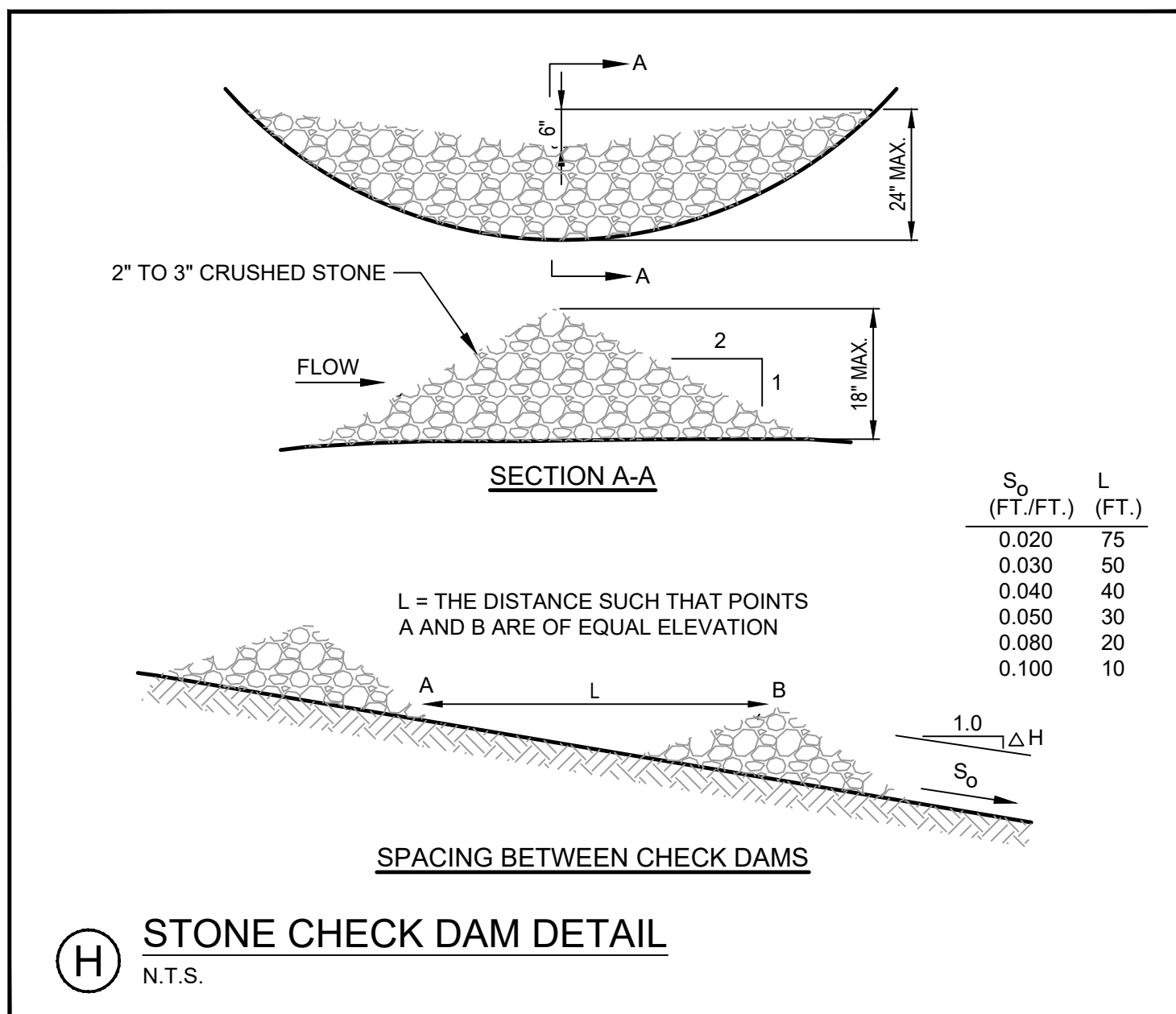
F STONE EDGE AGAINST BLDG. FACE DETAIL
N.T.S.



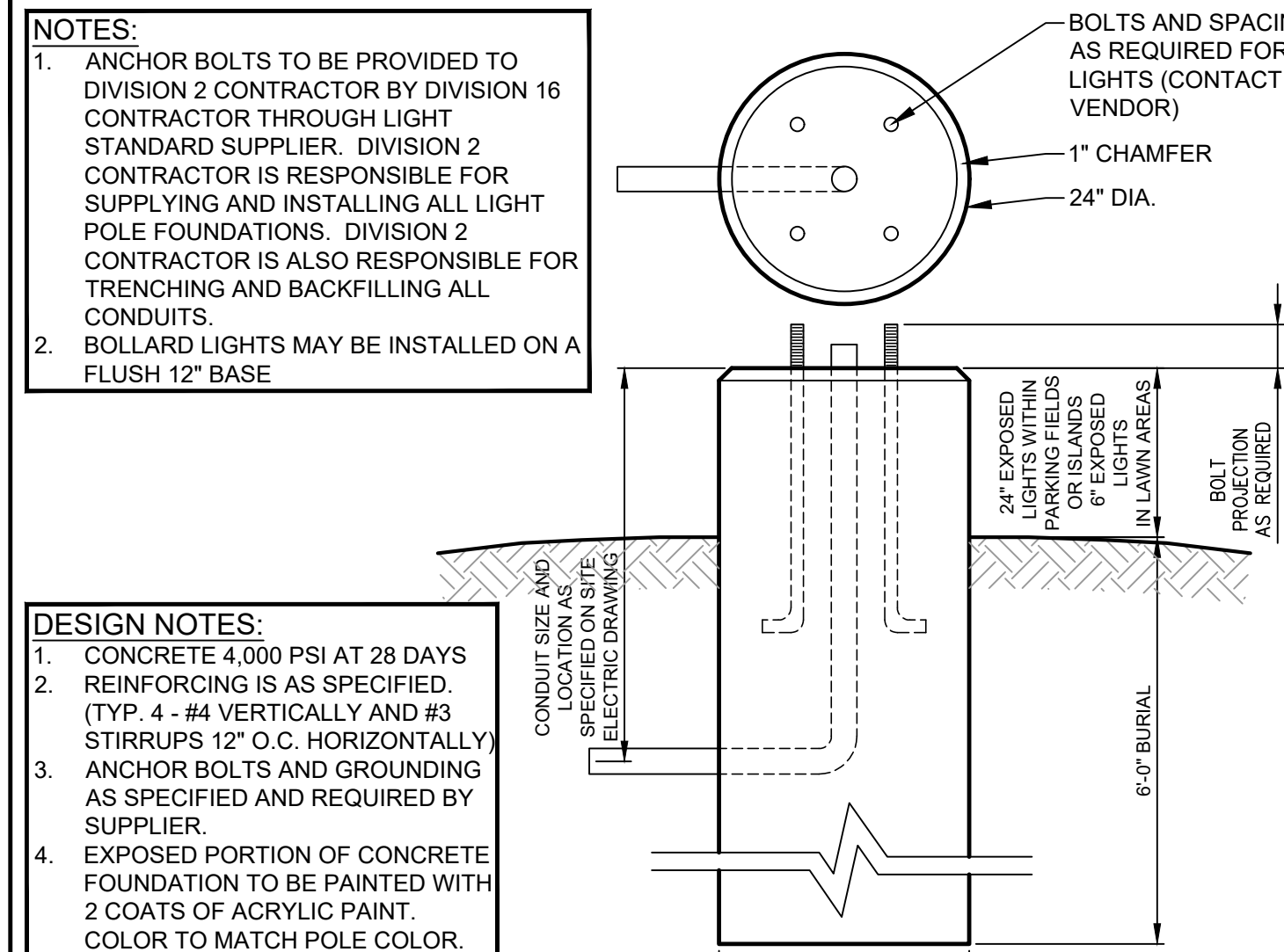
D SILTATION FENCE DETAIL
N.T.S.



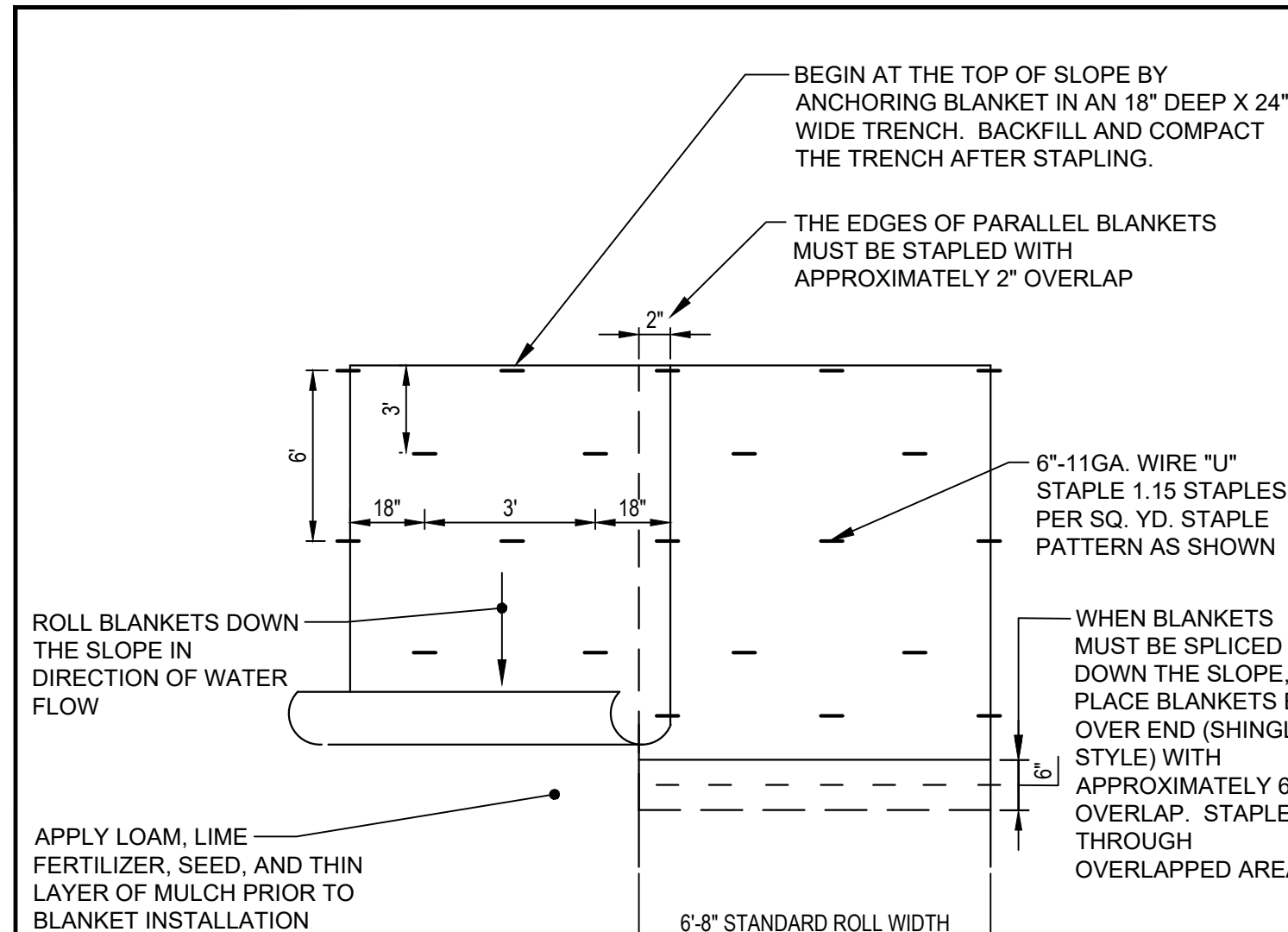
G STABILIZED CONSTRUCTION ENTRANCE DETAIL
N.T.S.



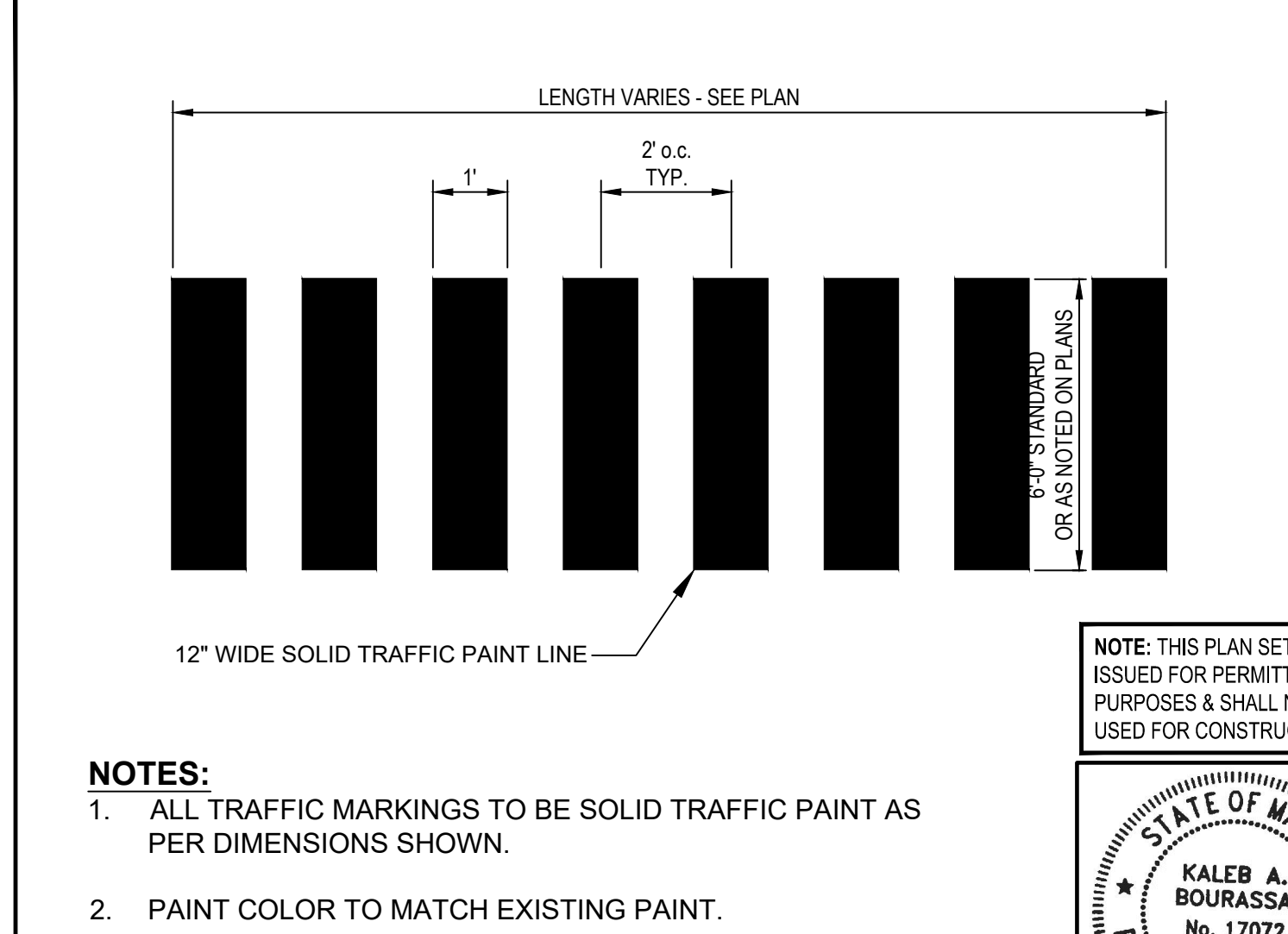
H STONE CHECK DAM DETAIL
N.T.S.



I LIGHT POLE BASE DETAIL
N.T.S.



J EROSION CONTROL BLANKET SLOPE STABILIZATION DETAIL
N.T.S.



K CROSSWALK STRIPING DETAIL
N.T.S.

Design: KAB	Draft: CDD	Date: JUNE 2024
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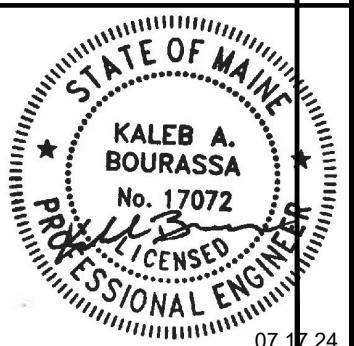


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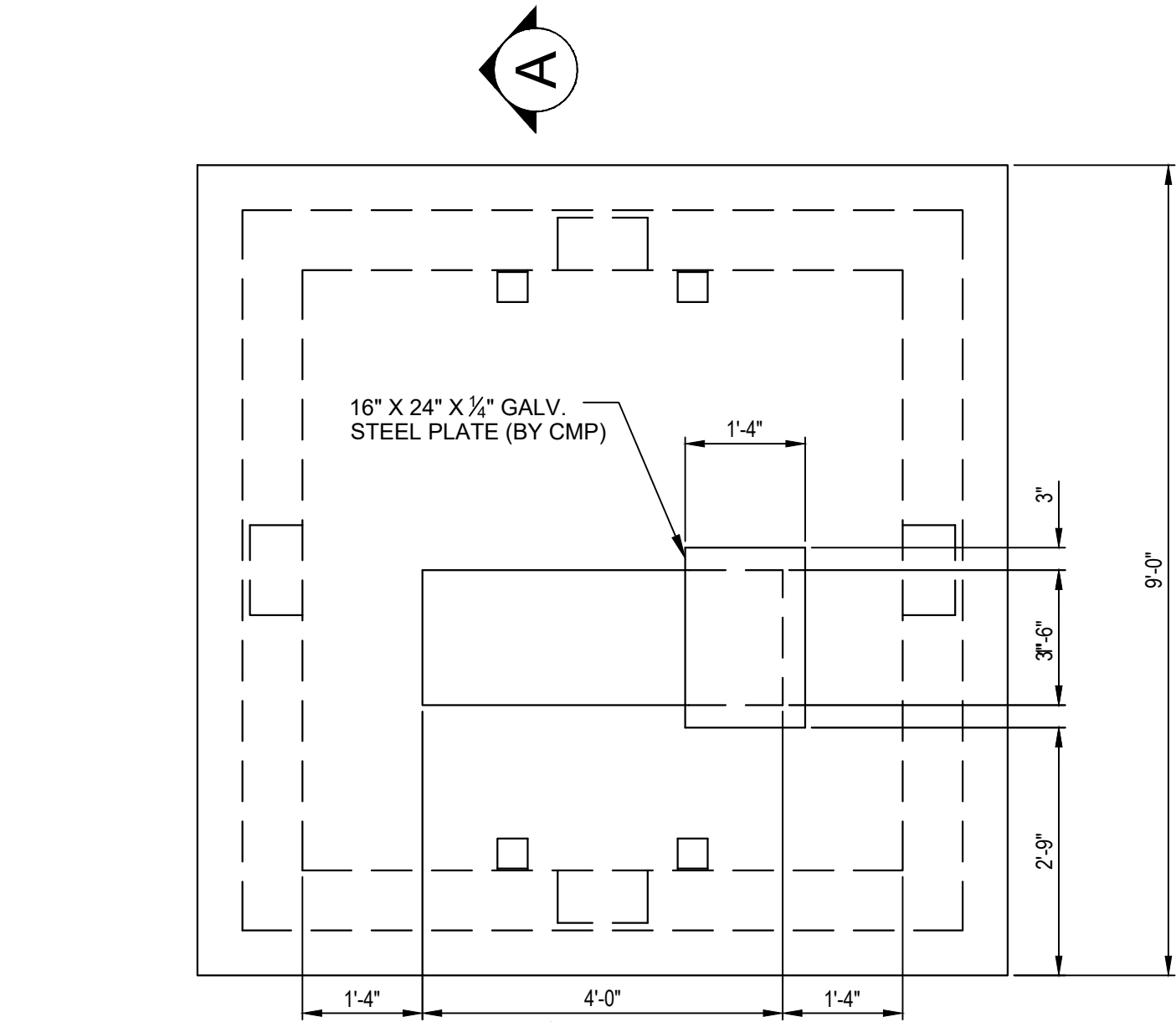
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Project:	PROPOSED RESIDENTIAL DEVELOPMENT 37 BARRA ROAD, BIDDEFORD, MAINE
Client:	WESTBROOK DEVELOPMENT CORPORATION 30 LIZA HARMON DRIVE, WESTBROOK, ME 04092

Drawing No.	C-6.2
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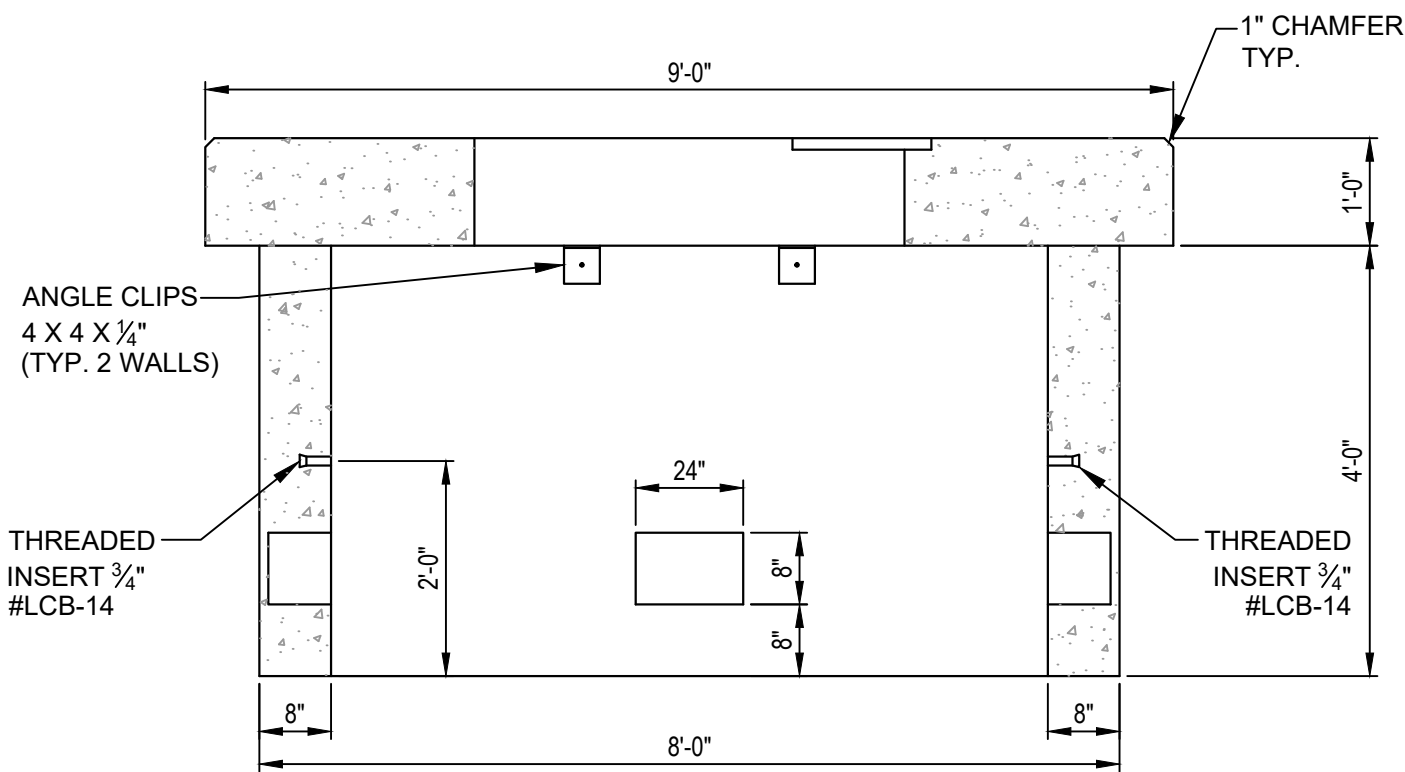
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LIC. #17072



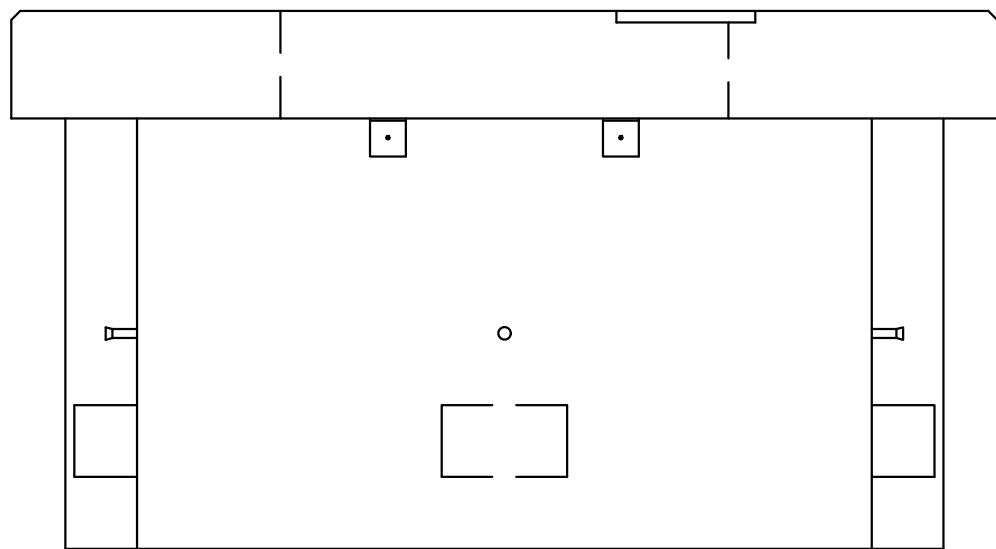
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PLAN VIEW



SECTION VIEW



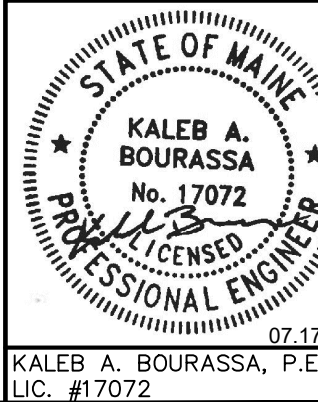
END VIEW

NOTES:

1. CONCRETE MINIMUM COMPRESSIVE STRENGTH 4,000 PSI @ 28 DAYS WITH STEEL REINFORCEMENT.
2. AS PER CENTRAL MAINE POWER COMPANY SPECIFICATIONS.
3. ONE 8" x 24" KNOCKOUT PROVIDED EACH WALL.
4. FOR 750 - 5000 KVA THREE PHASE TRANSFORMER.
5. FINISH GRADE SHALL BE GRADED TO ALLOW SURFACE WATER TO FLOW AWAY FROM THE PAD.

A 9'-0" TRANSFORMER PAD
N.T.S.

NOTE: THIS PLAN SET IS
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KALEB A. BOURASSA, P.E.
LIC. #17072

Rev.	Date	Revision

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Drawing Name:	MISCELLANEOUS DETAILS
Project:	PROPOSED RESIDENTIAL DEVELOPMENT 37 BARRA ROAD, BIDDEFORD, MAINE
Client:	WESTBROOK DEVELOPMENT CORPORATION 30 LIZA HARMON DRIVE, WESTBROOK, ME 04092

Drawing No.

C-6.3

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1.3.5 EROSION CONTROL MEASURES AND SITE STABILIZATION

THE PRIMARY EMPHASIS OF THE EROSION/SEDIMENTATION CONTROL PLAN, WHICH WILL BE IMPLEMENTED FOR THIS PROJECT, IS AS FOLLOWS:

- DEVELOPMENT OF A CAREFUL CONSTRUCTION SEQUENCE.
- RAPID REVEGETATION OF DENUDED AREAS TO MINIMIZE THE PERIOD OF SOIL EXPOSURE.
- RAPID STABILIZATION OF DRAINAGE PATHS TO AVOID RILL AND GULLY EROSION.
- THE USE OF ON-SITE MEASURES TO CAPTURE SEDIMENT (HAY BALES/ STONE CHECK DAMS/SILT FENCE, ETC.)

THE FOLLOWING TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL DEVICES WILL BE IMPLEMENTED AS PART OF THE SITE DEVELOPMENT. THESE DEVICES SHALL BE INSTALLED AS INDICATED ON THE PLANS OR AS DESCRIBED WITHIN THIS REPORT. FOR FURTHER REFERENCE, SEE THE LATEST EDITION OF THE MAINE EROSION AND SEDIMENT CONTROL PRACTICES FIELD GUIDE FOR CONTRACTORS.

A. DEWATERING

WATER FROM CONSTRUCTION TRENCH DEWATERING SHALL PASS FIRST THROUGH A FILTER BAG OR SECONDARY CONTAINMENT STRUCTURE (E.G. HAY BALE LINED POOL) PRIOR TO DISCHARGE. THE DISCHARGE SITE SHALL BE SELECTED TO AVOID FLOODING, ICING, AND SEDIMENT DISCHARGES TO A PROTECTED RESOURCE. IN NO CASE SHALL THE FILTER BAG OR CONTAINMENT STRUCTURE BE LOCATED WITHIN 50 FEET OF A PROTECTED NATURAL RESOURCE. DEWATERING DISCHARGE SHALL NOT BE DIRECTED ACROSS ADJACENT PROPERTIES IN A CONCENTRATED MANNER.

B. INSPECTION AND MONITORING

MAINTENANCE MEASURES SHALL BE ASSESSED AS NEEDED DURING THE ENTIRE CONSTRUCTION SEASON. AFTER EACH RAINFALL, SNOW STORM OR PERIOD OF THAWING AND RUNOFF, THE SITE CONTRACTOR SHALL PERFORM A VISUAL INSPECTION OF ALL INSTALLED EROSION CONTROL MEASURES AND PERFORM REPAIRS AS NEEDED TO INSURE THEIR CONTINUOUS FUNCTION. FOLLOWING THE TEMPORARY AND/OR FINAL SEEDING AND MULCHING, THE CONTRACTOR SHALL IN THE SPRING INSPECT AND REPAIR ANY DAMAGES AND/OR UNSTABILIZED SPOTS. ESTABLISHED VEGETATIVE COVER MEANS A MINIMUM OF 90% OF AREAS VEGETATED WITH VIGOROUS GROWTH.

THE FOLLOWING STANDARDS MUST BE MET DURING CONSTRUCTION.

(a) **INSPECTION AND CORRECTIVE ACTION.** INSPECT DISTURBED AND IMPERVIOUS AREAS, EROSION CONTROL MEASURES, MATERIALS STORAGE AREAS THAT ARE EXPOSED TO PRECIPITATION, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE. INSPECT THESE AREAS AT LEAST ONCE A WEEK AS WELL AS BEFORE AND WITHIN 24 HOURS AFTER A STORM EVENT (RAINFALL) AND PRIOR TO COMPLETING PERMANENT STABILIZATION MEASURES. A PERSON WITH KNOWLEDGE OF EROSION AND STORMWATER CONTROL, INCLUDING THE STANDARDS AND CONDITIONS IN THE PERMIT, SHALL CONDUCT THE INSPECTIONS.

(b) **MAINTENANCE.** IF BEST MANAGEMENT PRACTICES (BMPs) NEED TO BE REPAIRED, THE REPAIR WORK SHOULD BE INITIATED UPON DISCOVERY OF THE PROBLEM BUT NO LATER THAN THE END OF THE NEXT WORKDAY. IF ADDITIONAL BMPs OR SIGNIFICANT REPAIR OF BMPs ARE NECESSARY, IMPLEMENTATION MUST BE COMPLETED WITHIN 7 CALENDAR DAYS AND PRIOR TO ANY STORM EVENT (RAINFALL). ALL MEASURES MUST BE MAINTAINED IN EFFECTIVE OPERATING CONDITION UNTIL AREAS ARE PERMANENTLY STABILIZED.

(c) **DOCUMENTATION.** KEEP A LOG (REPORT) SUMMARIZING THE INSPECTIONS AND ANY CORRECTIVE ACTION TAKEN. THE LOG MUST INCLUDE THE NAME(S) AND QUALIFICATIONS OF THE PERSON MAKING THE INSPECTIONS, THE DATE(S) OF THE INSPECTIONS, AND MAJOR OBSERVATIONS ABOUT THE OPERATION AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROLS, MATERIALS STORAGE AREAS, AND VEHICLE ACCESS POINTS TO THE PARCEL. MAJOR OBSERVATIONS MUST INCLUDE BMPs THAT NEED MAINTENANCE, BMPs THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION, AND LOCATION(S) WHERE ADDITIONAL BMPs ARE NEEDED. FOR EACH BMP REQUIRING MAINTENANCE, BMP NEEDING REPLACEMENT, AND LOCATION NEEDING ADDITIONAL BMPs, NOTE IN THE LOG THE CORRECTIVE ACTION TAKEN AND WHEN IT WAS TAKEN.

THE LOG MUST BE MADE ACCESSIBLE TO CITY STAFF AND A COPY MUST BE PROVIDED UPON REQUEST. THE PERMITTEE SHALL RETAIN A COPY OF THE LOG FOR A PERIOD OF AT LEAST THREE YEARS FROM THE COMPLETION OF PERMANENT STABILIZATION.

C. TEMPORARY EROSION CONTROL MEASURES

TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED BY THE CONTRACTOR AS REQUIRED BY THIS REPORT AND AS SHOWN ON THE PLAN SET FOR THE PROJECT. ADDITIONAL EROSION CONTROL MEASURES SHALL BE INSTALLED IF DEEMED NECESSARY BY ON-SITE INSPECTIONS OF THE OWNER, THE CITY OF BIDDEFORD, OR THEIR REPRESENTATIVES AT NO ADDITIONAL COST TO THE OWNER.

THE FOLLOWING MEASURES ARE PLANNED AS TEMPORARY EROSION/SEDIMENTATION CONTROL MEASURES DURING CONSTRUCTION:

1. CRUSHED STONE-STABILIZED CONSTRUCTION ENTRANCE SHALL BE PLACED AT THE ENTRANCE TO EACH CONSTRUCTION AREA.
2. SILTATION FENCE OR WOOD WASTE COMPOST BERMS SHALL BE INSTALLED DOWNSTREAM OF ANY DISTURBED AREAS TO TRAP RUNOFF. BORNE SEDIMENTS UNTIL GRASS AREAS ARE REVEGETATED. THE SILT FENCE AND/OR WOOD WASTE COMPOST BERMS SHALL BE INSTALLED PER THE DETAILS PROVIDED IN THIS PACKAGE AND INSPECTED AT LEAST ONCE A WEEK AND BEFORE AND IMMEDIATELY AFTER A STORM EVENT OF 0.5 INCHES OR GREATER, AND AT LEAST DAILY DURING PROLONGED RAINFALL. REPAIRS SHALL BE MADE IF THERE ARE ANY SIGNS OF EROSION OR SEDIMENTATION BELOW THE FENCE OR BERM LINE. IF THERE ARE SIGNS OF UNDERCUTTING AT THE CENTER OR THE EDGES, OR IMPOUNDING OF LARGE VOLUMES OF WATER BEHIND THE FENCE OR BERM, THE BARRIER SHALL BE REPLACED WITH A STONE CHECK DAM. WOOD WASTE COMPOST BERMS ARE NOT TO BE USED ADJACENT TO WETLAND AREAS THAT ARE NOT TO BE DISTURBED.
3. STRAW OR HAY MULCH INCLUDING HYDROSEEDING IS INTENDED TO PROVIDE COVER FOR DENUDED OR SEEDED AREAS UNTIL RECH PLACED BETWEEN APRIL 15TH AND OCTOBER 15TH ON SLOPES OF LESS THEN 15 PERCENT SHALL BE ANCHORED BY APPLYING WATER; MULCH PLACED ON SLOPES OF EQUAL TO OR STEEPER THAN 15 PERCENT SHALL BE COVERED BY A FABRIC NETTING AND ANCHORED WITH STAPLES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION. FABRIC NETTING AND STAPLES SHALL BE USED ON DISTURBED AREAS WITHIN 50' OF LAKES, STREAMS, AND WETLANDS REGARDLESS OF THE UPSTREAM SLOPE. MULCH PLACED BETWEEN OCTOBER 15TH AND APRIL 15TH ON SLOPES EQUAL TO OR STEEPER THAN 8 PERCENT SHALL BE COVERED WITH A FABRIC NETTING AND ANCHORED WITH STAPLES IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. SLOPES STEEPER THAN 3:1 AND EQUAL TO OR FLATTER THAN 2:1, WHICH ARE TO BE REVEGETATED, SHALL RECEIVE CURLEX BLANKETS BY AMERICAN EXCELSIOR OR EQUAL. SLOPES STEEPER THAN 2:1 SHALL RECEIVE RIPRAP AS NOTED ON THE PLANS. THE MULCH APPLICATION RATE FOR BOTH TEMPORARY AND PERMANENT SEEDING IS 75 LBS PER 1000 SF AS IDENTIFIED IN ATTACHMENT A OF THIS SECTION. MULCH SHALL NOT BE PLACED OVER SNOW.
4. TEMPORARY STOCKPILES OF STUMPS, GRUBBINGS, OR COMMON EXCAVATION WILL BE PROTECTED AS FOLLOWS:
 - a) TEMPORARY STOCKPILES SHALL NOT BE LOCATED WITHIN 100 FEET OF ANY WETLANDS WHICH WILL NOT BE DISTURBED AND SHALL BE LOCATED AWAY FROM DRAINAGE SWALES.
 - b) STOCKPILES SHALL BE STABILIZED WITHIN 7 DAYS BY EITHER TEMPORARILY SEEDING THE STOCKPILE BY A HYDROSEED METHOD CONTAINING AN EMULSIFIED MULCH TACKIFIER OR BY COVERING THE STOCKPILE WITH MULCH, SUCH AS HAY, STRAW, OR EROSION CONTROL MIX.
 - c) STOCKPILES SHALL BE SURROUNDED BY SEDIMENTATION BARRIER AT THE TIME OF FORMATION.
5. ALL DENUDED AREAS THAT ARE WITHIN 100 FEET OF AN UNDISTURBED WETLAND, WHICH HAVE BEEN ROUGH GRADED AND ARE NOT LOCATED WITHIN A BUILDING PAD, PARKING AREA, OR ACCESS DRIVE SUBBASE AREA, SHALL RECEIVE MULCH OR EROSION CONTROL MESH FABRIC WITHIN 48 HOURS OF INITIAL DISTURBANCE OF SOIL. ALL AREAS WITHIN 100 FEET OF AN UNDISTURBED WETLAND SHALL BE MULCHED PRIOR TO ANY PREDICTED RAIN EVENT REGARDLESS OF THE 48 HOUR WINDOW. IN OTHER AREAS, THE TIME PERIOD MAY BE EXTENDED TO 7 DAYS.
6. FOR WORK, WHICH IS CONDUCTED BETWEEN OCTOBER 15TH AND APRIL 15TH OF ANY CALENDAR YEAR, ALL DENUDED AREAS SHALL BE COVERED WITH HAY MULCH OR EROSION CONTROL MIX, APPLIED AT TWICE THE NORMAL APPLICATION RATE AND ANCHORED WITH A FABRIC NETTING. THE TIME PERIOD FOR APPLYING MULCH SHALL BE LIMITED TO 2 DAYS FOR ALL AREAS.
7. BARRA ROAD SHALL BE SWEPT TO CONTROL MUD AND DUST AS NECESSARY. ADDITIONAL STONE SHALL BE ADDED TO THE STABILIZED CONSTRUCTION ENTRANCE TO MINIMIZE THE TRACKING OF MATERIAL OFF THE SITE AND ONTO THE SURROUNDING ROADWAYS.
8. DURING GRUBBING OPERATIONS STONE CHECK DAMS SHALL BE INSTALLED AT ANY EVIDENT CONCENTRATED FLOW DISCHARGE POINTS AND AS DIRECTED ON THE EROSION CONTROL PLANS.

9. SILT FENCING WITH A MINIMUM STAKE SPACING OF 6 FEET SHALL BE USED, UNLESS THE FENCE IS SUPPORTED BY WIRE FENCE REINFORCEMENT OF MINIMUM 14 GAUGE AND WITH A MAXIMUM MESH SPACING OF 6 INCHES, IN WHICH CASE STAKES MAY BE SPACED A MAXIMUM OF 10 FEET APART. THE BOTTOM OF THE FENCE SHALL BE ANCHORED. A DOUBLE ROW OF SILT FENCE SHALL BE USED ADJACENT TO WETLANDS.
10. WOOD WASTE COMPOST/BARK BERMS MAY BE USED IN LIEU OF SILTATION FENCING. BERMS SHALL BE REMOVED AND SPREAD IN A LAYER NOT TO EXCEED 3" THICK ONCE UPSTREAM AREAS ARE COMPLETED AND A 90% CATCH OF VEGETATION IS ATTAINED.
11. STORM DRAIN CATCH BASIN INLET PROTECTION SHALL BE PROVIDED THROUGH THE USE OF STONE SEDIMENT BARRIERS OR APPROVED SEDIMENT BAGS (SUCH AS SILT SACK). INSTALLATION DETAILS ARE PROVIDED IN THE PLAN SET. THE BARRIERS SHALL BE INSPECTED AFTER EACH RAINFALL AND REPAIRS MADE AS NECESSARY. SEDIMENT SHALL BE REMOVED AND THE BARRIER RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ½ THE DESIGN DEPTH OF THE BARRIER. THE BARRIER SHALL BE REMOVED WHEN THE TRIBUTARY DRAINAGE AREA HAS BEEN STABILIZED.
12. WATER AND/OR CALCIUM CHLORIDE SHALL BE FURNISHED AND APPLIED IN ACCORDANCE WITH MDOT SPECIFICATIONS - SECTION 637 - DUST CONTROL.
13. LOAM AND SEED IS INTENDED TO SERVE, AS THE PRIMARY PERMANENT REVEGETATIVE MEASURE FOR ALL DENUDED AREAS NOT PROVIDED WITH OTHER EROSION CONTROL MEASURES, SUCH AS RIPRAP. APPLICATION RATES ARE PROVIDED IN ATTACHMENT A OF THIS SECTION. SEEDING SHALL NOT OCCUR OVER SNOW.

D. PERMANENT EROSION CONTROL MEASURES

THE FOLLOWING PERMANENT EROSION CONTROL MEASURES HAVE BEEN DESIGNED AS PART OF THE EROSION/SEDIMENTATION CONTROL PLAN:

1. ALL AREAS DISTURBED DURING CONSTRUCTION, BUT NOT SUBJECT TO OTHER RESTORATION (PAVING, RIPRAP, ETC.) WILL BE LOAMED, LIMED, FERTILIZED, MULCHED, AND SEEDED. FABRIC NETTING, ANCHORED WITH STAPLES, SHALL BE PLACED OVER THE MULCH IN AREAS AS NOTED IN **TEMPORARY EROSION CONTROL MEASURES** PARAGRAPH 3 OF THIS REPORT. ALL AREAS WITHIN 100 FEET OF AN UNDISTURBED WETLAND SHALL BE MULCHED PRIOR TO ANY PREDICTED RAIN EVENT REGARDLESS OF THE 48 HOUR WINDOW. NATIVE TOPSOIL SHALL BE STOCKPILED AND REUSED FOR FINAL RESTORATION WHEN IT IS OF SUFFICIENT QUALITY.
2. ALL STORM DRAIN PIPE OUTLETS SHALL HAVE RIPRAP APRONS AT THEIR OUTLET TO PROTECT THE OUTLET AND RECEIVING CHANNEL FROM SCOUR AND DETERIORATION. INSTALLATION DETAILS ARE PROVIDED IN THE PLAN SET. THE APRONS SHALL BE INSTALLED AND STABILIZED TO THE EXTENT PRACTICABLE PRIOR TO DIRECTING RUNOFF TO THE TRIBUTARY PIPE OR CULVERT.

1.4 IMPLEMENTATION SCHEDULE

THE FOLLOWING CONSTRUCTION SEQUENCE SHALL BE REQUIRED TO ENSURE THE EFFECTIVENESS OF THE EROSION AND SEDIMENTATION CONTROL MEASURES ARE OPTIMIZED:

IT IS ANTICIPATED THAT CONSTRUCTION WILL COMMENCE IN SPRING OF 2025 AND BE COMPLETED BY FALL OF 2026.

NOTE: FOR ALL GRADING ACTIVITIES, THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION NOT TO OVEREXPOSE THE SITE, THIS SHALL BE ACCOMPLISHED BY LIMITING THE DISTURBED AREA.

1. INSTALL STABILIZED CONSTRUCTION ENTRANCE AT CONSTRUCTION ACCESS POINTS FROM PAVED ROADWAYS.
2. INSTALL CATCH BASIN INLET PROTECTION, AND PERIMETER SILT FENCE/WOOD WASTE BERMS PRIOR TO GRUBBING RESPECTIVE AREAS.
3. CLEAR AND GRUB AREA TO BE DEVELOPED. INSTALL STONE CHECK DAMS AT ANY EVIDENT CONCENTRATED FLOW DISCHARGE POINTS.
4. FOUNDATION PREPARATION AREA SHALL BE EXCAVATED FOR INSTALLATION OF THE BUILDING FOOTINGS. BUILDING WORK WILL BE ON GOING THROUGH THE REMAINDER OF THE PROJECT.
5. COMMENCE INSTALLATION OF DRAINAGE APPURTENANCES.
6. COMMENCE CONSTRUCTION OF PERVIOUS PAVER FILTER/RESERVOIR UP TO CHOKER COURSE, FOCAL POINT FILTERS AND / OR DETENTION PONDS.
7. COMMENCE EARTHWORK AND GRADING TO SUBGRADE.
8. COMMENCE INSTALLATION OF UTILITIES.
9. CONTINUE EARTHWORK AND GRADING TO SUBGRADE AS NECESSARY FOR CONSTRUCTION.
10. COMPLETE INSTALLATION OF UNDERGROUND UTILITIES TO WITHIN 5' OF THE BUILDINGS.
11. INSTALL LIGHT POLE FOUNDATIONS AND LIGHT POLES.
12. COMPLETE REMAINING EARTHWORK OPERATIONS.
13. COMPLETE INSTALLATION OF CATCH BASINS AND APPURTENANCES.
14. INSTALL SUB-BASE AND BASE GRAVEL WITHIN PARKING FIELDS, WALKWAYS, AND ALL DRIVEWAYS.
15. INSTALL BASE COURSE PAVING FOR ACCESS DRIVE AND PARKING AREA AS WELL AS CONCRETE SURFACES.
16. INSTALL CURBING IN PARKING FIELDS, DRIVEWAYS, AND ALONG THE ACCESS DRIVES AS NEEDED.
17. LOAM, LIME, FERTILIZE, SEED AND MULCH DISTURBED AREAS AND COMPLETE ALL LANDSCAPING.
18. INSTALL PERVIOUS PAVERS AND INFILL STONE, SURFACE COURSE PAVING FOR ACCESS DRIVE AND PARKING AREAS, STRIPE PER PLAN.
19. ONCE THE SITE IS STABILIZED AND A 90% CATCH OF VEGETATION HAS BEEN OBTAINED, REMOVE ALL TEMPORARY EROSION CONTROL MEASURES.
20. TOUCH UP LOAM AND SEED.

NOTE: ALL DENUDED AREAS NOT SUBJECT TO FINAL PAVING, RIPRAP, OR GRAVEL SHALL BE REVEGETATED.

PRIOR TO CONSTRUCTION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT TO THE OWNER A SCHEDULE FOR THE COMPLETION OF THE WORK, WHICH WILL SATISFY THE FOLLOWING CRITERIA:

1. THE ABOVE CONSTRUCTION SEQUENCE SHOULD GENERALLY BE COMPLETED IN THE SPECIFIED ORDER; HOWEVER, SEVERAL SEPARATE ITEMS MAY BE CONSTRUCTED SIMULTANEOUSLY. WORK MUST ALSO BE SCHEDULED OR PHASED TO REDUCE THE EXTENT OF THE EXPOSED AREAS AS SPECIFIED BELOW. THE INTENT OF THIS SEQUENCE IS TO PROVIDE FOR EROSION CONTROL AND TO HAVE STRUCTURAL MEASURES SUCH AS SILT FENCE AND CONSTRUCTION ENTRANCES IN PLACE BEFORE LARGE AREAS OF LAND ARE DENUDED.
2. THE WORK SHALL BE CONDUCTED IN SECTIONS WHICH SHALL:
 - a) LIMIT THE AMOUNT OF EXPOSED AREA TO THOSE AREAS IN WHICH WORK IS EXPECTED TO BE UNDERTAKEN DURING THE PROCEEDING 30 DAYS.
 - b) REVEGETATE DISTURBED AREAS AS RAPIDLY AS POSSIBLE. ALL AREAS SHALL BE PERMANENTLY STABILIZED WITHIN 7 DAYS OF FINAL GRADING OR BEFORE A STORM EVENT; OR TEMPORARILY STABILIZED WITHIN 48 HOURS OF INITIAL DISTURBANCE OF SOIL FOR AREAS WITHIN 100 FEET OF AN UNDISTURBED WETLAND AND 7 DAYS FOR ALL OTHER AREAS. AREAS WITHIN 100 FEET OF AN UNDISTURBED WETLAND SHALL BE MULCHED PRIOR TO ANY PREDICTED RAIN EVENT REGARDLESS OF THE 48 HOUR WINDOW.
 - c) INCORPORATE PLANNED INLETS AND DRAINAGE SYSTEM AS EARLY AS POSSIBLE INTO THE CONSTRUCTION PHASE. THE DITCHES SHALL BE IMMEDIATELY LINED OR REVEGETATED AS SOON AS THEIR INSTALLATION IS COMPLETE.

1.5 EROSION, SEDIMENTATION AND STABILIZATION CONTROL PLAN

THE EROSION CONTROL PLAN IS INCLUDED IN THE PLAN SET.

1.6 DETAILS AND SPECIFICATIONS

THE EROSION CONTROL DETAILS AND SPECIFICATIONS ARE INCLUDED IN THE PLAN SET.

1.7 WINTER STABILIZATION PLAN

THE WINTER CONSTRUCTION PERIOD IS FROM NOVEMBER 1 THROUGH APRIL 15. IF THE CONSTRUCTION SITE IS NOT STABILIZED WITH PAVEMENT, A ROAD GRAVEL BASE, 75% MATURE VEGETATION COVER OR RIPRAP BY NOVEMBER 15 THEN THE SITE NEEDS TO BE PROTECTED WITH OVER-WINTER STABILIZATION. AN AREA CONSIDERED OPEN IS ANY AREA NOT STABILIZED WITH PAVEMENT; VEGETATION; MULCHING; EROSION CONTROL MATS; RIPRAP OR GRAVEL BASE ON A ROAD.

WINTER EXCAVATION AND EARTHWORK SHALL BE COMPLETED SUCH THAT ANY AREA LEFT EXPOSED CAN BE CONTROLLED BY THE CONTRACTOR. LIMIT THE EXPOSED AREA TO THOSE AREAS IN WHICH WORK IS EXPECTED TO BE UNDERTAKEN DURING THE PROCEEDING 15 DAYS AND THAT CAN BE MULCHED IN ONE DAY PRIOR TO ANY SNOW EVENT.

ALL AREAS SHALL BE CONSIDERED TO BE DENUDED UNTIL THE SUBBASE GRAVEL IS INSTALLED IN ROADWAY/PARKING AREAS OR THE AREAS OF FUTURE LOAM AND SEED HAVE BEEN LOAMED, SEEDED AND MULCHED. HAY AND STRAW MULCH RATE SHALL BE A MINIMUM OF 150 LBS/1,000 S.F. (3 TONS/ACRE) AND SHALL BE PROPERLY ANCHORED.

THE CONTRACTOR SHALL INSTALL ANY ADDED MEASURES WHICH MAY BE NECESSARY TO CONTROL EROSION/SEDIMENTATION FROM THE SITE DEPENDENT UPON THE ACTUAL SITE AND WEATHER CONDITIONS. CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED, IN ORDER TO MINIMIZE AREAS WITHOUT EROSION CONTROL PROTECTION.

1. **SOIL STOCKPILES**
STOCKPILES OF SOIL OR SUBSOIL SHALL BE MULCHED FOR OVER WINTER PROTECTION WITH HAY OR STRAW AT TWICE THE NORMAL RATE OR AT 150 LBS/1,000 S.F. (3 TONS PER ACRE) OR WITH A FOUR-INCH LAYER OF WOODWASTE EROSION CONTROL MIX. THIS SHALL BE DONE WITHIN 7 DAYS OF STOCKPILING AND RE-STABILIZED PRIOR TO ANY RAINFALL OR SNOWFALL. ANY SOIL STOCKPILE SHALL NOT BE PLACED (EVEN COVERED WITH HAY OR STRAW) WITHIN 100 FEET FROM ANY NATURAL RESOURCES.
2. **NATURAL RESOURCE PROTECTION**
ANY AREAS WITHIN 100 FEET FROM ANY NATURAL RESOURCES, IF NOT STABILIZED WITH A MINIMUM OF 75% MATURE VEGETATION CATCH, SHALL BE MULCHED BY DECEMBER 1 AND ANCHORED WITH PLASTIC NETTING OR PROTECTED WITH EROSION CONTROL MATS. DURING WINTER CONSTRUCTION, A DOUBLE LINE OF SEDIMENT BARRIERS (I.E. SILT FENCE BACKED WITH HAY BALES OR EROSION CONTROL MIX) SHALL BE PLACED BETWEEN ANY NATURAL RESOURCE AND THE DISTURBED AREA. PROJECTS CROSSING THE NATURAL RESOURCE SHALL BE PROTECTED A MINIMUM DISTANCE OF 100 FEET ON EITHER SIDE FROM THE RESOURCE. EXISTING PROJECTS NOT STABILIZED BY DECEMBER 1 SHALL BE PROTECTED WITH THE SECOND LINE OF SEDIMENT BARRIER TO ENSURE FUNCTIONALITY DURING THE SPRING THAW AND RAINS.

3. **SEDIMENT BARRIERS**
DURING FROZEN CONDITIONS, SEDIMENT BARRIERS SHALL CONSIST OF WOODWASTE FILTER BERMS AS FROZEN SOIL PREVENTS THE PROPER INSTALLATION OF HAY BALES AND SEDIMENT SILT FENCES.

4. **MULCHING**
AN AREA SHALL BE CONSIDERED DENUDED UNTIL AREAS OF FUTURE LOAM AND SEED HAVE BEEN LOAMED, SEEDED AND MULCHED. HAY AND STRAW MULCH SHALL BE APPLIED AT A RATE OF 150 LB. PER 1,000 SQUARE FEET OR 3 TONS/ACRE (TWICE THE NORMAL ACCEPTED RATE OF 75-LBS/1,000 S.F. OR 1.5 TONS/ACRE) AND SHALL BE PROPERLY ANCHORED. MULCH SHALL NOT BE SPREAD ON TOP OF SNOW. THE SNOW SHALL BE REMOVED DOWN TO A ONE-INCH DEPTH OR LESS PRIOR TO APPLICATION. AFTER EACH DAY OF FINAL GRADING, THE AREA SHALL BE PROPERLY STABILIZED WITH ANCHORED HAY OR STRAW OR EROSION CONTROL MATTING. AN AREA SHALL BE CONSIDERED TO HAVE BEEN STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED WITH STRAW OR HAY AT A RATE OF 150 LB. PER 1,000 SQUARE FEET (3 TONS/ACRE) AND ADEQUATELY ANCHORED THAT GROUND SURFACE IS NOT VISIBLE THOUGH THE MULCH.

BETWEEN THE DATES OF NOVEMBER 1 AND APRIL 15, ALL MULCH SHALL BE ANCHORED BY PEG LINE, MULCH NETTING, ASPHALT EMULSION CHEMICAL, OR WOOD CELLULOSE FIBER. WHEN GROUND SURFACE IS NOT VISIBLE THROUGH THE MULCH THEN COVER IS SUFFICIENT. AFTER NOVEMBER 1ST, MULCH AND ANCHORING OF ALL BARE SOIL SHALL OCCUR AT THE END OF EACH FINAL GRADING WORKDAY.

5. **MULCHING ON SLOPES AND DITCHES**
SLOPES SHALL NOT BE LEFT EXPOSED FOR ANY EXTENDED TIME OF WORK SUSPENSION UNLESS FULLY MULCHED AND ANCHORED WITH HAY BALES OR NETTING OR WITH EROSION CONTROL BLANKETS. MULCHING SHALL BE APPLIED AT A RATE OF 230 LBS/1,000 S.F. ON ALL SLOPES GREATER THAN 8%.

MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH A SLOPE GREATER THAN 3% FOR SLOPES EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GREATER THAN 8%. EROSION CONTROL BLANKETS SHALL BE USED IN LIEU OF MULCH IN ALL DRAINAGE WAYS WITH SLOPES GREATER THAN 8%. EROSION CONTROL MIX CAN BE USED TO SUBSTITUTE EROSION CONTROL BLANKETS ON ALL SLOPES EXCEPT DITCHES.

6. **SEEDING**
BETWEEN THE DATES OF OCTOBER 15 AND APRIL 1ST, LOAM OR SEED WILL NOT BE REQUIRED. DURING PERIODS OF ABOVE FREEZING TEMPERATURES, SEEDING SHALL BE REQUIRED. SEEDING SHALL BE DONE PRIOR TO FINAL GRADING AND TEMPORARILY SEEDED AND MULCHED UNTIL SUCH TIME AS THE FINAL TREATMENT CAN BE APPLIED. IF THE DATE IS AFTER NOVEMBER 1ST AND IF THE EXPOSED AREA HAS BEEN LOAMED, FINAL GRADED WITH A UNIFORM SURFACE, THEN THE AREA MAY BE DORMANT SEEDED AT A RATE OF 3 TIMES HIGHER THAN SPECIFIED FOR PERMANENT SEED AND THEN MULCHED. DORMANT SEEDING MAY BE SELECTED TO BE PLACED PRIOR TO THE PLACEMENT OF MULCH AND FABRIC NETTING ANCHORED WITH STAPLES. IF DORMANT SEEDING IS USED FOR THE SITE, ALL DISTURBED AREAS SHALL RECEIVE 4TH OF LOAM AND SEED AT AN APPLICATION RATE OF 15 LBS/1,000 S.F. ALL AREAS SEEDED DURING THE WINTER SHALL BE INSPECTED IN THE SPRING FOR ADEQUATE CATCH. ALL AREAS INSUFFICIENTLY VEGETATED (LESS THAN 75% CATCH) SHALL BE REVEGETATED BY REPLACING LOAM, SEED AND MULCH. IF DORMANT SEEDING IS NOT USED FOR THE SITE, ALL DISTURBED AREAS SHALL BE REVEGETATED IN THE SPRING.

STANDARDS FOR TIMELY STABILIZATION OF CONSTRUCTION SITES DURING WINTER

1. **STANDARD FOR THE TIMELY STABILIZATION OF DITCHES AND CHANNELS** -- THE APPLICANT SHALL CONSTRUCT AND STABILIZE ALL STONE-LINED DITCHES AND CHANNELS ON THE SITE BY NOVEMBER 15. THE APPLICANT SHALL CONSTRUCT AND STABILIZE ALL GRASS-LINED DITCHES AND CHANNELS ON THE SITE BY SEPTEMBER 1. IF THE APPLICANT FAILS TO STABILIZE A DITCH OR CHANNEL TO BE GRASS-LINED BY SEPTEMBER 1, THEN THE APPLICANT WILL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE DITCH FOR LATE FALL AND WINTER.

INSTALL A SOD LINING IN THE DITCH -- THE APPLICANT SHALL LINE THE DITCH WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE APPLICANT PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL, AND ANCHORING THE SOD WITH JUTE OR PLASTIC MESH TO PREVENT THE SOD STRIPS FROM SLOUGHING DURING FLOW CONDITIONS.

INSTALL A STONE LINING IN THE DITCH --THE APPLICANT SHALL LINE THE DITCH WITH STONE RIPRAP BY NOVEMBER 15. THE APPLICANT SHALL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE AND LINING THICKNESS NEEDED TO WITHSTAND THE ANTICIPATED FLOW VELOCITIES AND FLOW DEPTHS WITHIN THE DITCH. IF NECESSARY, THE APPLICANT SHALL REGRADE THE DITCH PRIOR TO PLACING THE STONE LINING SO TO PREVENT THE STONE LINING FROM REDUCING THE DITCH'S CROSS-SECTIONAL AREA.

2. **STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SLOPES** -- THE APPLICANT SHALL CONSTRUCT AND STABILIZE STONE-COVERED SLOPES BY NOVEMBER 15. THE APPLICANT SHALL SEED AND MULCH ALL SLOPES TO BE VEGETATED BY SEPTEMBER 1. THE DEPARTMENT SHALL CONSIDER ANY AREA HAVING A GRADE GREATER THAN 15% TO BE A SLOPE. IF THE APPLICANT FAILS TO STABILIZE ANY SLOPE TO BE VEGETATED BY SEPTEMBER 1, THEN THE APPLICANT SHALL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SLOPE FOR LATE FALL AND WINTER.

STABILIZE THE SOIL WITH TEMPORARY VEGETATION AND EROSION CONTROL MATS -- BY SEPTEMBER 1 THE APPLICANT SHALL SEED THE DISTURBED SLOPE WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1,000 SQUARE FEET AND APPLY EROSION CONTROL MATS OVER THE MULCHED SLOPE. THE APPLICANT SHALL MONITOR GROWTH OF THE RYE OVER THE NEXT 30 DAYS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR COVER AT LEAST 75% OF THE DISTURBED SLOPE BY NOVEMBER 1, THEN THE APPLICANT SHALL COVER THE SLOPE WITH A LAYER OF WOODWASTE COMPOST AS DESCRIBED IN ITEM III OF THIS STANDARD OR WITH STONE RIPRAP AS DESCRIBED IN ITEM IV OF THIS STANDARD.

STABILIZE THE SLOPE WITH SOD -- THE APPLICANT SHALL STABILIZE THE DISTURBED SLOPE WITH PROPERLY INSTALLED SOD BY SEPTEMBER 1. PROPER INSTALLATION INCLUDES THE APPLICANT PINNING THE SOD ONTO THE SLOPE WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL. THE APPLICANT SHALL NOT USE LATE-SEASON SOD INSTALLATION TO STABILIZE SLOPES HAVING A GRADE GREATER THAN 33% (3H:1V).

STABILIZE THE SLOPE WITH WOODWASTE COMPOST -- THE APPLICANT SHALL PLACE A SIX-INCH LAYER OF WOODWASTE COMPOST ON THE SLOPE BY NOVEMBER 15. PRIOR TO PLACING THE WOODWASTE COMPOST, THE APPLICANT SHALL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED SLOPE. THE APPLICANT SHALL NOT USE WOODWASTE COMPOST TO STABILIZE SLOPES HAVING GRADES GREATER THAN 50% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE

SLOPE FACE.

STABILIZE THE SLOPE WITH STONE RIPRAP -- THE APPLICANT SHALL PLACE A LAYER OF STONE RIPRAP ON THE SLOPE BY NOVEMBER 15. THE APPLICANT SHALL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE NEEDED FOR STABILITY AND TO DESIGN A FILTER LAYER FOR UNDERNEATH THE RIPRAP.

3. **STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SOILS** -- BY SEPTEMBER 15 THE APPLICANT SHALL SEED AND MULCH ALL DISTURBED SOILS ON AREAS HAVING A SLOPE LESS THAN 15%. IF THE APPLICANT FAILS TO STABILIZE THESE SOILS BY THIS DATE, THEN THE APPLICANT SHALL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SOIL FOR LATE FALL AND WINTER.

STABILIZE THE SOIL WITH TEMPORARY VEGETATION -- BY SEPTEMBER 1 THE APPLICANT SHALL SEED THE DISTURBED SOIL WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET, LIGHTLY MULCH THE SEEDED SOIL WITH HAY OR STRAW AT 75 POUNDS PER 1000 SQUARE FEET, AND ANCHOR THE MULCH WITH PLASTIC NETTING. THE APPLICANT SHALL MONITOR GROWTH OF THE RYE OVER THE NEXT 30 DAYS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR COVER AT LEAST 75% OF THE DISTURBED SOIL BEFORE NOVEMBER 1, THEN THE APPLICANT SHALL MULCH THE AREA FOR OVER-WINTER PROTECTION AS DESCRIBED BELOW.

STABILIZE THE SOIL WITH SOD -- THE APPLICANT SHALL STABILIZE THE DISTURBED SOIL WITH PROPERLY INSTALLED SOD BY SEPTEMBER 15. PROPER INSTALLATION INCLUDES THE APPLICANT PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL.

STABILIZE THE SOIL WITH MULCH -- BY NOVEMBER 15 THE APPLICANT SHALL MULCH THE DISTURBED SOIL BY SPREADING HAY OR STRAW AT A RATE OF AT LEAST 150 POUNDS PER 1000 SQUARE FEET ON THE AREA SO THAT NO SOIL IS VISIBLE THROUGH THE MULCH. PRIOR TO APPLYING THE MULCH, THE APPLICANT SHALL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED AREA. IMMEDIATELY AFTER APPLYING THE MULCH, THE APPLICANT WILL ANCHOR THE MULCH WITH PLASTIC NETTING TO PREVENT WIND FROM MOVING THE MULCH OFF THE DISTURBED SOIL.

TEMPORARY SEEDING PLAN

Project:	Proposed Residential Development		
Site Location:	37 Barra Road, Biddeford, ME		
	Permanent Seeding	X	Temporary Seeding
1.	Instruction on preparation of soil: Prepare a good seed bed for planting method used.		
2.	Apply lime as follows: <u> # </u> / acres, OR <u>138 #</u> /M Sq. Ft.		
3.	Fertilize with <u> </u> pounds of <u> </u> N-P-K/ac. OR <u>13.8</u> pounds of <u>10-10-10</u> N-P-K/M Sq. Ft.		
4.	Method of applying lime and fertilizer: Spread and work into the soil before seeding.		
5.	Seed with the following mixture:		
6.	50% Winter Rye		
	50% Annual Rye		
7.	Mulching instructions:	Apply at the rate of <u> </u> per acre, OR <u>75</u> pounds per M. Sq. Ft.	
		Amount	Unit # Tons, Etc.
8.	TOTAL LIME	138 #/1000 sq. ft.	
9.	TOTAL FERTILIZER	13.8 #/1000 sq. ft.	
10.	TOTAL SEED	1.03 #/1000 sq. ft.	
11.	TOTAL MULCH	75 #/1000 sq. ft.	
12.	TOTAL other materials, seeds, etc.		
13.	REMARKS		

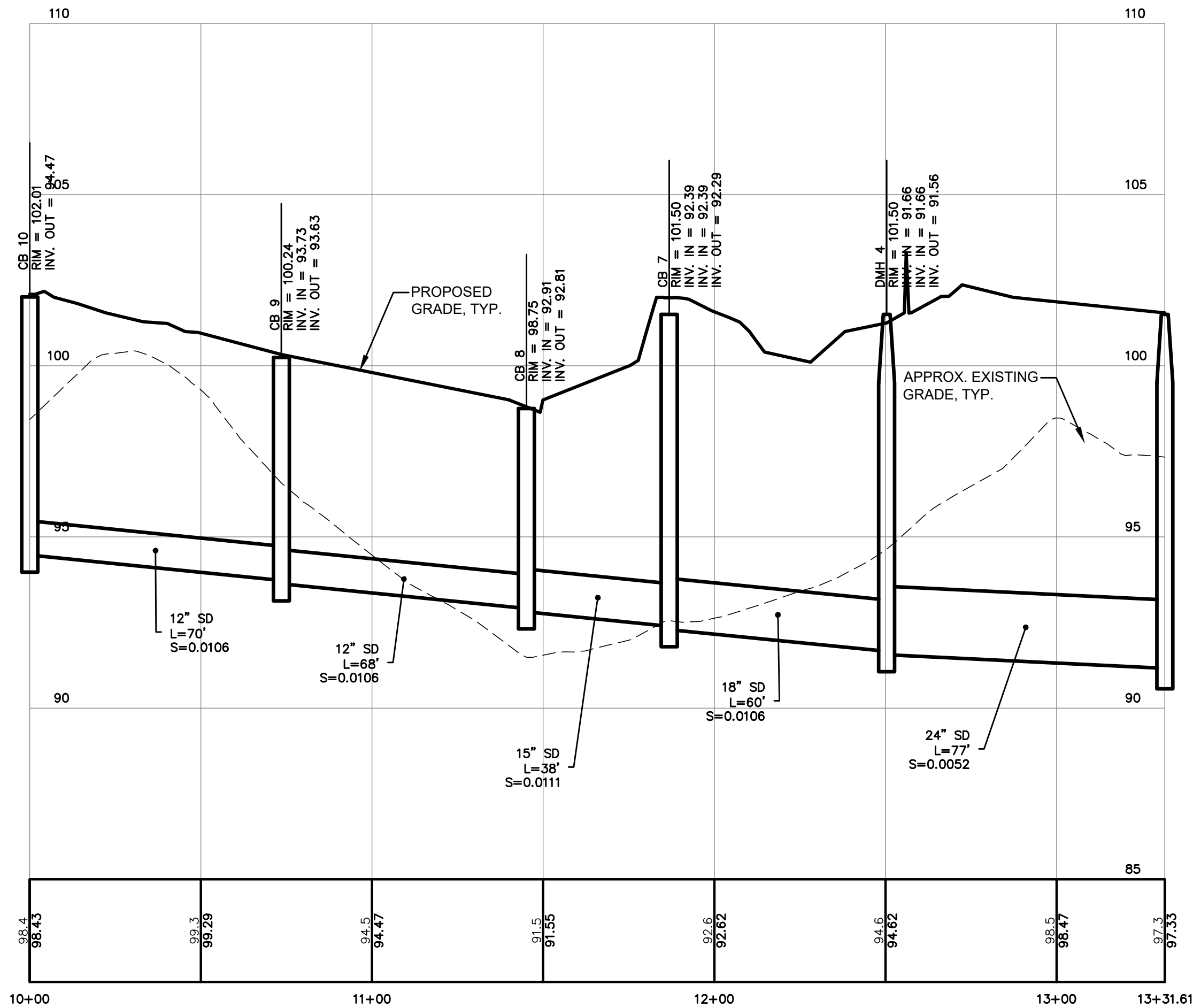
Spring seeding is recommended; however, late summer (prior to September 1) seeding can be made. Permanent seeding should be made prior to August 5 or as a dormant seeding after the first killing frost and before the first snowfall. If seeding cannot be done within these seeding dates, temporary seeding and mulching shall be used to protect the site. Permanent seeding shall be delayed until the next recommended seeding period.

PERMANENT SEEDING PLAN

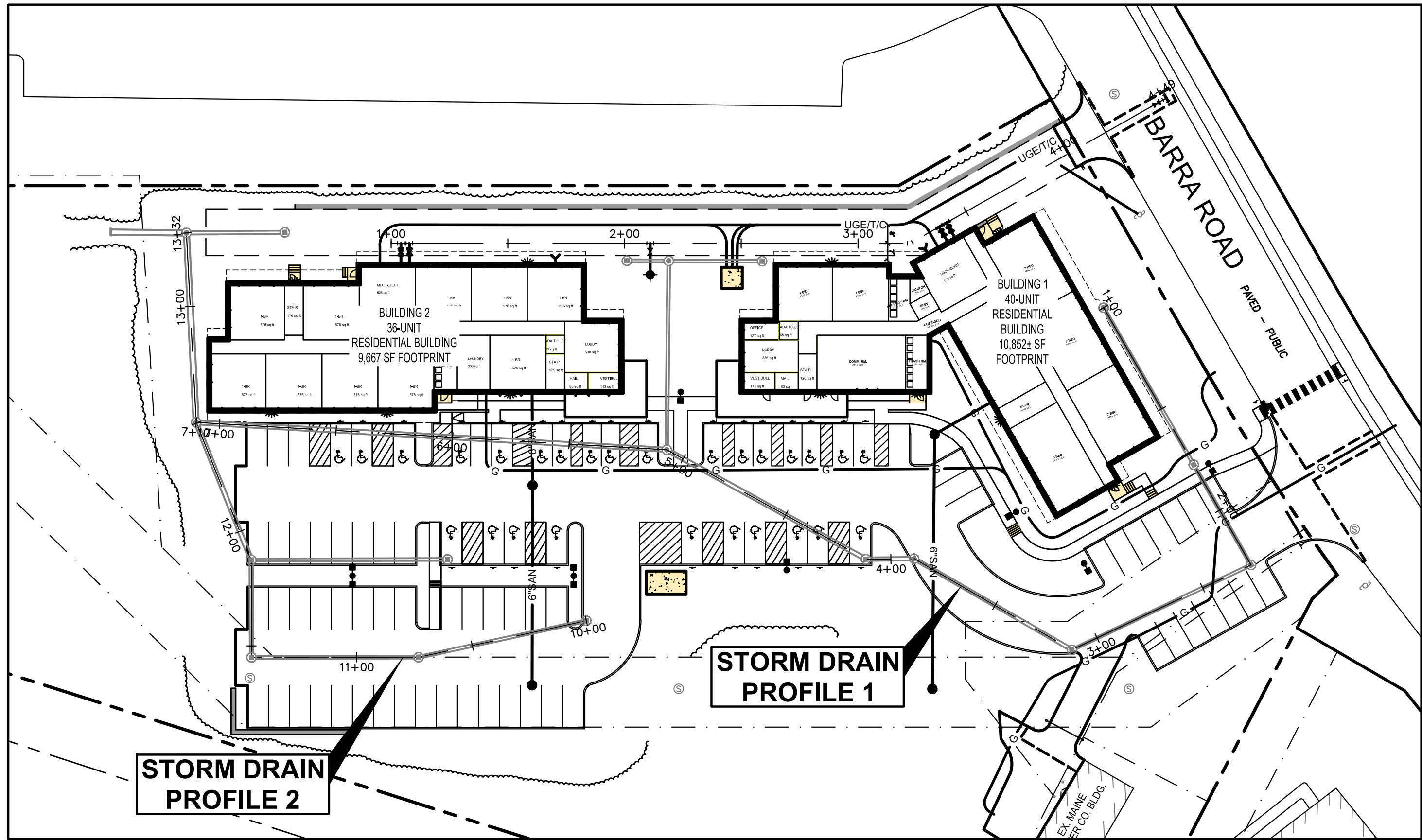
Project:	Proposed Residential Development		
Site Location:	37 Barra Road, Biddeford, ME		
	X	Permanent Seeding	Temporary Seeding
1.	Instruction on preparation of soil: Prepare a good seed bed for planting method used.		
2.	Apply lime as follows: <u> # </u> / acres, OR <u>138 #</u> /M Sq. Ft.		
3.	Fertilize with <u> </u> pounds of <u> </u> N-P-K/ac. OR <u>18.4</u> pounds of <u>10-20-20</u> N-P-K/M Sq. Ft.		
4.	Method of applying lime and fertilizer: Spread and work into the soil before seeding.		
5.	Seed with the following mixture:		
	40% Creeping Red Fescue		
	30% Charger II Perennial Ryegrass		
	20% KenBlue Kentucky Bluegrass		
	10% Tiffany Chewings Fescue		
6.	Mulching instructions:	Apply at the rate of <u> </u> per acre, OR <u>75</u> pounds per M. Sq. Ft.	
		Amount	Unit # Tons, Etc.
7.	TOTAL LIME	138 #/1000 sq. ft.	
8.	TOTAL FERTILIZER	18.4 #/1000 sq. ft.	
9.	TOTAL SEED	1.03 #/1000 sq. ft.	
10.	TOTAL MULCH	75 #/1000 sq. ft.	
11.	TOTAL other materials, seeds, etc.		
12.	REMARKS:		

Spring seeding is recommended, however, late summer (prior to September 1) seeding can be made. Permanent seeding should be made prior to August 5 or as a dormant seeding after the first killing frost and before the first snowfall. If seeding cannot be done within these seeding dates, temporary seeding and mulching shall be used to protect the site. Permanent seeding shall be delayed until the next recommended seeding period.

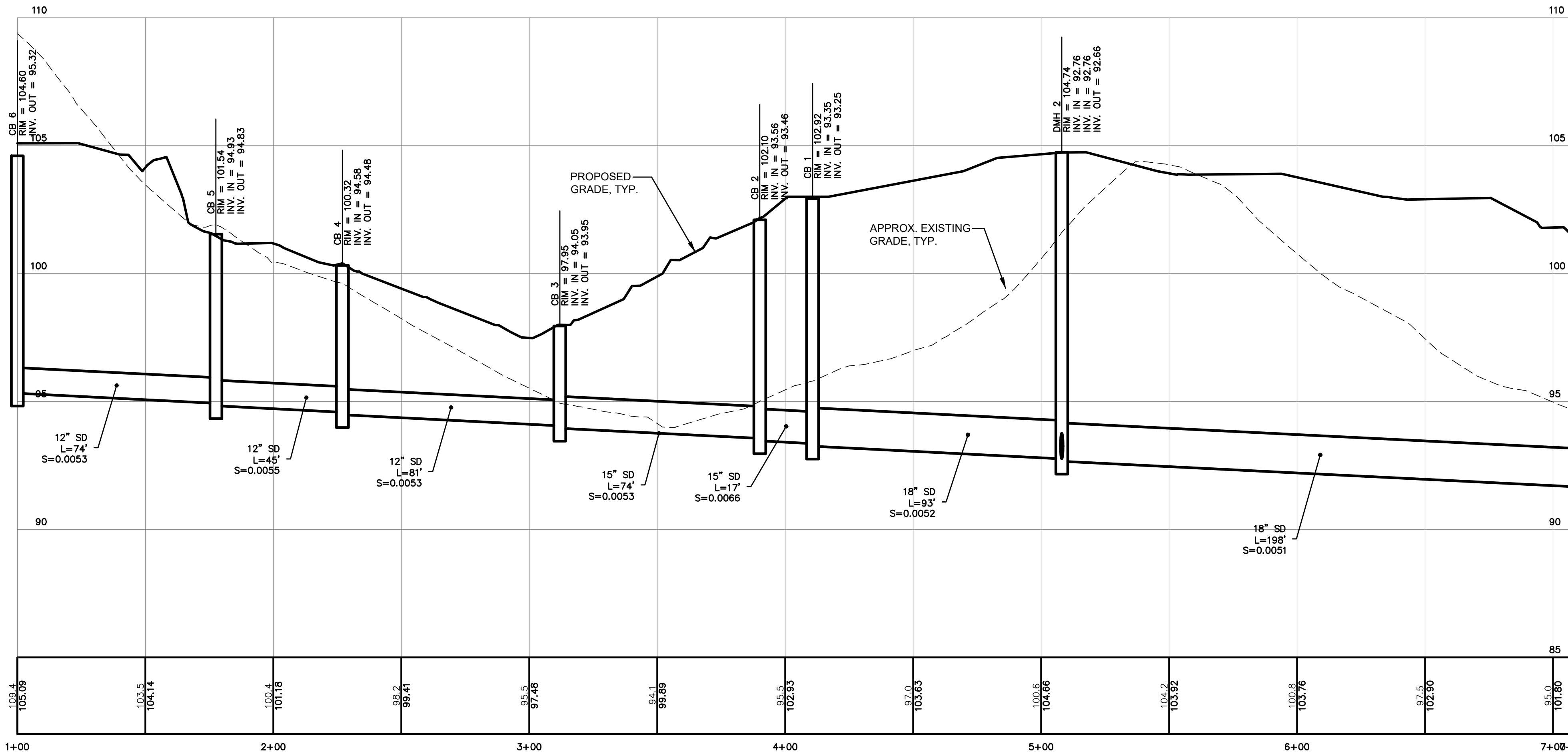
NOTE: THIS PLAN SET IS
ISSUED FOR PERMITTING
PURPOSE



STORM DRAIN PROFILE 2
SCALE: 1" = 30' HORZ / 1" = 3' VERT

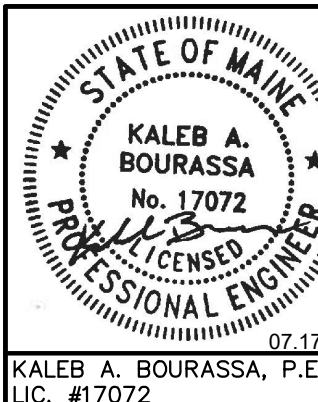


ORIENTATION MAP
SCALE: 1" = 40'



STORM DRAIN PROFILE 1
SCALE: 1" = 30' HORZ / 1" = 3' VERT

NOTE: THIS PLAN SET IS
ISSUED FOR PERMITTING
PURPOSES & SHALL NOT BE
USED FOR CONSTRUCTION.



Rev.	Date	Revision
3	2024.07.17	FINAL PLAN SUBMISSION TO CITY OF BIDDEFORD
2	2024.06.26	PRELIMINARY PLAN SUBMISSION TO CITY OF BIDDEFORD
1	2024.06.18	FOR CLIENT REVIEW

Rev.	Date	Revision

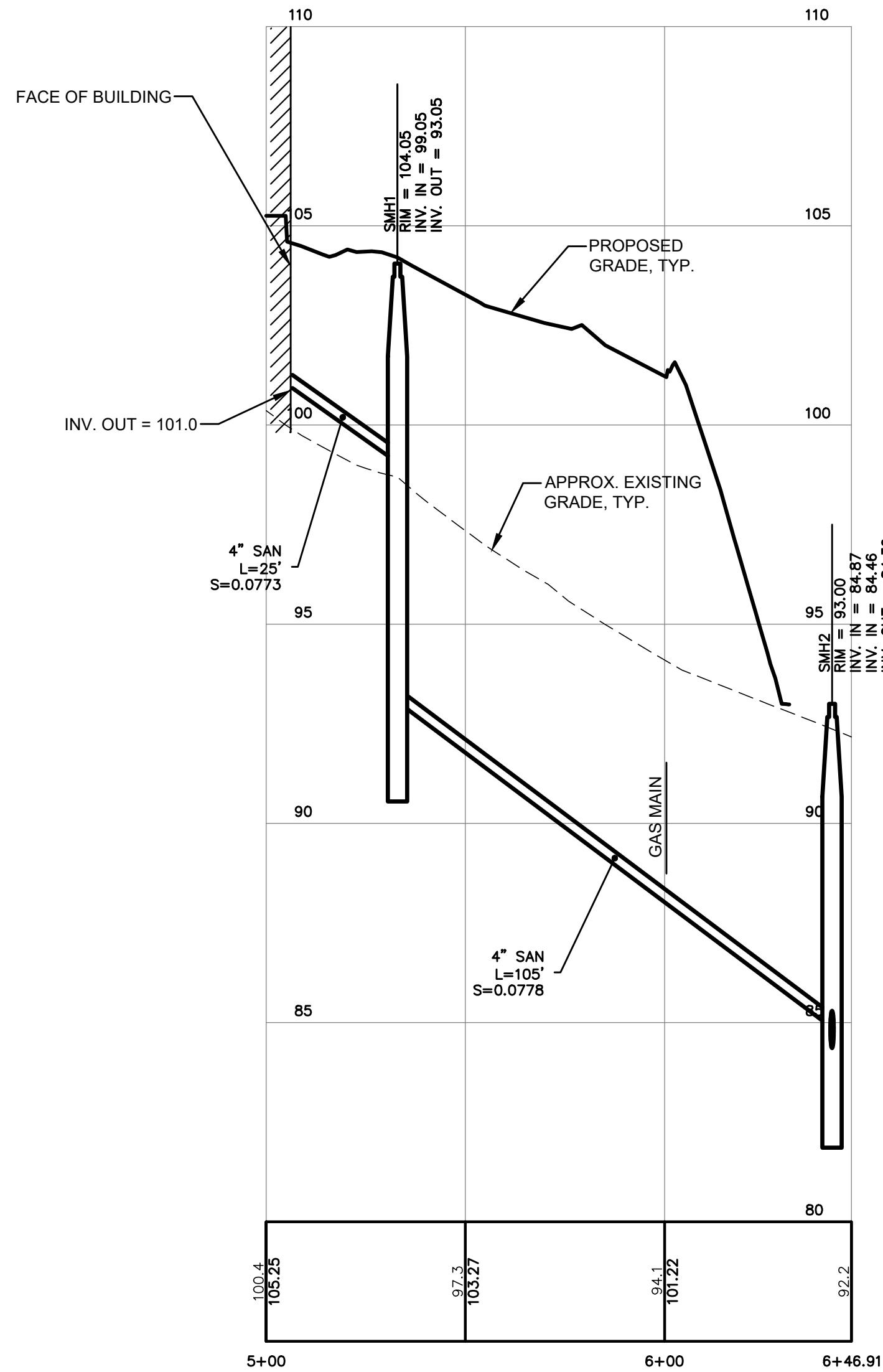
Design: KAB	Draft: CDD	Date: JUNE 2024
Checked: SRB	Scale: AS NOTED	Job No.: 4303
File Name: 4303-UTILITY.dwg		
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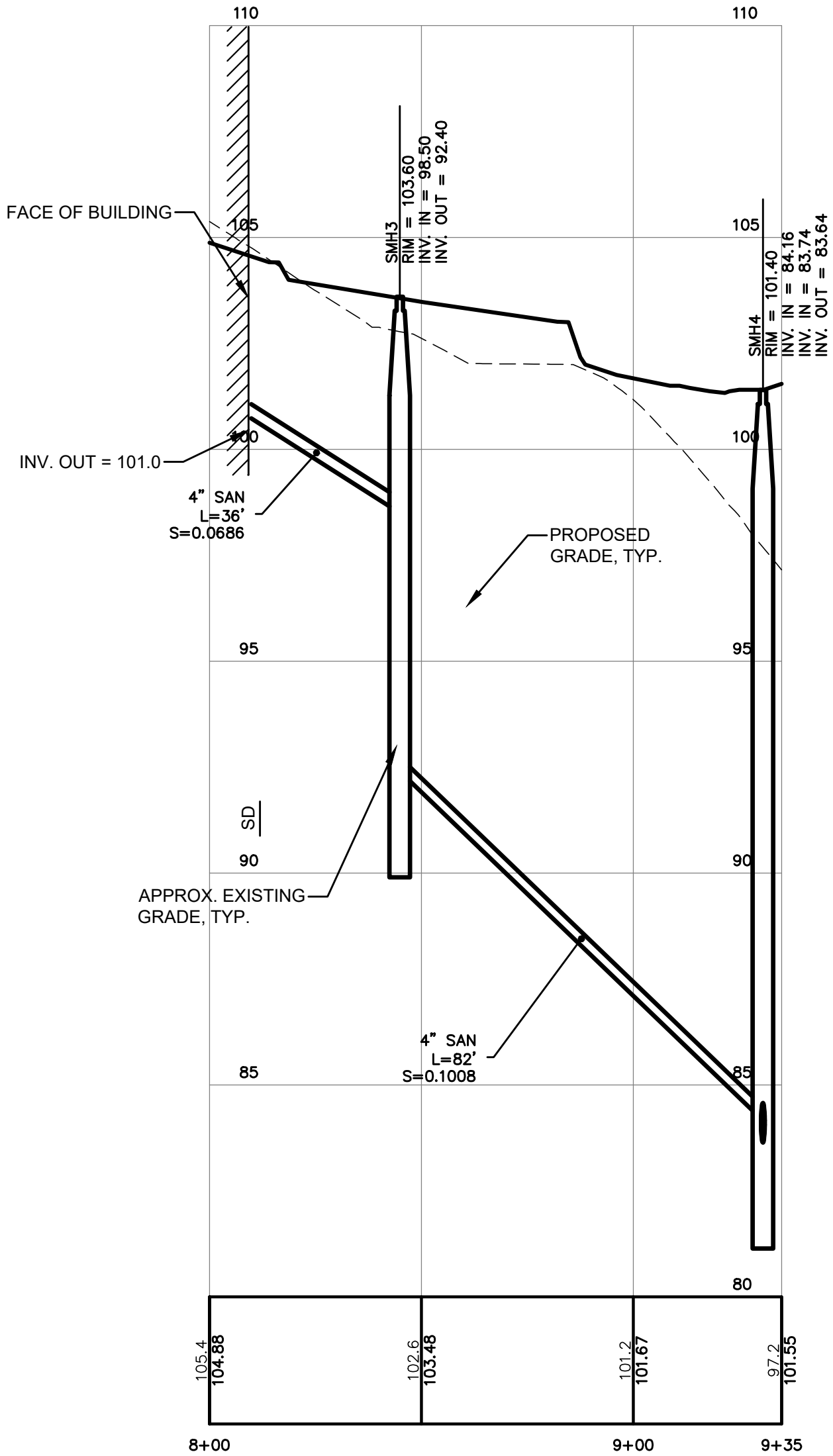
Gorriil Palmer, an LJB Engineering Company
GorriilPalmer.com
(207) 772-2515
300 Southborough Drive - Suite 200
South Portland, ME 04106

Drawing Name:	STORM DRAIN PROFILES
Project:	PROPOSED RESIDENTIAL DEVELOPMENT 37 BARRA ROAD, BIDDEFORD, MAINE
Client:	WESTBROOK DEVELOPMENT CORPORATION 30 LIZA HARMON DRIVE, WESTBROOK, ME 04092

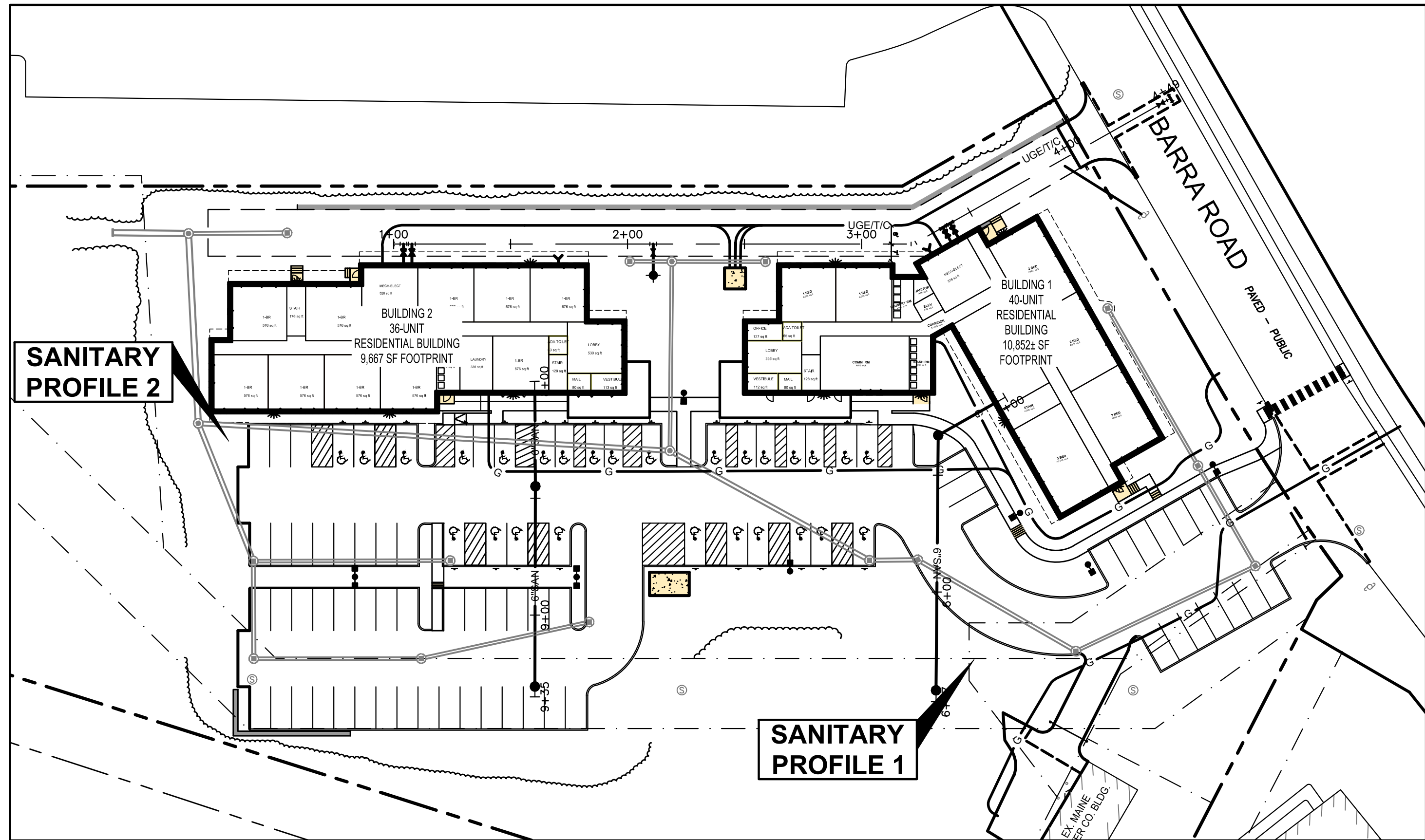
Drawing No.
C-8.0



SANITARY PROFILE 1
SCALE: 1" = 30' HORZ / 1" = 3' VERT

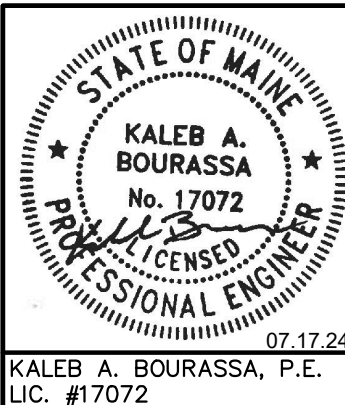


SANITARY PROFILE 2
SCALE: 1" = 30' HORZ / 1" = 3' VERT



ORIENTATION MAP
SCALE: 1" = 40'

NOTE: THIS PLAN SET IS
ISSUED FOR PERMITTING
PURPOSES & SHALL NOT BE
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KALEB A. BOURASSA, P.E.
LIC. #17072

Rev.	Date	Revision

Rev.	Date	Revision
3	2024.07.17	FINAL PLAN SUBMISSION TO CITY OF BIDDEFORD
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1	2024.06.18	FOR CLIENT REVIEW

Design: KAB	Draft: CDD	Date: JUNE 2024
Checked: SRB	Scale: AS NOTED	Job No.: 4303
File Name: 4303-UTILITY.dwg		
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(207) 772-2515
300 Southborough Drive - Suite 200
South Portland, ME 04106

Drawing Name:	UTILITY PROFILES
Project:	PROPOSED RESIDENTIAL DEVELOPMENT 37 BARRA ROAD, BIDDEFORD, MAINE
Client:	WESTBROOK DEVELOPMENT CORPORATION 30 LIZA HARMON DRIVE, WESTBROOK, ME 04092

Drawing No.
C-8.1

NOTE: This drawing is PRELIMINARY ONLY. It is NOT intended for use as a construction document.

Prepared for:
Westbrook Development Corporation,
Thatcher Brook Apartments I, LP, &
Thatcher Brook Apartments II, LP
30 Liza Harmon Drive
Westbrook, ME 04092

Prepared By:
dry landscape architecture, l.l.c
31 miller ave.
Biddeford, ME 04005

Date:
JULY 17, 2024

Issued For:
PLANNING BOARD REVIEW

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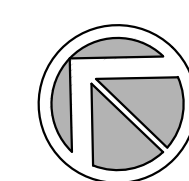
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PROPOSED
RESIDENTIAL
REDEVELOPMENT
37 BARRA RD,
BIDDEFORD, ME

Revisions:



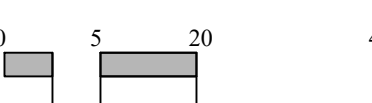
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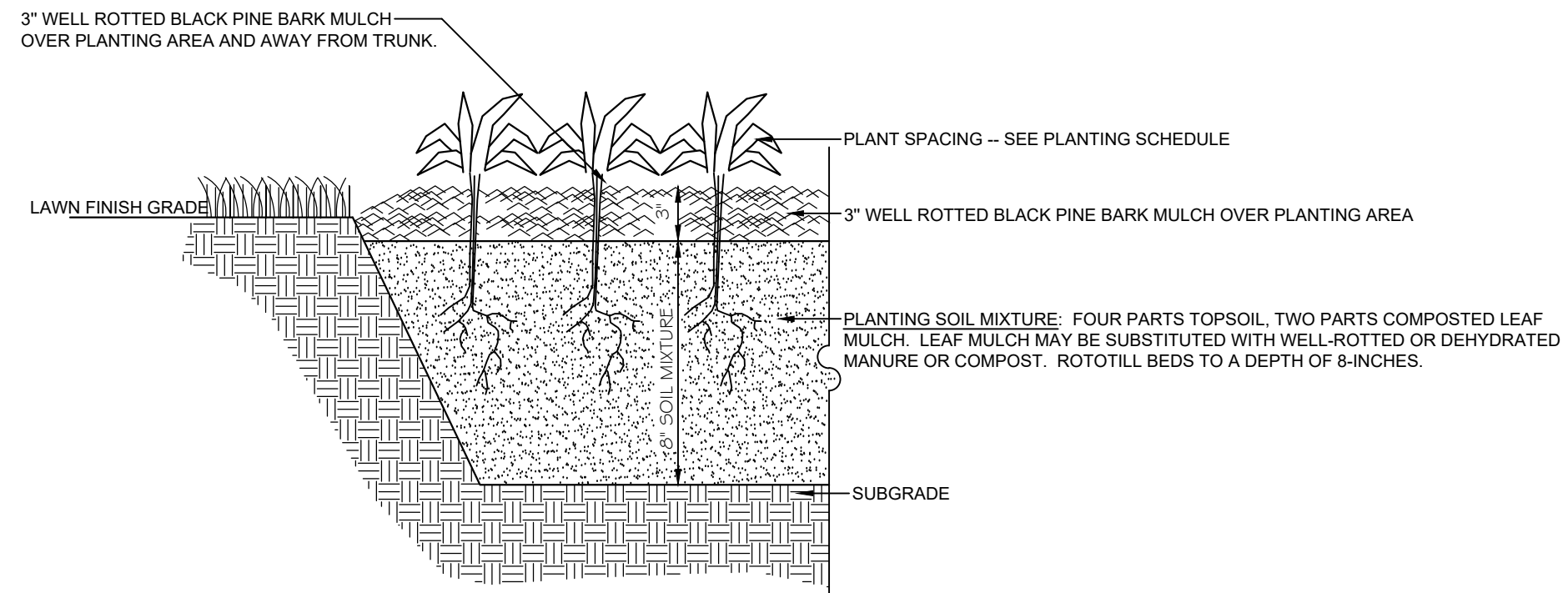
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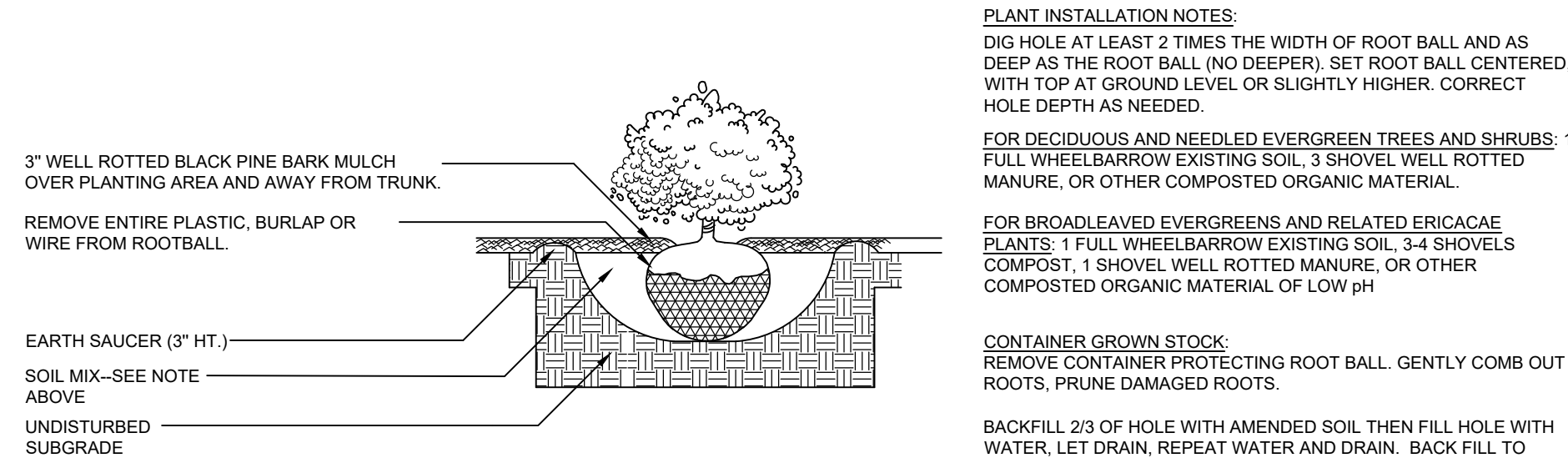
Page 674 of 807

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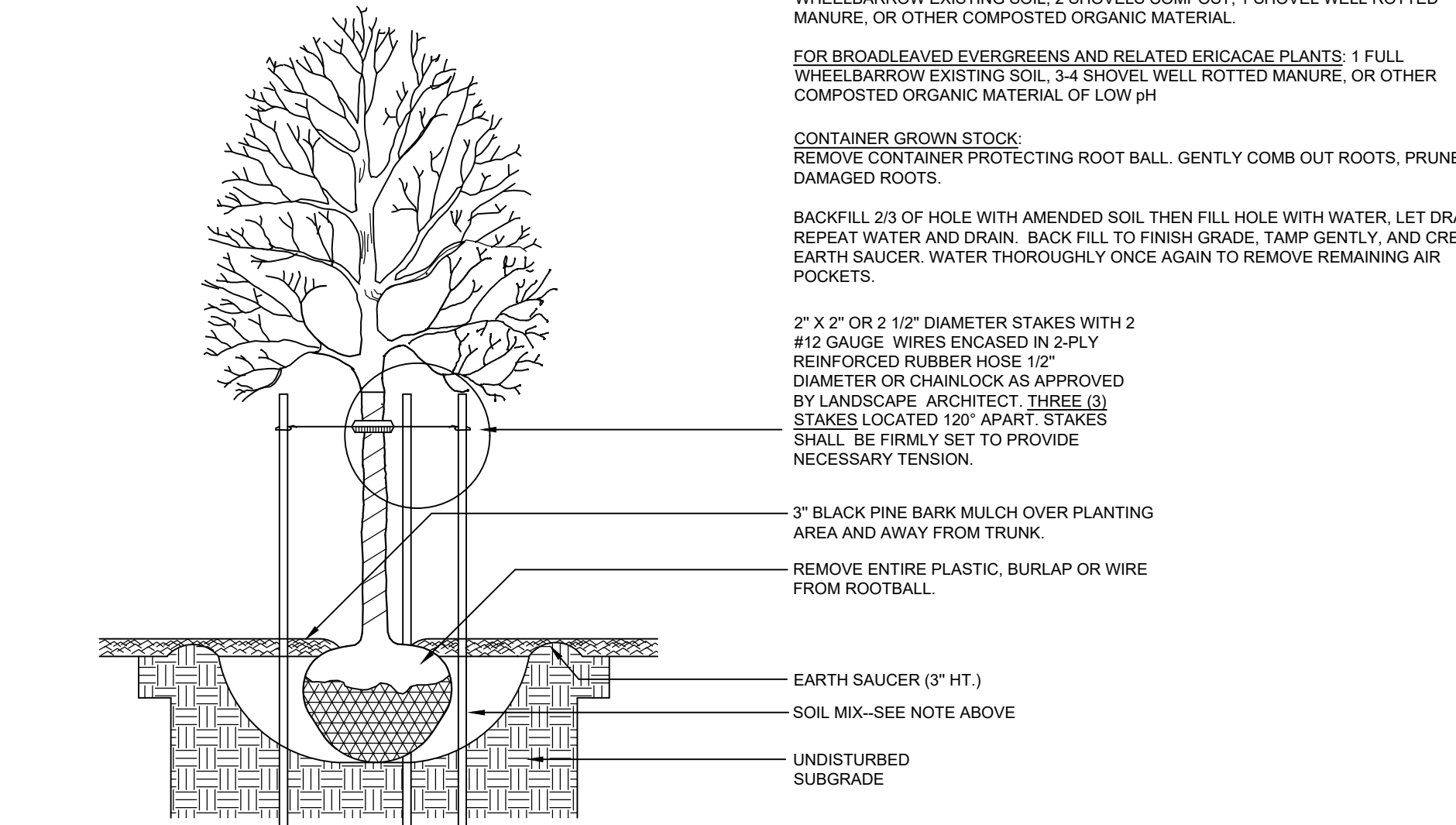
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SCALE: N.T.S.



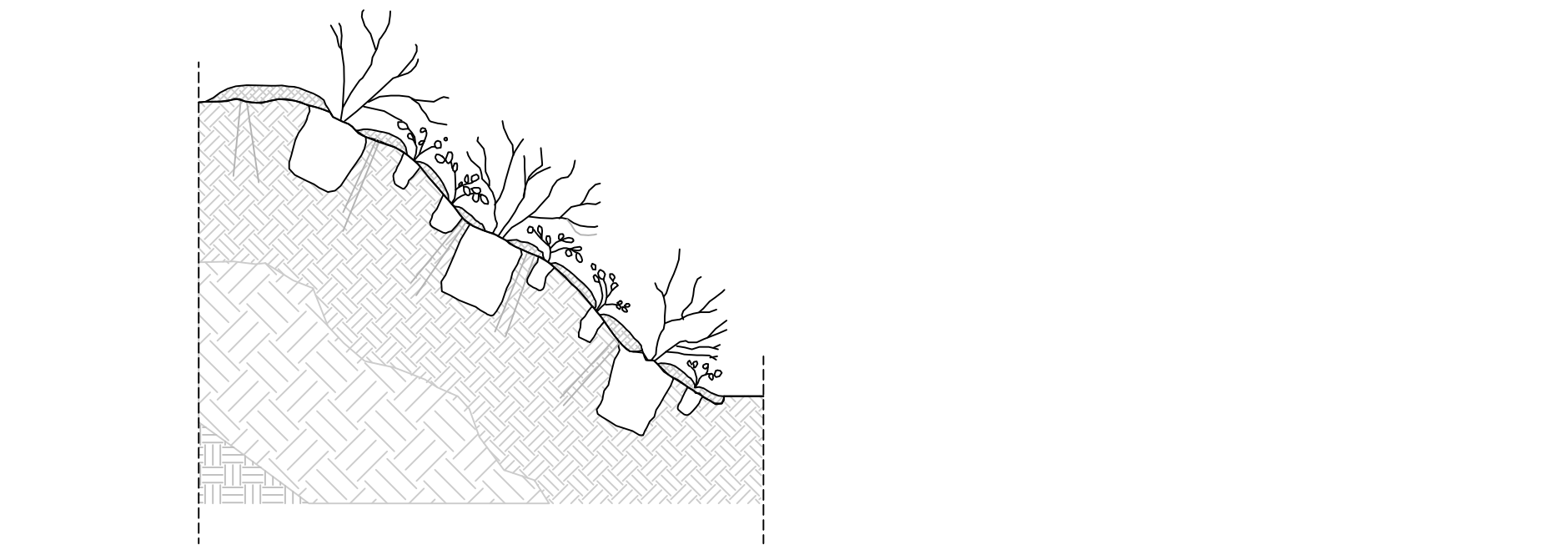
02 SHRUB INSTALLATION

SCALE: N.T.S.



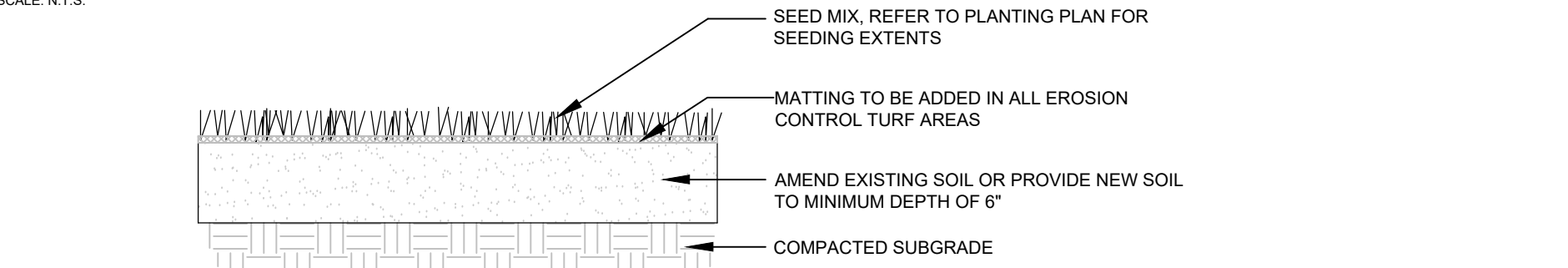
03 DECIDUOUS TREE DETAIL

SCALE: N.T.S.



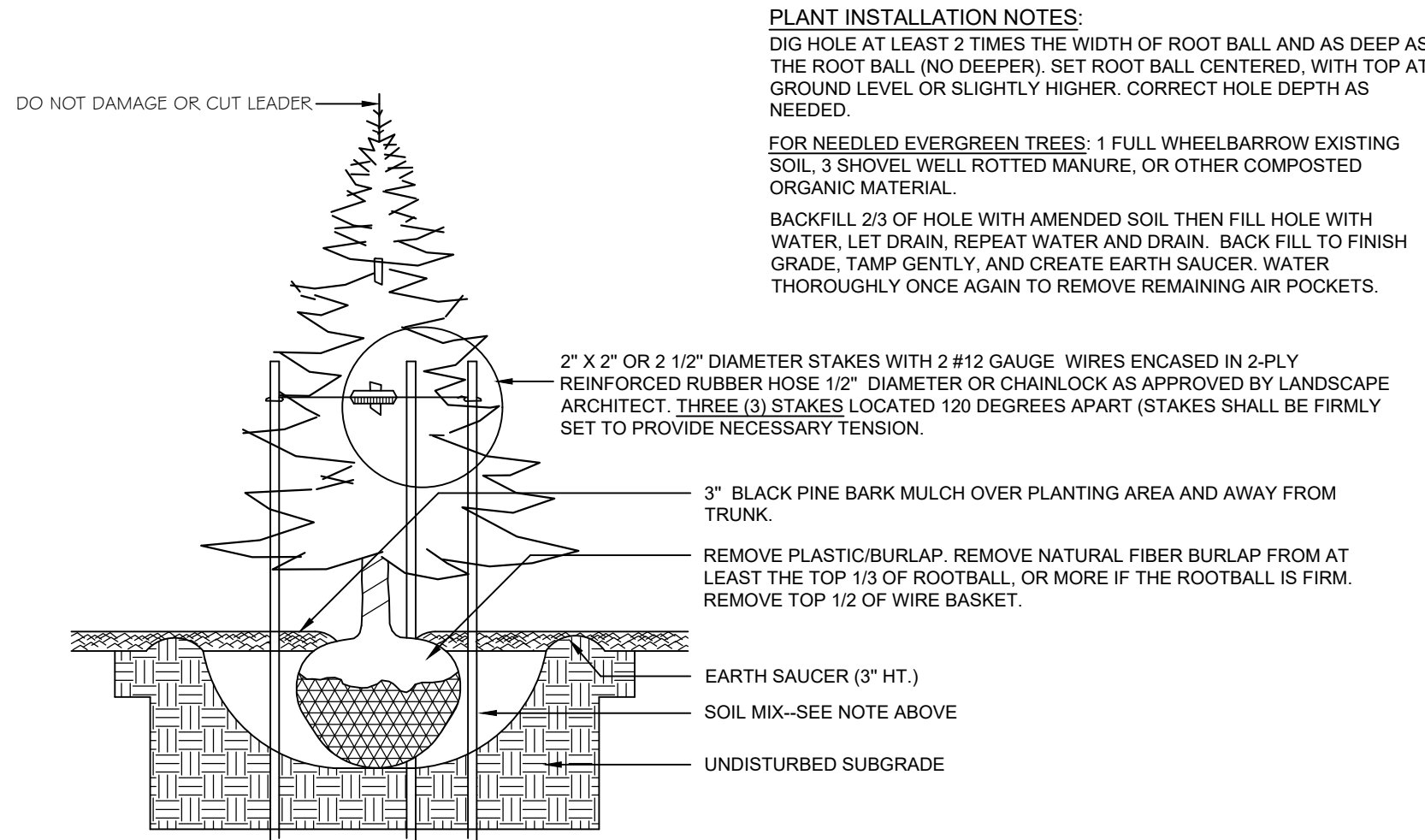
04 SLOPE PLANTING DETAIL

SCALE: N.T.S.



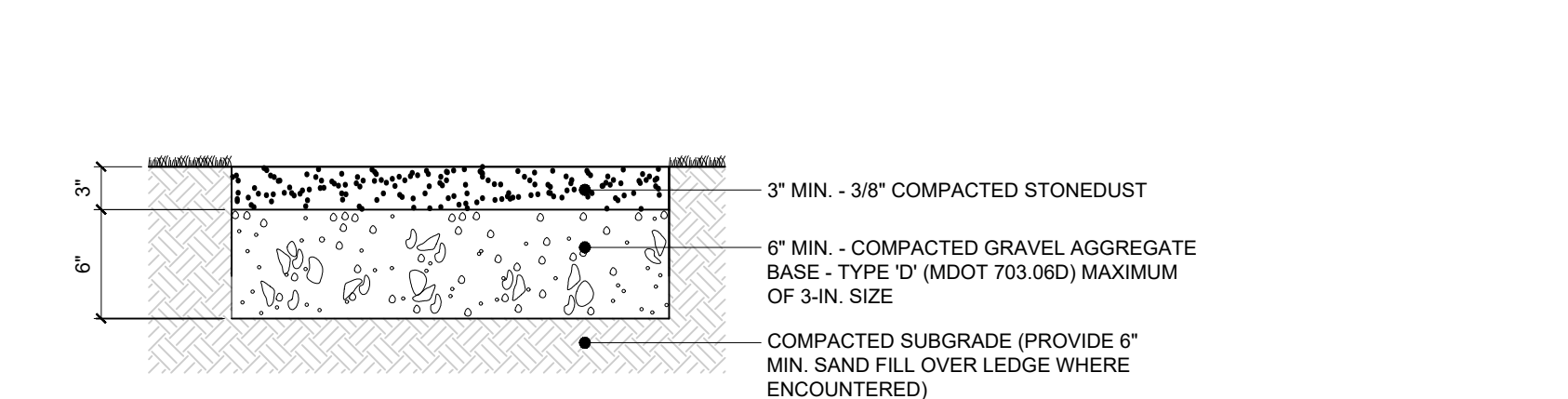
05 LAWN DETAIL

SCALE: N.T.S.



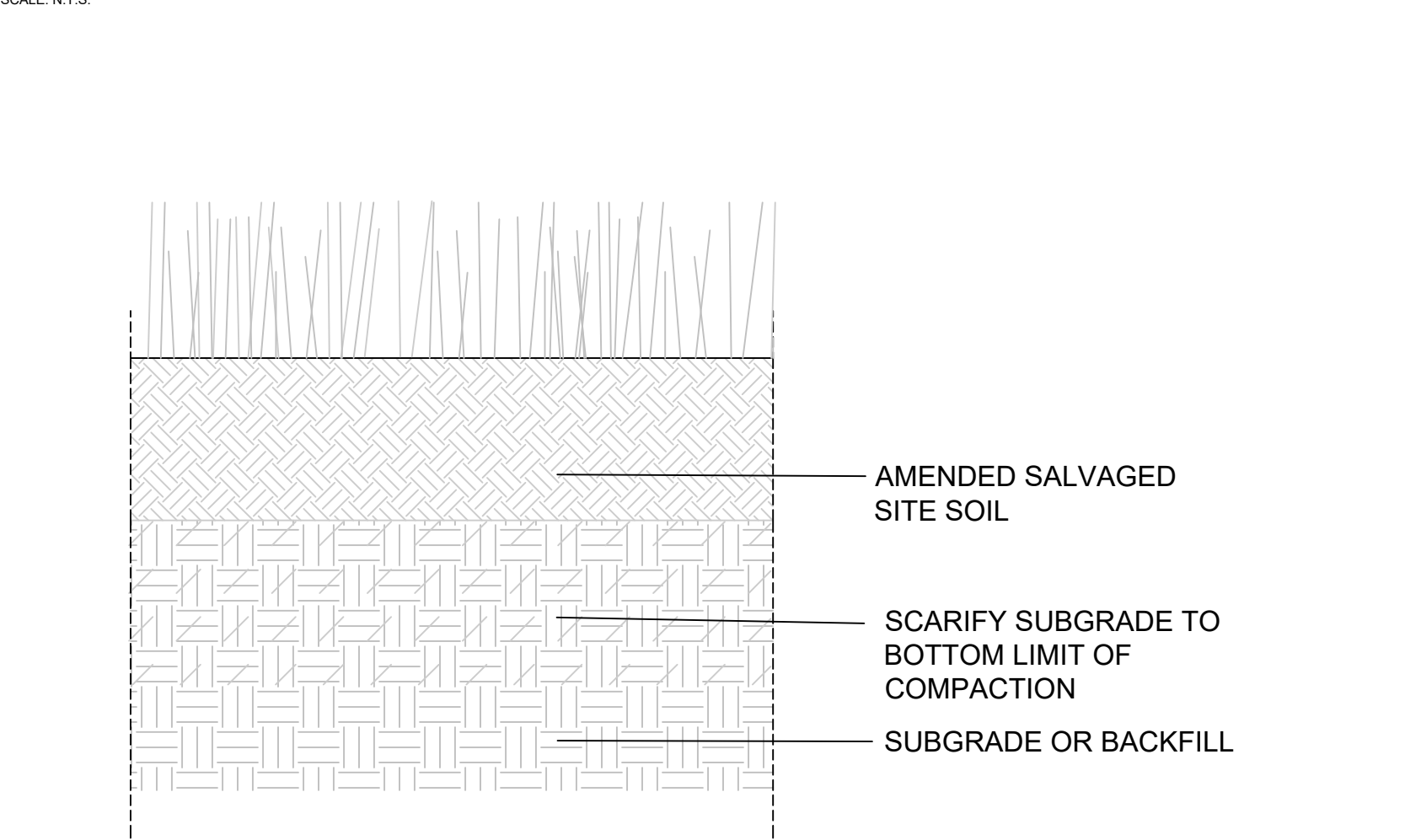
06 CONIFEROUS TREE DETAIL

SCALE: N.T.S.



07 STABILIZED STONEDUST

SCALE: N.T.S.



08 CONSERVATION MIX SOIL PROFILE

SCALE: N.T.S.

PLANT SCHEDULE

DECIDUOUS TREES						
CODE	BOTANICAL NAME	COMMON NAME	QTY.	SIZE	SPACING	NOTES
AM	<i>Amelanchier laevis</i>	Allegheny Serviceberry	1	10-12'	as shown	Single Stem, Matched
AFA	<i>Acer freemanii 'Autumn Blaze'</i>	Autumn Blaze Maple	1	3" cal	as shown	Single Stem, Matched
CC	<i>Cercis canadensis</i>	Eastern Redbud	1	12-14'	as shown	Multi-stem, B&B
CA	<i>Cornus alternifolia</i>	Pagoda Dogwood	2	10-12'	as shown	Multi-stem, B&B
LL	<i>Larix laricina</i>	Tamarack	1	10-12'	as shown	Single Stem
LS	<i>Liquidambar styraciflua 'Slender Silhouette'</i>	Liquidambar styraciflua 'Slender Silhouette'	1	3" cal	as shown	Single Stem, B&B
PA	<i>Prunus 'Accolade'</i>	Accolade Cherry	6			
PO	<i>Platanus x acerifolia 'Exclamation'</i>	Exclamation Planetree	2	3" cal	as shown	Single Stem, B&B
QB	<i>Quercus bicolor</i>	Swamp White Oak	5	3" cal	as shown	Single Stem, Matched
UA	<i>Ulmus 'Accolade'</i>	Accolade Elm	3	3" cal	as shown	Single Stem, Matched

EVERGREEN TREES						
CODE	BOTANICAL NAME	COMMON NAME	QTY.	SIZE	SPACING	NOTES
PR	<i>Pinus rigida</i>	Pitch Pine	6	10-12'	as shown	
SAPLING MATRIX						
CODE	BOTANICAL NAME	COMMON NAME	QTY.	SIZE	SPACING	NOTES
	<i>Betula populifolia</i> 'Whitespire'	Whitespire Grey Birch	6	SAPLING	as shown	
	<i>Juniperus virginiana</i> 'Hillspire'	Hillspire Eastern Red Cedar	3	2-3'	as shown	
	<i>Populus deltoides</i>	Eastern Cottonwood	6	SAPLING	as shown	
	<i>Rhus typhina</i>	Staghorn Sumac	6	SAPLING	as shown	

DECIDUOUS SHRUBS						
CODE	BOTANICAL NAME	COMMON NAME	QTY.	SIZE	SPACING	NOTES
CAS	<i>Clethra alnifolia 'Sixteen Candles'</i>	Sixteen Candles Summersweet	3	18"-24" ht.	30" O.C.	
CAB	<i>Cornus alba 'Bud's Yellow'</i>	Bud's Yellow Dogwood	2	24"-38" ht.	60" O.C.	
CA	<i>Ceanothus americanus</i>	New Jersey Tea	TBD	#1 CONT.	24" OC	Plant A Mix (Wildflower Matrix)
HYA	<i>Hydrangea arborescens 'Annabelle'</i>	Annabelle Smooth Hydrangea	2	3'-4' ht.	36" O.C.	
HYE	<i>Hydrangea Endless Summer 'Blushing Bride'</i>	Blushing Bride Hydrangea	8	30"-36" ht.	36" O.C.	
HH	<i>Hypericum 'Hidcote'</i>	St. John's Wort	9	24"-36" ht.	36" O.C.	
MPN	<i>Myrica pensylvanica</i>	Northern Bayberry	4	24"-30" ht.	AS SHOWN	
RA	<i>Rhus aromatica 'Gro-Low'</i>	Gro-Low Fragrant Sumac	32	#3/ 18"-24" ht.	60" O.C.	

EVERGREEN SHRUBS						
CODE	BOTANICAL NAME	COMMON NAME	QTY.	SIZE	SPACING	NOTES
IXE	<i>Ilex glabra</i> 'Gem Box'	Gem Box Inkberry	tbd	24"-30" ht.	24" O.C.	
IXSH	<i>Ilex glabra</i> 'Shamrock'	Shamrock Inkberry	12	30"-36" ht.	36" O.C.	
JUC	<i>Juniperus conferta</i> 'Emerald Sea'	Emerald Sea Shore Juniper	4	18"-24" ht.	36" O.C.	

GRONDCOVER MIX						
	BOTANICAL NAME	COMMON NAME	QTY.	SIZE	SPACING	NOTES
AV	<i>Anemone virginiana</i>	Tall Thimbleweed	TBD	plug	15" OC	straight native species preferred
AC	<i>Aster cordifolius</i>	Blue Woodland Aster	TBD	plug	15" OC	straight native species preferred
AU	<i>Arctostaphylos uva-ursi</i>	Bearberry	TBD	#2 CONT	24" O.C.	
GRC	<i>Geranium x 'Rozanne'</i>	Rozanne Cranesbill	TBD	#2 CONT	24" O.C.	Shade Plant Matrix
GT	<i>Gillenia trifoliata</i>	Boman's Root	TBD	#1 CONT	24" OC	" "
RA	<i>Rhus aromatica 'Gro-low'</i>	Fragrant Sumac 'Gro-low'	TBD	#2 CONT	36" OC	
SEC	<i>Sedum coral carpet</i>	Coral Carpet Sedum	TBD	#1 CONT	18" O.C.	
XS	<i>Xanthoriza simplicissima</i>	Yellowroot	TBD	#1 CONT	42" OC	Shade Plant Matrix

PERENNIAL & GRASSES						
CODE	BOTANICAL NAME	COMMON NAME	QTY.	SIZE	SPACING	NOTES
AMH	<i>Artemisia ludovicis</i>	Thread-leaved Bluestar	TBD	#1 CONT	24" O.C.	Plant A Mix (Wildflower Matrix)
AHY	<i>Asclepias 'Hello Yellow'</i>	Butterfly Weed	TBD	#1 CONT	18" O.C.	Plant A Mix (Wildflower Matrix)
ABB	<i>Astilbe 'Bressingham Beauty'</i>	Bressingham Beauty Astilbe	TBD	#1 CONT	18" O.C.	Shade Plant Matrix
ASH	<i>Astilbe 'Milk and Honey'</i>	Milk & Honey Astilbe	TBD	#1 CONT	24" O.C.	Shade Plant Matrix
BG	<i>Bouteloua gracilis 'Blonde Ambition'</i>	Side Oats Grama	TBD	#2 CONT	24" O.C.	Plant A Mix (Wildflower Matrix)
CHLA	<i>Chasmanthium latifolium</i>	Northern Sea Oats	TBD	#2 CONT	30" O.C.	Plant A Mix (Wildflower Matrix)
COM	<i>Coreopsis 'Moonbeam'</i>	Moonbeam Coreopsis	TBD	#1CONT	18" O.C.	Plant A Mix (Wildflower Matrix)
DEC	<i>Deschampsia cespitosa'pae fountain'</i>	Tufted Hair Grass	TBD	#2 CONT	24" O.C.	Plant A Mix (Wildflower Matrix)
DEP	<i>Dennistae-dia punctilobula</i>	Hay Scented Fern	TBD	#1 CONT	30" O.C.	Plant A Mix (Wildflower Matrix)
EPC	<i>Echinacea purpurea</i>	Purple Coneflower	TBD	#2 CONT	24" O.C.	Plant A Mix (Wildflower Matrix)
HKK	<i>Hemerocallis 'Kansas Kitten'</i>	Kansas Kitten Daylily	TBD	#2 CONT	18" O.C.	
HSO	<i>Hemerocallis 'Sella d'Oro'</i>	Sella d'Oro Daylily	TBD	#2 CONT	18" O.C.	
HAH	<i>Hemerocallis 'Heavenly Angel Ice'</i>	Heavenly Angel Ice Daylily	TBD	#2 CONT	24" O.C.	
LS	<i>Liatris spicata</i>	Gayfeather	TBD	#2 CONT.	30" OC	Plant A Mix (Wildflower Matrix)
M	<i>Monarda spp.</i>	Beebalm	TBD	#2 CONT.	30" OC	Plant A Mix (Wildflower Matrix)
PV	<i>Panicum virgatum 'Shenandoah'</i>	Shenandoah Switchgrass	TBD	#2 CONT	24" O.C.	
RFA	<i>Rudbeckia fulgida 'American Gold Rush'</i>	Gold Rush Black-Eyed Susan	TBD	#2 CONT	24" O.C.	Plant A Mix (Wildflower Matrix)
SS	<i>Schizachyrium scoparium</i>	Little Bluestem	TBD	#1 CONT	24" O.C.	Plant A Mix (Wildflower Matrix)
SMM	<i>Salvia 'May Night'</i>	May Night Salvia	TBD	#2 CONT	24" O.C.	

VINES						
CODE	BOTANICAL NAME	COMMON NAME	QTY.	SIZE	SPACING	NOTES
	<i>Hydrangea anomala</i>	Climbing Hydrangea	16	24" ht.	As shown	#3 Cont.
	<i>Parthenocissus quinquefolia 'Traki'</i>	Virginia Creeper	16	24" ht.	As shown	#3 Cont.

Prepared for:
Westbrook Development Corporation,
Thatcher Brook Apartments I, LP, &
Thatcher Brook Apartments II, LP
30 Liza Harmon Drive
Westbrook, ME 04092

Prepared By:
dry landscape architecture, LLC
31 miller ave.
Biddeford, ME 04005

Date:
JULY 17, 2024

Issued For:
PLANNING BOARD REVIEW

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Title: LANDSCAPE DETAILS

PROPOSED
RESIDENTIAL
REDEVELOPMENT
37 BARRA RD,
BIDDEFORD, ME

Revisions:



North:

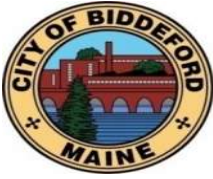
Sheet No.:

L2

Scale:

AS NOTED

ATTACHMENT A

**City of Biddeford – Planning Department****Planning Board Application**

P.O. Box 586, 205 Main Street Biddeford, Maine 04005
207-284-9115

Type of Application:

☐ Shoreland Zoning Permit ☒ Site Plan Review ☐ Extraction
☐ Conditional Use Permit ☒ Subdivision ☐ Private Way
☐ Other: _____

Applicant Information:

Westbrook Development Corporation, Thatcher
 Name: Brook Apartments I, LP, and Thatcher Brook Apartments II, LP
 Mailing Address: 30 Liza Harmon Drive, Westbrook ME 04092
 Telephone: 207.956.1575
 Email: _____

What is your legal interest in the property?

☐ Owner ☒ Potential Buyer with Contract ☐ Lease/Rental Agreement

Owner's Information:

Name: City of Biddeford
 Mailing Address: 205 Main Street, Biddeford, ME 04005
 Telephone: 207.571.0700
 Email: _____

Agent's Information:

Name: Gorrill Palmer
 Mailing Address: 300 Southborough Dr Suite 200, South Portland, ME 04106
 Telephone: 207.772.2515
 Email: kbourassa@gorrillpalmer.com

Engineer/Surveyor's Information:

Name: Gorrill Palmer
 Mailing Address: 300 Southborough Dr Suite 200, South Portland, ME 04106
 Telephone: 207.772.2515
 Email: kbourassa@gorrillpalmer.com

Project Location and Lot Information:

Street Address: 37 Barra Road Drainage Watershed: Thatcher Brook
 Tax Map: 2 Lot: 42
 Current Zoning: I3 Shoreland Zoning: NO
 Size of Lot: 3.65 (X)acres ()s.f. Lot Frontage: 238.17 ft
 Existing Use of Property: Vacant, Pump Station located within 60' x 60' utility easement

Property currently serviced by:

☒ City Road ☐ Public Sewer ☐ Public Water ☐ Public Trash
☐ Private Road ☐ Septic System ☐ Private Well ☐ Private Hauler

Slope Conditions in Area of Construction (if applicable):

☐ Flat (0-3% slope) ☐ Rolling (3-8% slope) ☒ Hilly (8-15% slope) ☐ Steep (15%+ Slope)

Are there any wetlands or waterbodies on the site? ☒ (Yes) ☐ (No) if yes attach information

Is the project within the 100-year floodplain? ☐ (Yes) ☒ (No) if yes attach information

Do you plan to bring fill onto the lot? ☒ (Yes) ☐ (No) If yes attach information

Description of proposed use of property:

Project/Proposed Use:

76-unit multi-family residential development - see attached narrative

Property to be Serviced by:

☒ City Road ☒ Public Sewer ☒ Public Water ☐ Public Trash
☐ Private Road ☐ Septic System ☐ Private Well ☒ Private Hauler

Limits of Disturbance: 104,128 () acres (X)s.f.

Net change in impervious cover: 66,713 () acres (X)s.f.

Is this project part of a larger project? ☐ (Yes) ☒ (No)

Is the project proposing a new Private or Public Road? ☐ (Yes, Private) ☐ (Yes, Public) ☒ (No)

Is this project within the Urbanized Area/MS4 (see [City Drainage Map](#)) ☐ (Yes) ☒ (No)

Is the project proposing any Stormwater facilities/BMPs? ☒ (Yes) ☐ (No)

Will a Traffic Movement Permit (TMP) be required?: ☐ (Yes) ☒ (No)

If in a Shoreland Zone:

Percent of residential lot coverage (Max 20%): _____

Percent of structure expansion (Max 30%): _____

If Subdivision Review, number of lots proposed: _____

If a Private Way is proposed, number of lots served: _____

If Site Plan Review, you must provide the following information:

Total new square feet footprint of structure: 20,519 SF

Total new square feet paving/parking: 41,760 SF

Waiver Requests (attach details):

1. _____
2. _____
3. _____
4. _____
5. _____

Required Submittal Attachments:

A. Letters of Approval

☐ Fire Department – Contact Chief or Deputy Chief – 282-9986

☒ Ability to Serve for Water Service – Maine Water – 282-1543

☒ Ability to Serve for Sewer Service – Engineering Department – Tom Milligan 284-9118

☐ Police Department – e-911 Road Name Designation – Contact Joanne Fisk 282-5127

B. Letter to Planning Board describing project, Waiver requests, proposed improvements, addressing permit requirements, etc.

C. Photographs of Site.

D. Architectural renderings/drawings of proposed buildings, as required.

E. Engineering Plans, as required.

F. Stormwater Management Report, as required.

Fees (Due at time of Submission):

- \$75 Nonrefundable Administration Fee is required for every application.
- Refer to “Attachment A Fees and Charges” of the Land Development Regulations for more information. Consult with Planning Staff if you have questions.

Required Signatures:

By signing this application, as the foresaid applicant or authorized agent:

- I certify that I have read and completely understand the application;
- I certify that the information contained in this application and its attachments are true and correct;
- I understand that all information provided on this form and all other documents submitted as part of my proposal is a matter of public record;
- I understand that copies of this information may be supplied upon request to an interested party.
- I understand that additional funds may be required through the course of the review for special studies, legal review costs, and/or engineering review.
- I understand that by submitting an application I am not guaranteed a place on any particular agenda. I further understand that the City Planner will place me on an agenda for review when the application is deemed substantially complete.

Will the proposed project cause 1 acre or more of site disturbance?: __ (Yes) __ (No)

- **If Yes, applicant is responsible for any required Maine Construction General Permits and shall comply with the requirements of DEP Chapter 500 Stormwater Regulations, as they apply.**

Signature of Applicant: Tyler Norod Date 07/17/2024
Agent
Signature of ~~Property Owner~~: KLB Date 07/17/2024

DIGITAL SUBMITTAL REQUIREMENTS FOR ALL SUBMITTALS:

- A) PDF OF SIGNED APPLICATION
- B) PDFs OF ALL DRAWING SETS AND OTHER REQUIRED SUBMITTAL ATTACHMENTS NOTED ABOVE

HARD-COPY SUBMITTAL REQUIREMENTS FOR PLANNING BOARD APPLICATIONS:

- A) SEVEN (7) FULL-SIZE PAPER COPIES OF DRAWING SETS

DIGITAL SUBMITTAL REQUIREMENTS FOR FINAL APPROVAL:

- A) INDIVIDUALLY NAMED PDFs OF EACH DRAWING (NOT A COMBINED PDF SET)
 - Individual Drawing PDF Naming Format: 'PROJECT/SHEETSET NAME_INDIVIDUAL DRAWING NAME.pdf'
- B) PDF COPIES OF ALL PERMIT APPROVALS, APPLICATIONS, REPORTS, NARRATIVES, LETTERS, ETC.
- C) FINAL CAD REFERENCE FILES IN DWG FORMAT (SURVEY & PROPOSED DESIGN LINEWORK)
 - All drawings & CAD reference files must be to-scale and within the following coordinate systems:
 - MAINE STATE PLANE WEST NAD83 (Horizontal Datum) & NAVD88 (Vertical Datum)

HARD-COPY SUBMITTAL REQUIREMENTS FOR FINAL APPROVAL:

- A) THREE (3) FULL-SIZE PAPER COPIES OF INDIVIDUAL DRAWINGS REQUIRING BOARD SIGNATURE
- B) ONE (1) FULL-SIZE PAPER COPY OF ENTIRE DRAWING SET FOR ENGINEERING RECORDS

PLEASE CONFIRM WITH PLANNING STAFF FOR CLARIFICATION



June 25, 2024

**Subject: State or Local Permitting
Thatcher Brook Apartments I & II Development
Agent Authorization Letter**

To Whom it May Concern:

Westbrook Development Corporation – Thatcher Brook Apartments I, LP & Thatcher Brook Apartments II, LP have retained Gorrill Palmer to prepare State/Local Permit Applications for the above referenced project. Gorrill Palmer and their subconsultants are authorized to act as an agent for matters related to these permits.

Sincerely,

A handwritten signature in black ink that reads "Tyler Norod".

Tyler Norod
Development Director
Westbrook Development Corporation

CITY OF BIDDEFORD - SITE PLAN APPLICATION DRAWING CHECKLIST

LAST REVISED: 05/17/23

CHECKLIST DIRECTIONS:

- The following checklist must be **completely** filled out by the applicant for any Site Plan submittal to the Planning Department.
- Applicant to confirm all of the items listed are included within the submittal. Any missing items must have adequate reasoning to justify their absence.
- City to review applicant's submittal and checklist responses. Projects missing submittal information with non-acceptable reasoning will be rejected.
- Items in **BLACK** are required for 'Preliminary Site Plan' approval & 'Final Site Plan' approval.
- Items in **BLUE** are only required for 'Final Site Plan' approval.

SUBMITTAL INFORMATION - TO BE FILLED OUT BY APPLICANT	
Project Name:	37 Barra Road - Residential Development
Planning Board # (if available)	
Applicant Name/Info:	Westbrook Development Corporation, Thatcher Brook Apartments I, LP, Thatcher Brook Apartments II, LP
Submittal #/Type (Prelim/Final)	Final Site/Subdivision Plan
Submittal Date:	07.17.2024

ITEM NUMBER	SUBMITTAL REQUIREMENT DESCRIPTION	APPLICANT RESPONSE		CITY REVIEW RESPONSE	
		INFORMATION PROVIDED (YES/NO)	REASON NOT PROVIDED/COMMENT	ACCEPTABLE (YES/NO-REVISE & RESUBMIT)	COMMENT
1	GENERAL PLAN REQUIREMENTS				
	A Drawing specific legends (linetypes, hatches, etc.)	Y			
	B Individual drawing layer control should be utilized: freeze/thawing, changing lineweights, and screening (i.e. screen existing layers on a proposed plan, freeze topography and underground utilities on a nonproposed site plan)	Y			
	C North arrows, standard engineering scale viewports, dated revision block	Y			
	D All drawings and surveys must be in the following coordinate systems: NAD83 Maine State Plane West (Horizontal) and NAVD88 (Vertical)	Y			
	E Drawings need to be designed, signed & sealed by a Maine licensed professional engineer (PE), all boundary survey data needs to be performed by a licensed professional land surveyor (PLS)	Y			
2	COVER SHEET				
	A Project Name & Property Address	Y			
	B Project Team Contact Information (Owner, Engineer, Contractor, etc.)	Y			
	C Site Location Map	Y			
	D Sheet Set List of Drawings	Y			
	E Tax Map and Lot ID	Y			
	F Zoning & Shoreland Zone Information	Y			
	G Existing Use Description	Y			
	H Proposed Use Description	Y			
	I Required Waiver/Variances (Yes/No); if yes, plan must clearly list waivers/variances requesting	N			
	J Name of Drainage Watershed	Y			
	K Within the M54 Urbanized Area (Yes/No)	Y			
	L Natural resources (streams, wetlands, etc.) located on-site or adjacent to the property (Yes/No)	Y			
	M Within the 100-year Flood Zone (Yes/No)	N			
	N Public Road Proposed (Yes/No)	N			
	O Private Road Proposed (Yes/No)	N			
	P Public Sewer Connection (Yes/No); if yes, need to include a proposed sewer flow calculation per Maine's Subsurface Wastewater Disposal Rules, Chapter 241, Section 4 (Tables 4A & 4C)	N	Project connects to an existing onsite stormwater basin		
	Q Public Storm Drain Connection (Yes/No)	Y			
	R Limits of Disturbance in acres	Y			
	S Pervious Land Cover square footage, existing and proposed	Y			
	T Impervious Land Cover square footage (Pavement/Gravel), existing and proposed	Y			
	U Building Roof square footage, existing and proposed	Y			
	V Assigned Planning Board Number				
	W Estimated cut/fill earthwork volumes; if disturbing within Flood Zone, separate set of earthwork volumes required (site vs. within flood zone)	Y	included in estimate		
3	EXISTING CONDITIONS PLAN				
	A Horizontal & Vertical Datums annotated (NAD83 & NAVD88)	Y			
	B Survey Benchmark Locations (with XYZ Coordinates annotated)	N	Not provided on survey plan, will be provided in coordination with contractor		
	C Property & Right-of-Way Lines	Y			
	D Boundary line information (bearings, distances, etc.)	Y			
	E Property pin and monumentation locations	Y			
	F Existing easements with proper ownership identify	Y			
	G Road Names & Individual Lot Labels (Map, Lot, Owner, Acreage)	Y			
	H Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Y			
	I 100-year Flood Zone Limits & Elevation	N	not applicable		
	J USDA-NRCS Soil Boundaries and Labels	N	not applicable		
	K Existing contours with adequate contour labelling; minimum 1" contour interval	Y			
	L Existing building FFEs annotated	N	not applicable		
	M Spot elevations for existing building corners, door entrances, accessible parking/walkways, road centerlines, and bottom/top of curbs	N	not applicable		
	N Existing buildings & structures	Y			
	O Existing pavement areas & number of parking spaces	N	not applicable		
	P Existing ADA ramp geometry, detectable warning plates, and ADA parking space	N	not applicable		
	Q Existing site features (sidewalks, retaining walls, curbing, lightpoles, guide rails, dumpsters, fence line)	Y			
	R Existing signage and striping	N	not applicable		
	S Existing underground utility locations (storm, sewer, force main, water, gas, elec, tel)	Y			
	T Existing above-ground utility locations (manholes, catch basins, utility poles, hydrants, transformers, riprap)	Y			
	U Rim, invert in, invert out, pipe size, cardinal direction (N, E, S, W) information for any existing utility infrastructure being tied into (upstream/downstream/outfalls)	Y			
	V Existing tree lines, street trees, free-standing trees (12" or larger diameter at breast height), and vegetation	Y			
	W Location of any borings, drinking wells, and monitoring wells	N	Geotechnical report is forthcoming.		
4	SITE DEMOLITION & EROSION CONTROL (E&SC) PLAN				
	A Limits-of-disturbance outlined and acreage annotated	Y			
	B Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Y			
	C 100-year Flood Zone Limits	N	not applicable		
	D Callout existing site features to be demolished/removed/replace	Y			
	E Callout existing utilities to be demolished/removed/abandoned-in-place	Y			
	F Hatch existing buildings and pavement to be removed	Y			
	G Construction Entrance location(s)	Y			
	H Perimeter E&SC control location(s) (i.e. silt fence, erosion berm mix)	Y			
	I Stockpile and staging area(s) identified (with proper perimeter control)	Y			
	J Inlet protection location(s)	Y			
	K Note requiring contractor to implement dust control measures throughout construction	Y			

L	Note requiring contractor to pave utility trenches within right-of-way within 3 days of excavation or prior to any rain event	Y			
M	If groundwater expected, show dewatering/silt bag location(s); show temporary pumping routing	N/A			
N	If large development is proposed with an extensive underground stormwater conveyance network, show sediment trap/basin location(s) needed for constructability/phasing; provide sizing calculations	Y			
5	SITE PLAN/SUBDIVISION PLAN				
A	Partial Site Plans needed for any viewpoint scale greater than 1"=20'	Y			
B	Existing property and right-of-way line	Y			
C	Proposed subdivision lot lines and label	Y			
D	Required Zoning Setbacks shown with dimensions and annotation	Y			
E	Bulk requirement summary table (zoning/parking calculations)	Y			
F	Location of any Natural Resources and their respective buffers (wetlands, streams, etc)	Y			
G	100-year Flood Zone Limits	N	not applicable		
H	Proposed building outlines, door entrances and loading dock	Y			
I	Proposed building label	Y			
J	Proposed road extents; provide clear annotation if roads will be public or private	N	not applicable		
K	Proposed parking and accessible parking locations; annotate parking space count	Y			
L	Proposed signage, parking striping, and traffic striping	Y			
M	Detailed ADA ramp geometry, detectable warning surfaces, and ADA parking striping/signage; existing & proposed	Y			
N	Proposed site features (i.e. curbing, walls, fencing, guiderail, fire hydrant, transformers, light pole locations)	Y			
O	Separate hatching for buildings, sidewalks, pavement, landscaping	Y			
P	Proposed landscaping; detailed landscaping design should be on separate plan	Y	Landscape Plan by Landscape Architect to be provided with final submission		
Q	Designated snow storage areas	Y			
R	Proposed dumpster locations and trash removal access	N	not applicable		
S	Linear dimensions of all drive aisles, sidewalk widths, parking spaces, loading dock	Y			
T	Radial dimensions for all curbs, landscaped islands, sidewalk	Y			
U	Road centerline stationing shown, labelled every 0+50' with curve data	N	not applicable		
V	If Private Road is proposed, final recorded plans must clearly note that proposed private roads will not be submitted in the future for public acceptance	N	not applicable		
W	If Private Road is proposed, final recorded plans must clearly note that the City is not responsible for any maintenance, repair, plowing, or trash removal of proposed private roads	N	not applicable		
X	Planning Board signature block for final recording	Y			
6	GRADING PLAN				
A	Partial Grading Plans needed for any viewpoint greater than 1"=20'	Y			
B	Limits-of-disturbance outlined and acreage annotated	Y			
C	Proposed Building Labels with Individual Finished Floor Elevations (FFE)	Y			
D	Existing contours with adequate contour labelling, screened; minimum 1' contour interval	Y			
E	Proposed contours with adequate contour labelling; minimum 1' contour interval	Y			
F	Detailed grading for all ditches, swales, outfalls, and riprap	Y			
G	All proposed contours tie-into existing contours at limits-of-disturbance outlin	Y			
H	Existing spot elevations for all asphalt and curb tie-in location	Y			
I	Location of any Natural Resources and their respective buffers (wetlands, streams, etc)	Y			
J	100-year Flood Zone Limits	N	not applicable		
K	Proposed spot elevations for all important roadway geometric points and/or on a 50' maximum interval: low/high points, PC/PT, road centerline, edge-of-asphalt	N/A			
L	Proposed spot elevations for all curblines (bottom/top-of-curb) and sidewalk	Y			
M	Proposed spot elevations for all parking and drive aisle geometry point	Y			
N	Proposed spot elevations for all building corners and door-entry location	Y			
O	Proposed retaining wall/loading dock elevations (bottom/top of wall)	Y			
P	Proposed spot elevations for all ADA ramp/landing/parking stall geometry point	Y			
Q	Proposed % slope arrows for all ADA parking spaces and sidewalk	Y			
R	Proposed longitudinal % slope arrows for drainage ditch centerline	Y			
S	Proposed % slope arrows for roads, parking areas, and landscape tie-in area	Y			
T	Estimated cut/fill earthwork volumes; if disturbing within Flood Zone, separate set of earthwork volumes required (site vs. within flood zone)	Y			
7	ROAD PROFILES (if public/private road proposed)	N/A			
A	Existing surface; dashed and screened				
B	Proposed surface; continuous and bold				
C	Corresponding centerline stationing and curve data annotation				
D	Road cross-section including proposed surface cross slopes; include multiple sections for various road cross slope conditions proposed (crowned, superelevated)				
E	Horizontal and vertical scale bars				
F	Clear annotation if proposed road will be public or private				
G	If Private Road is proposed, plans must clearly note that proposed private roads will not be submitted in the future for public acceptance				
H	If Private Road is proposed, plans must clearly note that the City is not responsible for any maintenance, repair, plowing, or trash removal of proposed private road				
8	UTILITY PLAN				
A	Existing underground utility locations; screened (storm, sewer, force main, water, gas, electric, telecom)	Y			
B	Existing above-ground utility locations; screened (manholes, catch basins, utility poles, hydrants, riprap)	Y			
C	Rim, invert in, invert out, pipe size, cardinal direction (N, E, S, W) information for any existing utility infrastructure being tied into (upstream/downstream/outfalls)	Y			
D	Proposed underground utility locations; bold (storm, sewer, force main, water, gas, electric, telecom, lighting)	Y			
E	Proposed above-ground utility locations; bold (manholes, catch basins, utility poles, hydrants, transformers, riprap)	Y			
F	Proposed storm culverts, outfalls, and riprap locations and size	Y			
G	Storm/sewer structure labels must include: rim, inverts in, inverts out, pipe sizes, cardinal directions (N, E, S, W)	Y			
H	Storm/sewer pipe labels must include: linear footage, pipe size, material, slope	Y			
I	Flow directional arrows for storm & sewer pipe	Y			
J	Proposed & existing site features shown that could conflict with proposed utilities (trees, signs, lightpoles, bollards, foundations, guiderails)	Y			
K	All storm drains must be sized to convey the 25-year storm	Y			
L	Sewer force main sizes and invert elevation	N/A			
M	Sewer pump station locations, model, rim, inverts, pipe sizes, cardinal directions (N,E,S,W)	N/A			

N	Grease trap & oil-water separator locations, sizes, elevation:	N/A			
O	Water, gas, electric, and telecom sizes labelled	Y			
9	UTILITY PROFILES				
A	Utility profiles for all gravity storm drains and sewer pipes, including all laterals, catch basins, culverts, and outfalls; profiles preferred to be aligned on the pipe centerline (not superimposed on the road centerline)	Y			
B	Existing surface; dashed and screener	Y			
C	Proposed surface; continuous and bolt	Y			
D	Storm/sewer structure labels must include: rim, inverts in, inverts out, pipe sizes, cardinal directions (N, E, S, W)	Y			
E	Storm/sewer pipe labels must include: linear footage, pipe size, material, slope	Y			
F	Existing and proposed gravity pipe crossings shown; sizes labelled and depths/clearance annotated	Y			
G	Existing and proposed electric/water/telecom/gas crossings shown at approximate depths; sizes labelled and depths/clearance annotated	Y			
H	Known ledge or groundwater elevation:	Y			
I	For all storm drains, 25-year HGL must be shown on profiles with starting tailwater condition identified	Y			
J	For storm outfalls, include riprap sizing and grading extent	Y			
K	Horizontal and vertical scale bars	Y			
10	DETAILS				
A	Road section detail, including pavement & gravel depth	Y			
B	Sidewalk, paver, crosswalk, and any other pavement section detail	Y			
C	Pavement sawcut detail	Y			
D	Utility trench/backfill detail	Y			
E	All site feature details; curbing, retaining walls, fencing, guiderails, dumpsters, et	Y			
F	Signage, striping, and ADA detail	Y			
G	E&S notes and details; only show applicable/proposed measure	Y			
H	Utility structure details (manholes, cleanouts, fittings, handholes, transformer pads, hydrants)	Y			
I	Storm outfall & riprap details	Y			
J	Drainage ditch cross section identifying minimum depth, minimum bed width, and maximum side slopes	Y			
K	Pump station, grease trap, and oil-water separator detail	N/A			
L	Conduit section details	Y			
M	Miscellaneous details (as needed)	Y			
11	LANDSCAPING, LIGHTING & PHOTOMETRIC PLANS				
A	As required by ordinance; at a minimum: locations, counts, and species/models must be identified	Y			
B	Landscaping & lighting detail	Y			
12	DOCUMENTS/REPORTS/CALCULATIONS				
A	On initial preliminary submittal applications, applicant must submit a development review and inspection fee. Applicant to coordinate fee amount with City Planner prior to submittal. This fee will be drawn against to cover the following type of services throughout the project life cycle (and may require replenishing): i. 3rd Party City Peer-Review ii. Site Inspections during the permitting process iii. Erosion & Sediment Control Inspections during construction iv. Right-of-Way Inspections during construction	Y			
B	Predevelopment & Post-development Drainage Area Maps, including: i. Subdrainage areas delineated and labeled ii. Points of Interest/Analysis shown and labeled iii. Hatching for different land cover areas (impervious, pervious, gravel) iv. Time of concentration (Tc) paths & durations	N	not applicable. See stormwater memo for analysis.		
C	An approved "Sewer Ability-to-Serve Letter" from the Engineering Department: i. Applicant to submit proposed sewer flow calculations per Maine's Subsurface Wastewater Disposal Rules, Chapter 241-Section 4 (Tables 4A & 4C)	N	Ability to serve requested. Waiting for final review from City.		
D	Performance Guarantee Cost Estimate utilizing Planning's template				
E	For any Site Location of Development (SLODA) project, the applicant's submittal must mimic a formal submittal to DEP. Submit must abide to DEP's SLODA application and include DEP's SLODA Submittal Checklist (Form D)	N	not applicable		
F	25-year hydraulic calculations for all storm conveyance infrastructure (pipes, culverts, drainage ditches) via the rational method; starting tailwater conditions/documentation must be clearly identified	Y			
G	If any SWM water quality BMP or detention facility is proposed, hydrologic model exports/hydrographs must be submitted for the for the 2, 10, 25, & 100-year storm frequencies	N			
H	Sizing calculations for any SWM water quality BMP or detention facility	N			
I	A stormwater maintenance manual for any proposed SWM water quality BMP or detention facility, including: i. Annual maintenance requirements ii. Annual inspection requirements by a licensed PE; noting that all inspection reports/logs need to be submitted to the Engineering Department by March 1st each following year, identifying what on-going maintenance has occurred and what remedial repairs are needed iii. Signed Property Owner Agreement: including the current property owner's contact information and signature; it must be noted that all stormwater BMP maintenance requirements are linked to the property for perpetuity and transfer to any new ownership	N			
J	Salt Management Plan	N/A			
K	Sewer pump station sizing calculations	N/A			
L	Sewer pump station maintenance plan	N/A			
M	Grease trap sizing calculations	N/A			
N	Homeowner Association (HOA) agreement for any private road serving two (2) lots or more	N/A			
O	Summary list & copy of any required DOT/DEP/USACE permits & approvals	N/A			

ATTACHMENT B

WARRANTY DEED

051414

MIKE EON ASSOCIATES, LTD., a Maine corporation with place of business at 260 Main Street, Biddeford, ME, 04005, for consideration paid, grants to **THE INHABITANTS OF THE CITY OF BIDDEFORD**, a body politic and corporate, with a mailing address of 205 Main Street, Biddeford, Maine, with Warranty Covenants, the land and interest in land situated in Biddeford, York County, Maine, described as follows:

MAINE R.E. TRANSFER TAX PAID

A certain lot or parcel of land situated in said Biddeford and being that parcel designated as "LOT 97A" on plan entitled "Final Plan Amended, Cathedral Oaks, Phase III, Lots 93 & 94, Cathedral Oaks Drive, Biddeford, ME, by: MIKE EON ASSOCIATES, LTD., 260 Main Street, Biddeford, Maine", dated July, 1997, prepared by BH2M, Berry, Huff, McDonald, Milligan, Inc., 28 State Street, Gorham, Maine, 04038, duly recorded in York Registry of Deeds in Plan Book 237, page 4, to which plan and the record thereof reference is made for a more particular description of the within conveyed premises.

Also conveying herewith a perpetual right of way and easement to be used in common with Mike Eon Associates, Ltd., its successors and assigns and all others who may now have or may be granted rights in the future by Mike Eon Associates, Ltd., their respective heirs, successors and assigns for the use, introduction, maintenance, repair and replacement of a sanitary sewer line under the surface of the premises hereinafter described and for the construction, maintenance, repair and replacement of a pedestrian walkway and non-motorized bicycle path on and over the surface of the hereinafter described parcel of land. The area encumbered by this right of way and easement shall be that area designated as "ROW RESERVED BY MIKE EON ASSOC. LTD. SEE NOTE 23 TO BE CONVEYED TO THE CITY OF BIDDEFORD SEE NOTE 28" which is a portion of Lot 97 on the above described plan to which reference is made for a more particular description of the within conveyed premises.

It shall be a condition of this grant that the person or entity exercising its rights thereunder shall restore the surface condition of the property to the condition which existed prior to such exercise, or as nearly so as practical, bearing in mind that certain physical improvements are specifically contemplated herein. Mike Eon Associates, Ltd., for itself and its successors and assigns, specifically reserves the right to use such area for all purposes not inconsistent with the grant herein made including, but not limited to, ingress to and egress from Lot #97 on said plan and the installation, use, maintenance and repair of all utility services in, on, over and under the said area.

IN WITNESS WHEREOF, Mike Eon Associates, Ltd., has caused this instrument to be signed in its name and behalf and its seal to be hereunto affixed by Michael R. Eon, its President, thereunto duly authorized this 1st day of October, 1997.

Michael R. Eon

WITNESS:

Richard A. Houtts

Mike Eon Associates, Ltd.

by: Michael R. Eon
Michael R. Eon, President

STATE OF MAINE
YORK, ss

November
October, 1997

Personally appeared the above named Michael R. Eon, President of Mike Eon Associates, Ltd., and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of said corporation.

Before me,

Richard A. Houtts

Notary Public/Attorney at Law

Print name: Richard A. Houtts

deed/0270-023/f drive
revised 10/22/97

RECEIVED YORK S.S.

1997 NOV 12 A 9:34

2

ATTEST: Lois M. Meier
REGISTER OF DEEDS

Return to:
City of Bedford
att: Bruce Conway
305 Main St.
Bedford, NH
04005

288 (147)

OPTION TO PURCHASE AGREEMENT

THIS OPTION TO PURCHASE AGREEMENT (the "Agreement") is entered into effective 4 day of June, 2024 (the "Effective Date"), between the CITY OF BIDDEFORD, a Maine municipal corporation having a mailing address of 205 Main Street, Biddeford, Maine 04005 ("Seller"), and WESTBROOK DEVELOPMENT CORPORATION, a Maine nonprofit corporation having a mailing address 30 Liza Harmon Drive, Westbrook, Maine 04092, or its assigns ("Buyer").

RECITALS

WHEREAS, Seller is the owner of a certain parcel of land located at 37 Barra Road, Biddeford, Maine being Lot 1 as depicted on a certain Fifth Amended Subdivision Plan (the "Plan") prepared for the City of Biddeford by Owen Haskell, Inc. dated September 12, 2014, and recorded in the York County Registry of Deeds in Book 371, Page 50 ("Seller's Property"); and

WHEREAS, Seller wishes to grant to Buyer, and Buyer wishes to accept, an option to purchase the Seller's Property (together with any easements for access and stormwater management reasonable for the development of the property for the Buyer's purpose, the "Option Premises"), for the construction of one or more affordable multi-family apartment buildings constructed across one or more phases (the "Project"), upon the terms and conditions as set forth herein.

NOW, THEREFORE, in consideration of one dollar (\$1.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

- 1) **Option Period; Exercise of Option; Amendment to Exhibit A.** Seller hereby grants to Buyer for \$1.00 (the "Option Payment") the exclusive option, for a period ending December 31, 2026 (the "Option Period"), to purchase the Option Premises upon the terms and conditions stated herein (the "Option"). Buyer may exercise the Option at any time during the Option Period by giving written notice to Seller of its intent to do so (the "Purchase Notice").
- 2) **Purchase Conditioned Upon Use as Affordable Housing.** The Buyer hereby acknowledges that the Option and the obligations of the Seller to convey the Option Premises to the Buyer is conditioned upon the Buyer agreeing to use the Option Premises for the creation of Affordable Housing. For purposes of this agreement, Affordable Housing shall mean the following: (a) for rental housing a development in which a household whose income does not exceed 80% of the area median income for the area as defined by the United States Department of Housing and Urban Development under the United States Housing Act of 1937, Public Law 75-412, 50 Stat. 888, Section 8 (as determined by HUD "AMI"), as amended, can afford a majority (51% or greater) of the units in the development; or (b) for resident owned housing, a development in which a household whose income does not exceed 120% of AMI can afford a majority (51% or greater) of the units in the development. This condition shall be satisfied for purposes of proceeding with sale of the

Option Premises to the Buyer by a notice to proceed from Maine State Housing Authority for the construction of affordable housing using Low Income Housing Tax Credits, a commitment for debt or equity financing for the construction of affordable housing a condition of which will be the Buyer's entry into an affordability covenant, or a commitment for conventional financing where the Buyer also agrees to enter into a separate affordability covenant that meets the affordability criteria of this Section 2 with an entity that meets the definition of a "Qualified Holder" under 33 M.R.S.A. § 121(3).

- 3) **Due Diligence.** Within five (5) business days after the Effective Date, Seller shall provide Buyer with all surveys, title policies, environmental reports in its or its agents' possession including without limitation copies of any surveys of the Option Premises within Seller's or Seller's agents' possession promptly following the Effective Date of this Agreement.

Buyer and others whom Buyer may designate shall have the right, at all reasonable times, at Buyer's sole cost and expense, risk and hazard, to enter upon the Option Premises to examine and/or show the same and make, or cause to be made, engineering studies with respect thereto, including, without limitation, surveying, conducting test borings in order to determine sub-soil conditions, and in general conducting all other tests, analysis and studies of the Option Premises which Buyer deems prudent in connection with Buyer's intended development or use of the Option Premises. If Buyer does not exercise the Option, Buyer shall promptly restore the surface of the Option Premises as reasonably as possible to its pre-existing condition, unless otherwise agreed by Seller.

Seller hereby acknowledges, that to extent required by the Project funding, the Buyer's exercise of the Option and the carrying out of the Project is dependent on the results on environmental review requirements of Maine State Housing Authority or the Department of Housing and Urban Development.

- 4) **Extension.** Prior to the expiration of the Option Period, Buyer shall have the right to extend the Option Period for a period of one (1) year by providing written notice to Seller thereof.
- 5) **Purchase Price.** If Buyer exercises the Option, the purchase price for the Option Premises shall be One Dollar (\$1.00).
- 6) **Closing.** If Buyer exercises the Option, the Closing shall occur within thirty (30) days of the delivery of the Purchase Notice, at a time that is mutually agreeable to the Buyer and Seller at the offices of the Buyer's attorney, Drummond Woodsum, 84 Marginal Way, Suite 600, Portland, Maine 04101. The deed and other customary transfer documents are to be delivered at the Closing.
- 7) **Conditions to Sale.** If Buyer exercises the Option, the following terms and provisions shall apply:
- a) Title to the Option Premises shall be conveyed to Buyer by good and sufficient Warranty Deed which deed shall convey good and clear record and marketable title to the Option Premises, free from encumbrances except provisions of existing building and

zoning laws and any covenants and/or easements of record provided that the same do not interfere with Buyer's intended use of the Option Premises; such real estate taxes for the then current tax period which are not due and payable on the date of delivery of such deed; utility, access, drainage or other similar easements in connection with adjoining properties, and any matters of record which in Buyer's opinion do not interfere with Buyer's plans to develop the Option Premises. Buyer shall notify Seller of any defects in title that would make Seller unable to give title to the Option Premises as herein stipulated. Seller shall be obligated to proceed in good faith to cure any such title defect(s). If required, the Closing shall be extended to allow Seller time to cure any such title defects, but in no event shall the Closing be extended more than thirty (30) days for such purposes. If a title defect exists, Buyer may elect, by written notice to Seller, either (i) to accept title to the Option Premises subject to any uncured defects in title or (ii) to terminate the Option, whereupon any Option Payment or extension fees paid by Buyer to Seller shall be immediately refunded to Buyer, the obligations of all parties hereunder shall cease, and neither party shall have any claim against the other by reason of this Agreement.

- b) In furtherance of the preceding subsection 7.a., the Buyer and Seller agree to, either as part of the deed described herein or through a separate easement agreement, to negotiate and enter into terms governing the Seller's reserved easement rights to the area shown on the Plan as "Easement to Benefit the City of Biddeford (to be centered on sanitary sewer)", which allows for non-exclusive use of the easement area by the Seller for the existing sewer line located therein and the maintenance of the same, in a manner that is compatible with the Buyer's intended use of the Option Premises.
 - c) Seller shall not mortgage, encumber, or alter the use of the Option Premises prior to the Closing without the prior consent of the Buyer, and shall maintain it consistent with the manner in which the Seller has operated and maintained the Option Premises prior to this Agreement. Full possession of the Option Premises is to be delivered at the Closing, free of all tenants and occupants and otherwise in the same condition as it is now. Buyer and Buyer's agents may inspect the Option Premises up to forty-eight (48) hours prior to the Closing in order to determine whether the condition of the Option Premises complies with the terms and conditions of this Agreement. Seller agrees to provide prompt written notice to Buyer of any newly arising or newly discovered defects with respect to the Option Premises.
 - d) Each party shall pay one-half of the Maine real estate transfer tax unless otherwise exempt.
- 8) **Representations.** Seller represents, covenants and warrants to and agrees with Buyer that (i) Seller is the current owner of the Option Premises and has the legal right, power and authority to enter into this Agreement and to perform all of its obligations hereunder, and (ii) the execution and delivery of this Agreement and the performance by Seller of the obligations hereunder will not conflict with, or result in breach of any regulation, order, judgment, injunction or decree of any court or governmental authority or any agreement or instrument to which Seller is a party or by which Seller is bound, except as otherwise

provided for herein, and (iii) that there is no pending or, to the best of Seller's knowledge, threatened action or proceeding before any court, governmental agency or arbitrator relating to or arising out of the ownership of the Option Premises or any portion thereof, or which may adversely affect Seller's ability to perform this Agreement, or which may affect the Option Premises or any portion thereof.

Seller further represents and warrants that (i) the Seller has not received any notice from any governmental authority that (A) the Option Premises is in violation of any environmental laws, (B) the Option Premises contains any hazardous materials, or any person or entity has caused or permitted any hazardous material to be manufactured, generated, processed, produced, disposed on, at, through, or under the Option Premises or any hazardous materials to be placed stored, held, transferred, or transported from or to the Option Premises, (C) there has been a release of hazardous materials on, in, at, under, or from the Option Premises, or (D) Seller is subject to any environmental action in connection with the Option Premises; (ii) during Seller's ownership of the Option Premises, no underground tanks have been installed on, in, or under the Option Premises, except as disclosed to the Buyer within five (5) days of the Effective Date; (iii) to the best of Seller's knowledge, it is not in breach of or has any liability under or with respect to any environmental law with respect to the Option Premises; and (iv) Seller has not received any notice of any contemplated, proposed, or pending environmental action with respect to the Option Premises.

Buyer represents, covenants and warrants to Seller that Buyer has the legal right, power and authority to enter into this Agreement and to perform all of its obligations hereunder, and, subject to approval by its lender, the execution and delivery of this Agreement and the performance by Buyer of its obligations hereunder: (i) have been duly authorized by all requisite action; and (ii) will not conflict with, or result in a breach of, any of the terms, covenants and provisions of the by-laws or articles of organization of Buyer or any law or any regulation, order, judgment, writ, injunction or decree of any court or governmental authority, or any agreement or instrument to which Buyer is a party or by which it is bound.

- 9) **Further Assurances.** The parties agree that up to and after the date of closing, they shall do such things and execute, acknowledge and deliver any and all additional instruments, documents and materials as either party may reasonably request to fully effectuate the purposes of this Agreement.
- 10) **Risk of Loss.** The risk of loss shall remain on Seller at all times until closing.

- 11) **Notices.** Except where expressly stated otherwise, any notice relating in any way to this Agreement shall be in writing and shall be delivered to the other party by (a) registered or certified mail, return receipt requested, (b) overnight by a nationally recognized courier, (c) hand delivery obtaining a receipt therefor, or (d) email, addressed to the parties as follows:

To Seller: CITY OF BIDDEFORD
205 Main Street
Biddeford, Maine 04005
Attention: _____
Email: _____

With a copy to: [INSERT COUNSEL]

To Buyer: Westbrook Development Corporation
Attn: Tyler Norod, Development Director
30 Liza Harmon Drive, Westbrook, Maine 04092
Email: tnorod@wdc.org

With a copy to: Robert M. Liscord
Drummond Woodsum
84 Marginal Way, Suite 600
Portland, Maine 04101-2480
Email: rliscord@dwmlaw.com

Notices shall be deemed delivered upon such hand delivery, or upon the earlier of either (i) the date delivered or (ii) the date of delivery, refusal or non-delivery as indicated on the return receipt, in the case of notice by registered or certified mail or overnight courier as provided above.

Notice by email shall be deemed delivered upon sending, except if the sender receives an "out of office" or "undeliverable" or similar message indicating that the email was not immediately received by the other party, such notice shall be deemed ineffective and must be provided by one of the other methods permitted herein.

Either party may, by such manner of notice, substitute persons or addresses for notice other than those listed above.

- 12) **Memorandum.** Seller and Buyer agree that this Agreement may not be recorded but the Buyer may request that the Seller and Buyer execute a Memorandum in the form mutually agreeable to the parties which may be recorded at the Cumberland County Registry of Deeds at the option and expense of Buyer.
- 13) **Assignment.** Buyer may assign this Agreement without the prior consent of the Seller to one or more entities formed by the Buyer for the purpose of carrying out the Project.

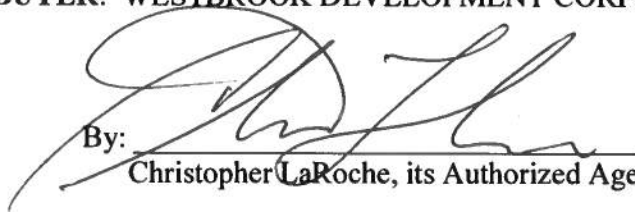
14) **Miscellaneous.** This Agreement shall be binding upon and inure to the benefit of the heirs, successors and assigns of the parties. Headings are for convenience of reference only and have no independent legal significance. This Agreement may not be modified, waived or amended except in a writing signed by the parties hereto. No waiver of any breach or term hereof shall be effective unless made in writing signed by the party having the right to enforce such a breach, and no such waiver shall be construed as a waiver of any subsequent breach. No course of dealing or delay or omission on the part of any party in exercising any right or remedy shall operate as a waiver thereof or otherwise be prejudicial thereto. Any and all prior and contemporaneous discussions, undertakings, agreements and understandings of the parties are merged in this Agreement, and the exhibits referenced herein, which alone fully and completely express their entire agreement. It is expressly understood and agreed that time is of the essence with respect to this Agreement. If any term or provision of this Agreement, or the application thereof to any person or circumstance shall be held to be invalid, illegal or unenforceable by a court, such term or provision shall be deemed stricken and the remainder of this Agreement, or the application of such provision to persons or circumstances other than those as to which this Agreement is held to be invalid or unenforceable, shall continue to be valid and binding upon the parties hereto, who agree that this Agreement shall be reformed to replace the stricken part with a valid and enforceable provision that comes as close as possible to expressing the intent of the stricken provision. This Agreement shall be governed by and construed and enforced in accordance with the laws in effect in the State of Maine.

IN WITNESS WHEREOF, the Buyer and Seller have caused this Option to Purchase Agreement to be executed by their undersigned representatives, thereunto duly authorized, as of the date first above written.

SELLER: CITY OF BIDDEFORD

By: 
James A. Bennett, City Manager

BUYER: WESTBROOK DEVELOPMENT CORPORATION

By: 
Christopher LaRoche, its Authorized Agent

**SIGNATURE PAGE TO OPTION TO PURCHASE AGREEMENT
BARRA ROAD BIDDEFORD**

ATTACHMENT C



June 24, 2024

City of Biddeford
Attn: Planning Board
205 Main Street
Biddeford, ME 04005

RE: Planning Board Application

To Whom It May Concern:

We have been working with Westbrook Development Corporation on their application for an upcoming approximately 80-unit affordable housing project (Thatcher Brooks Apartments) located at 37 Barra Road in Biddeford. Westbrook Development Corporation is an established and valued customer of Gorham Savings Bank. They have ample liquid funds and a long history of banking and lending with Gorham Savings Bank. Please be advised they have the cash resources, financial capacity, and track record to successfully complete this project.

Please feel free to contact me with any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "MWE", is positioned above the printed name.

Matthew W. Early
SVP, Commercial Banker
Gorham Savings Bank

MWE/JML

Company Profile



Westbrook Development Corporation

Unique housing initiatives are the hallmark of Westbrook Development Corporation (WDC). More than 30 years after our founding, WDC has grown from an extension of a government-funded local housing authority to a widely recognized leading non-profit developer of affordable and workforce housing.

Our diverse development portfolio showcases our versatility, including a 100-unit, multistory apartment building, a charming single-family townhouse community, luxurious market-rate condominiums fashioned from a historic schoolhouse, and contemporary industrial-style lofts converted from an abandoned riverside mill. From affordable rental communities catering to seniors and residents with disabilities to pioneering homeownership opportunities for first-time buyers, WDC takes pride in delivering distinctive housing solutions.

At our core, WDC is deeply committed to fostering sustainable long-term growth of affordable housing across Greater Portland and Southern Maine. Rather than imposing developments on cities and towns, we prioritize collaboration. We work hand in hand with city officials, civic leaders, neighborhoods, and residents to understand their needs and aspirations, ensuring that the housing solutions we create reflect their desires.

Our message to all communities is simple yet powerful: "Tell us what you want. We listen." By embracing this ethos, we consistently empower communities with the housing options they seek, making a lasting positive impact on the lives of countless individuals and families. With each project we undertake, WDC reaffirms its position as a leader in affordable and workforce housing development, dedicated to shaping a better, more inclusive future for all.

Tyler Norod – Development Director

Tyler joined WDC in 2021 as Development Director. Prior to WDC, Tyler worked as a Development Officer for Avesta Housing, where he lead the development efforts on a variety of large projects across Southern Maine and New Hampshire. These projects included historic rehabilitation, Passive House Certified buildings, and a multi-phased mixed-use urban development.

Over the course of his career, Tyler has overseen 13 affordable housing developments with a total development cost in excess of \$160 million. In total, these projects represent approximately 500,000 square feet of development and 500 units of housing. Tyler's projects have been recognized by GrowSmart Maine and the Maine Real Estate Development Association (MEREDA) as well as the prestigious national Charles L. Edson award for Tax Credit Excellence.



Before working as a developer, Tyler was the Housing Planner for the City of Portland, where he implemented new housing policies and oversaw allocation of City resources to spur new affordable housing development. Tyler also served as a Senior Project Manager at the Boston Redevelopment Authority (BRA). While at the BRA, he managed the public review process and community benefit negotiations for several million square feet of development, including transitional housing for homeless veterans; housing for low-income seniors; and community-driven, mixed-income residential developments.

Tyler's academic background includes a BA in Political Science from St. Mary's College of Maryland, providing him with a strong foundation for his work in the housing development sector. With his wealth of experience and dedication to creating affordable housing solutions, Tyler continues to drive positive change and make a lasting impact in the communities he serves.

Maggie Stanley - Construction Services Director

As a Licensed Maine Architect, Maggie comes to WDC from a different side of the table from most in development. Her background is in the design and construction administration of multi-family and historic buildings in and around Southern Maine. She joined WDC in 2022 after several years working for CWS Architects where her focus was in senior and family housing developments and rehabs for Avesta, Portland Housing Authority and Community Housing of Maine. While at CWS, Maggie acted primarily as a Construction Administrator, working with contractors and owners to navigate unforeseen conditions and provide oversight that the projects were built as designed.

Prior to CWS Architects, Maggie spent much of her early career at Goduti/Thomas Architects where she became licensed while working on high end residential homes and ski resorts, although most of her time spent there was working in Historic Rehabilitation, converting historic buildings into affordable multi-family developments. These historic projects were reviewed by the National Park Service and received National Historic Registration upon completion. While at Goduti/Thomas Architects, numerous projects she worked on received Maine Preservations Awards and the Southgate House in Scarborough was recognized nationally for excellence due to its impactful use of Low-Income Housing Tax Credits.

She earned her Bachelors of Architecture from Syracuse University during which she spent her breaks working property maintenance turning apartments in Syracuse and as an electricians assistance at home on Mount Desert Island.

Maggie also is the former chair and current member of the Portland Planning Board. She is currently serving out her third, three-year term. It has been her time spent on the board, and the deep dive into urban planning, zoning and how policies can shape cities and our built environment that led to her passion for smart development. She hopes to continue to explore these ideas at WDC and act as a liaison between many parties involved from early design through construction, ultimately creating a product that best benefits the community and the end user of these spaces.



ATTACHMENT D



June 20, 2024

Jacob Curtis
Gorrill Palmer
330 Southborough Drive, Suite 200
South Portland, ME 04106

Re: Ability to Serve Determination – 37 Barra Road, Biddeford

Greetings,

The Maine Water Company (MWC) has received your request on the behalf of your client, Westbrook Development Corporation, for an Ability to Serve Determination for the above-referenced project. The request specifies a plan to construct a 76-unit residential development and associated utility infrastructure improvements. The expected peak domestic service demand is 32,220 gallons per day. The expected fire service demand is currently unknown.

Domestic water is available for your project from the existing 12-inch ductile iron main in the Barra Road Right-of-Way to serve the project. Based on the criteria provided by the developer's agent, the expected increase in water usage is within the Biddeford Saco Division of MWC's available system capacity. The static pressure in the area is approximately 60 psi. Additional infrastructure improvements may be required at the expense of the developer to meet the overall needs of this project.

Conditions of Service

- MWC has the understanding that fire service demand is unknown at this time, are not be included in this request, or accounted for in this Ability to Serve Determination.
- If fire service is required, a hydrant flow test at the nearest available hydrant will need to be conducted and analyzed by the sprinkler designer to ensure that adequate flows can be met during a peak fire demand event.
- The developer is required to pay for the cost of any modification, renewal of impacted service lines, and retirement of unused or discontinued services to MWC standards of best practice.
- Additional plan approval, paperwork, and fees associated with this project will require proper coordination with MWC. MWC requires upfront payment for inspection and paperwork to be fully completed before any construction on waterworks materials.
- Service lines must comply with MWC Cross Connection Control Program.
- Allow up to 30 days for the MWC utility review process once final plans are ready to be completed before any construction on waterworks materials will be approved.

Should a request for service or completion of the project not be executed within one year of the date of this letter, MWC reserves the right to reevaluate its ability to serve this project.

All work must be completed in accordance with MWC Terms and Conditions as well as material specifications. All appropriate paperwork must be completed, and deposit paid prior to the start of construction. Please forward all design plan revisions as the project develops to prevent construction delays. Water service will be provided in accordance with Maine Public Utility Commission rules. If you have any additional questions, please do not hesitate to contact our office at 1-800-287-1643 or by email at Patrick.Gere@mainewater.com. We look forward to working with you throughout design and construction.

Sincerely,
The Maine Water Company

A handwritten signature in black ink, appearing to read "P. Gere", written over a horizontal line.

Patrick Gere, PE
Project Engineer

From: [Patrick Gere](#)
To: [Jacob Curtis](#)
Cc: [Kaleb Bourassa](#); [Michael Hall](#)
Subject: RE: Proposed Development - 37 Barra Road Biddeford Maine
Date: Thursday, July 11, 2024 9:30:23 AM
Attachments: [image002.png](#)

Hi Jacob,

We feel the change in geometry and grade is reasonable. If possible, we would like a gate approximately halfway down the access road so we can pull in and park and have room to be out of the way to unlock it.

Note is it extremely important to us to maintain access at all times to the building during and after construction. This station provides domestic and fire service to a large area. Please add a note to the plan to reflect this requirement.

Please keep myself and our Superintendent, Mickey Hall (cc'd), informed of the selected contractor and construction schedule once set. Mickey will be the MWC point of contact during construction, his contact information is below.

Mickey Hall
Superintendent Maine Water Company
93 Industrial Park Rd
Saco ME 04072
Cell 207-615-2518

Thank you,
Patrick

Patrick Gere, PE
Project Engineer



Cell: 207-468-8808

From: Jacob Curtis <jcurtis@gorrillpalmer.com>
Sent: Tuesday, July 9, 2024 1:50 PM
To: Patrick Gere <Patrick.Gere@MaineWater.com>
Cc: Kaleb Bourassa <kbourassa@gorrillpalmer.com>
Subject: RE: Proposed Development - 37 Barra Road Biddeford Maine

CAUTION: This email originated outside the SJWG organization.

Hi Patrick,

The proposed grade at the drive entrance from Barra Road will be flattened to accommodate the parking and entrance design and the grade towards the pump station then increases to ~10.5% to match into the existing pavement at the front of the pump building. The existing access drive has a max grade ~8%. I've attached the grading plan and survey for you to review if needed, let me know

if you have any questions.

Thanks,

Jacob Curtis | Design Engineer



300 Southborough Drive, Suite 200 | South Portland, ME 04106
207.772.2515 x314 (office) | 207.313.7090 (mobile)
GorrillPalmer.com

From: Patrick Gere <Patrick.Gere@MaineWater.com>
Sent: Tuesday, July 9, 2024 9:12 AM
To: Jacob Curtis <jcurtis@gorrillpalmer.com>
Cc: Kaleb Bourassa <kbourassa@gorrillpalmer.com>
Subject: RE: Proposed Development - 37 Barra Road Biddeford Maine

Hi Jacob,

We are reviewing the changes to the access drive with our Superintendent and will follow up later this week. In the meantime, will you describe the change in grade?

Thank you,
Patrick

Patrick Gere, PE
Project Engineer



Cell: 207-468-8808

From: Jacob Curtis <jcurtis@gorrillpalmer.com>
Sent: Monday, July 8, 2024 11:28 AM
To: Patrick Gere <Patrick.Gere@MaineWater.com>
Cc: Kaleb Bourassa <kbourassa@gorrillpalmer.com>
Subject: Proposed Development - 37 Barra Road Biddeford Maine

CAUTION: This email originated outside the SJWG organization.

Hi Patrick,

Just wanted to follow up with you regarding the proposed development at 37 Barra Road. Has there been any further review on this project?

As noted previously, this project proposes changes that may affect the access to the existing booster pump station in the southeast corner of the lot, and we would like to coordinate with

Maine Water to ensure that sufficient access to the pump station will be maintained.

I have included Site and Utility plans from a recent preliminary site & subdivision application to the City of Biddeford for you to review. It is our intent to submit a final site plan & subdivision application on July 17th. Please let me know if you need any more information.

Thank you,

Jacob Curtis | Design Engineer



300 Southborough Drive, Suite 200 | South Portland, ME 04106

207.772.2515 x314 (office) | 207.313.7090 (mobile)

GorrillPalmer.com

This electronic message, the identity of any senders and recipients and the contents of any attachment are confidential and protected from disclosure. The information is intended to be used solely by the recipient(s) named. If you are not an intended recipient, be aware that any review, disclosure, copying, distribution or use of this transmission or its contents is prohibited. If you have received this transmission in error, please notify the sender immediately.

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City of Biddeford, Maine

City of Biddeford

Public Works Department / Engineering Division/Wastewater Administration Division
P.O. Box 586, 205 Main Street, Suite 301
Biddeford, ME 04005
Phone: (207) 284-9118, Fax: (207) 571-0662

Letter of Wastewater Treatment Plant Capacity to Serve Residential Use Development Road

Westbrook Development Corp
c/o Gorrill Palmer
300 Southborough Drive Suite 300
South Portland, Maine 04106

July 11, 2024

Brief description of project: **Proposed Residential Housing Project on Barra Road, Westbrook Development Corp. Biddeford, Maine**

Determination

The applicant is proposing a residential housing development off Barra Road. Based on the information provided in the most recent e-mail received from you, dated June 13, 2024, it is currently projected that the proposed development project will add an estimated additional 12,000 gallons per day of flow to the system. Changes to the project from that presented to this department will require a new review of the request for ability to serve. This determination will be effective for a period of one year from the date above.

The City of Biddeford Wastewater Department has reviewed the request for the ability to serve the above described project. It has been determined that at this time, once the flow reaches the wastewater treatment facility, the City's treatment facility has sufficient capacity to treat the estimated flows from the above described project. **However**, it should be noted, based on studies performed by the City's engineering consultant, there are sewer and pump station capacity issues in many of the City's sewershed areas that must be addressed in order to allow any additional or new flow into the collection and conveyance system. Such sewer capacity deficits were identified in the Thatcher Brook and Main Street sewersheds resulting from flows from this proposed development.

205 Main Street, Biddeford, ME 04005 P: 207.284.9313 F: 207.571.0678 www.biddefordmaine.org

*The City of Biddeford is an equal opportunity provider. To file a complaint, write to
Human Resource Director, 205 Main Street Biddeford, ME 04005, or call (207) 286-0593.*

Upgrades at both the Thatcher Brook Pump Station and the Main Street Pump Station will be required to include larger pumps and controls, a new suction line from the wet well, increased wet well capacity, and larger pressure force main piping. City Staff is currently evaluating and costing the improvements needed to address the capacity issues. Once determined, this development will be expected to pay the proportionate share of the improvements.

Additionally, upon approval of the Planning Board, the applicant must make an application for sewer service and pay the respective sewer permit fees. Flow amounts for the project will be determined at the time application is made and may or may not be the amount stated above. Final building floor plans shall be submitted at the time of application. The applicant will be required to pay all fees based on the flow amount calculated at the time application is made and prior to the issuance of any building permits. No roof drains shall be connected into the sewer system.

This Capacity to Serve Letter is intended only to indicate that the City of Biddeford Wastewater Treatment Facilities has the ability to handle and treat the flow from the above stated project once it is received at the treatment facility. Project design plans must be submitted to the City for review and comment. The Planning Department, Engineering Department or other persons from the Wastewater Department may require further studies, calculations or documentation to determine the actions that will need to be taken to address any impacts/capacity issues including, but not limited to, any system upgrades that may be required to address the impacts this project will have on the City's sewerage collection and/or conveyance system(s) or its components.

Thomas Milligan, PE
City Engineer Emeritus
City of Biddeford Engineering Department
Tom.milligan@biddefordmaine.org
207-284-9118

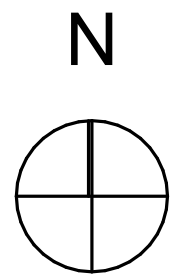
CC: Jeff Demers, Public Works/Wastewater Director
Roby Fecteau, Code Enforcement
David Galbraith, City Planner
Alex Buechner, Wastewater Superintendent
Craig Chekan, City Engineer
George Gervais, ED Director

ATTACHMENT E



SITE PLAN





TOTAL FLOOR AREA:
10,852 sq ft

① LEVEL 2
SCALE: 1/8" = 1'-0"



Kaplan
Thompson
Architects

102 Exchange Street Portland, ME 04101
(207) 842-2888 kaplanthompson.com

FAMILY BUILDING PLAN - UPPER LEVELS

WDC_B

37 Barra Rd. Biddeford, ME 04005



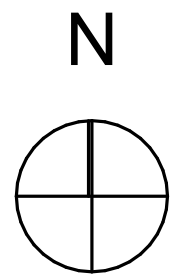
TOTAL FLOOR AREA:
9,667 sq ft

7 LEVEL 1
SCALE: 1/8" = 1'-0"

Kaplan
Thompson
Architects

SENIOR BUILDING PLAN - GROUND LEVEL

WDC_B
37 Barra Rd. Biddeford, ME 04005



TOTAL FLOOR AREA:
9,667 sq ft

1 LEVEL 2
SCALE: 1/8" = 1'-0"



Kaplan
Thompson
Architects

SENIOR BUILDING PLAN - UPPER LEVELS

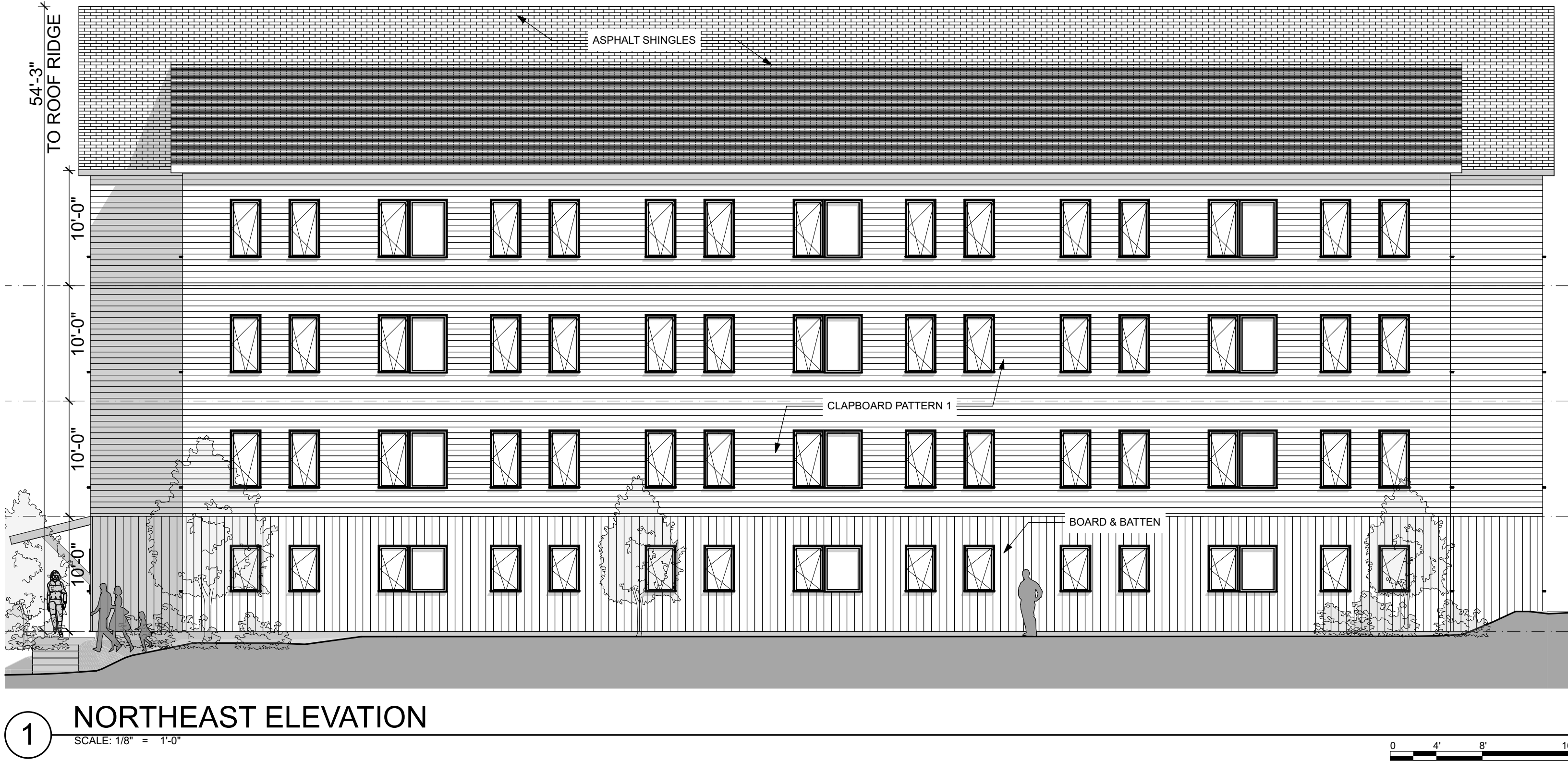
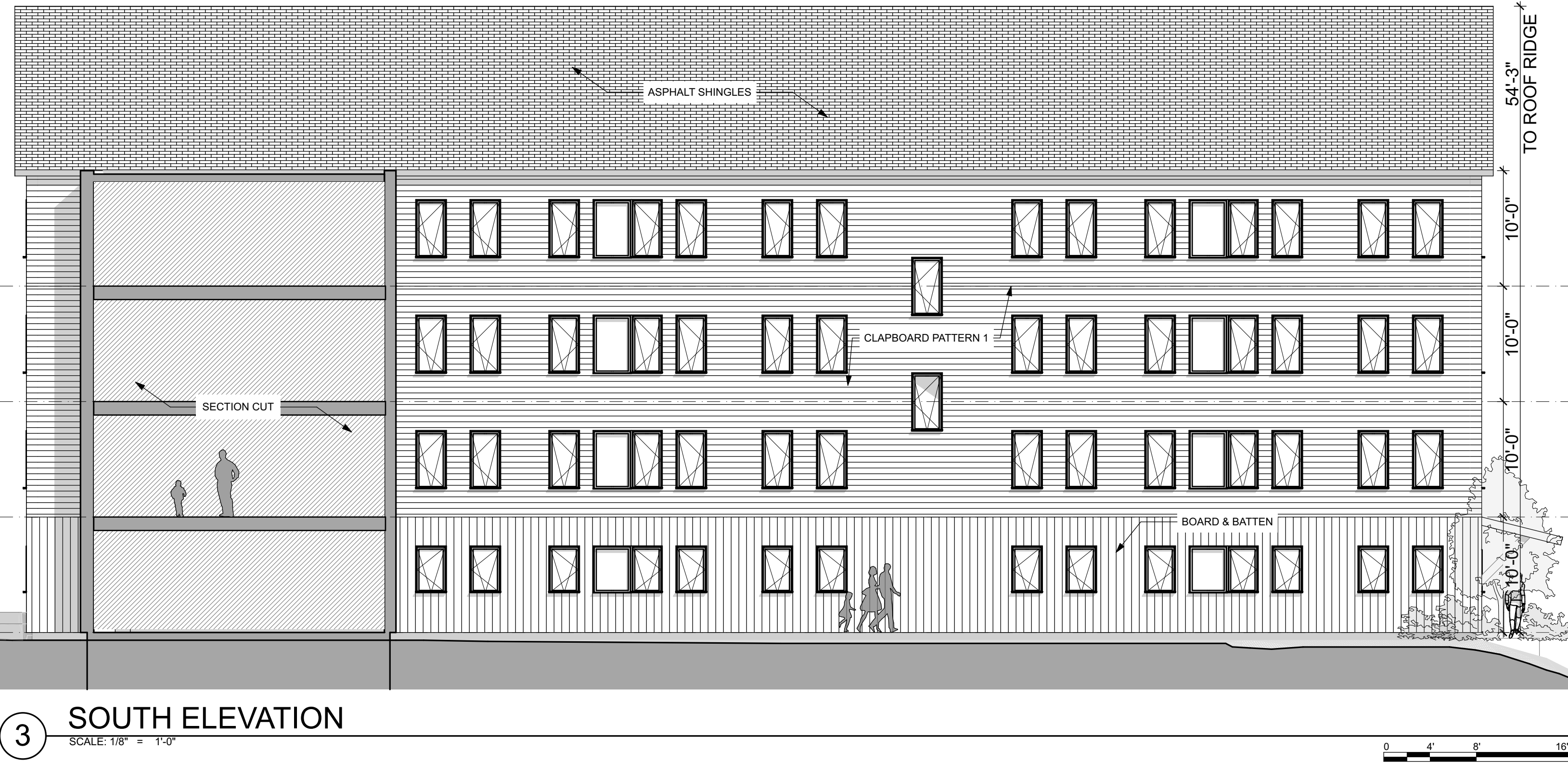
WDC_B
37 Barra Rd. Biddeford, ME 04005

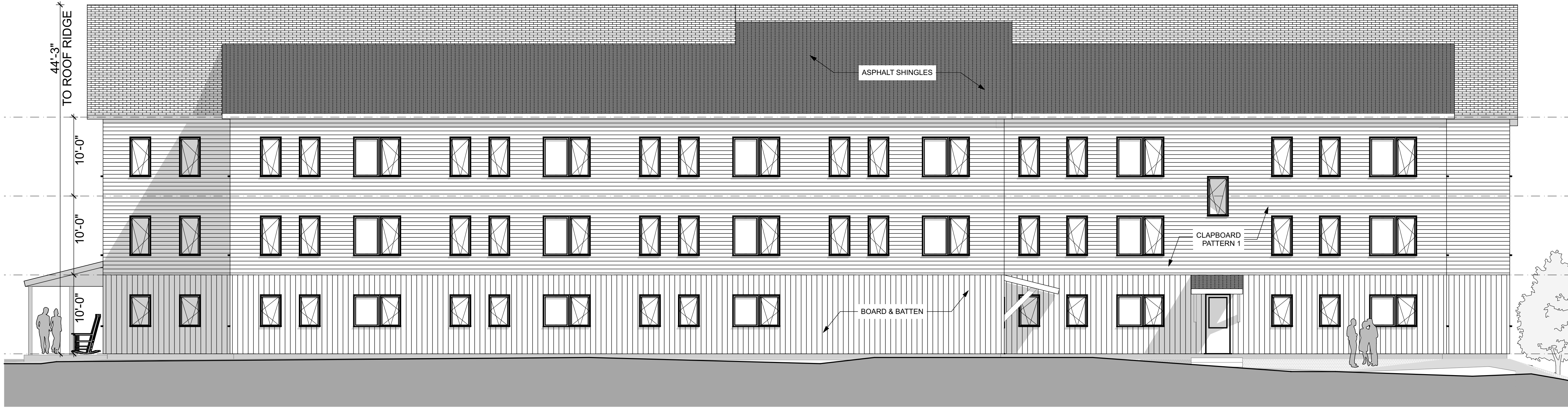


2 NORTH ELEVATION
SCALE: 1/8" = 1'-0"



1 SOUTH ELEVATION
SCALE: 1/8" = 1'-0"





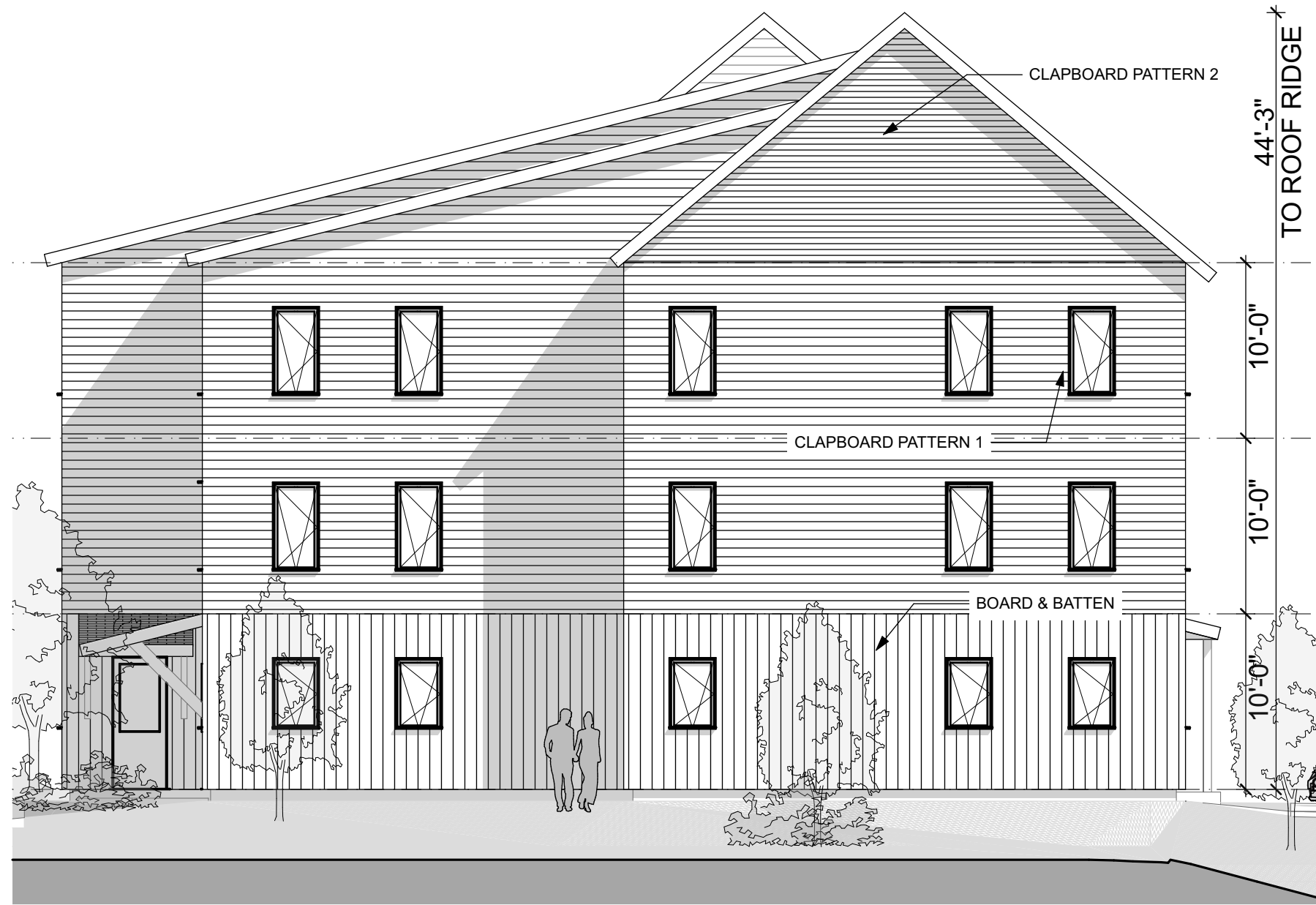
4 NORTH ELEVATION
SCALE: 1/8" = 1'-0"



2 EAST ELEVATION
SCALE: 1/8" = 1'-0"



3 SOUTH ELEVATION
SCALE: 1/8" = 1'-0"



1 WEST ELEVATION
SCALE: 1/8" = 1'-0"

ATTACHMENT F

Project Photos – Thatcher Brook Apartments I & II



Entrance to Lot 1 from Barra Road (Looking West)



Maine Water Pump Station Building (Looking Southwest)



Sewer Easement (Looking West)



Sewer Easement (Looking Northwest)



Sewer Easement (Looking West)



Drive and Pump Station from Sewer Easement (Looking East)



Sewer Easement (Looking Northeast)



South Edge of Pond (Looking North)



Existing Pond (Looking North)



Existing Pond at Outlet (Looking Northeast)



Outlet of Pond (Looking South)



Pond Outflow into Wetland (Looking South)

ATTACHMENT G

Stormwater Management Memo

To: Mr. David Galbraith
City Planner

From: Kaleb Bourassa, PE

Date: July 17, 2024

Re: Proposed Residential Development
37 Barra Road, Biddeford , ME
Westbrook Development Corporation

Task

Perform a stormwater management analysis for the proposed development of two (2) multi-family buildings at 37 Barra Road in Biddeford, ME.

References

- Field reconnaissance by Gorrill Palmer
- Compiled Survey At 37 Barra Road, Biddeford, Maine dated May 24, 2024 prepared by Owen Haskell
- Civil Plans and permit materials for "MeDEP Site Location Permit Exit 4 Business Park" dated November 1998, and prepared by DeLuca-Hoffman Associates, Inc.
- MeDEP Site Location of Development Act Permit Order #L-19832-39-A-N
- Civil Plan Set dated June 26, 2024 prepared by Gorrill Palmer
- City of Biddeford Zoning Ordinance

Background

Westbrook Development Corporation is currently seeking approval from the City of Biddeford Planning Board for the construction of two (2) new multi-family buildings; (1) 36-unit senior building and (1) 40-unit family building. The project site is approximately 3.64 acres as identified on the City of Biddeford's Assessor's Office Tax Map 2/Lot 42. The site is currently owned by the City of Biddeford. The subject lot was created and identified as Lot #1 in a City of Biddeford subdivision which was created in 1999 and received a MeDEP SLDA permit at that time. The existing SLDA permit for the subdivision permitted 76,302SF of lot coverage and 1,316SF of wetland impact. Additionally, Section 61 of the City of Biddeford Performance Standards require that stormwater management evaluations and design be based on a 24-hr, 25-year occurrence interval storm.

The project site is currently occupied by a Maine Water Company pump station at the southeast corner of the lot with an existing paved entrance. A City of Biddeford sewer easement is maintained as a grassed area that travels longitudinally through the site. A storm water attenuation and water quality pond designed and constructed as part of the 1999 subdivision is located in the northwest corner of the lot. The

pond was designed using MeDEP "Stormwater Management for Maine: Best Management Practices" from 1997 and exceeded the TSS removal required at the time of permitting under 06-096 CMR Chapter 500. The total existing impervious area is 7,676 SF which consists of the Maine Water pump station and a paved entrance to the lot. The remainder of the site is undeveloped with a combination of wetlands, fields, and shrubby vegetated areas.

Soil data for the project site from the high intensity soil survey conducted for the original subdivision plans identifies the site soils to be comprised of:

TABLE 1 – OVERVIEW OF EXISTING SOIL TYPES		
Soil Description	Map Symbol	Hydrologic Soil Group
Lamoine, 3-8% Slopes	LAB	D
Lamoine, 8-15% Slopes	LAC	D
Turnbridge-Lyman-Rock Outcrop, 3-8% Slopes	T-L-R C	C/D
Scantic, 0-3% Slopes	SCA	D

Analysis

The proposed project will generate 20,519 SF building area with parking and sidewalks for a total of 69,066 SF (1.59 acres) of impervious area. As noted previously, the allotted impervious area and wetland impacts for this property within the existing SLDA Permit were 76,302SF and 1,316SF, respectively. We find the proposed impervious area is less than that previously permitted. The wetland impacts previously permitted were executed as part of the Barra Road and driveway construction, therefore, no further wetland impacts may be incurred without additional permitting through the MeDEP. Accordingly, the current design proposes no wetland impacts.

The table below presents the original lot area/development characteristics designed for the subject parcel. This included the development of approximately 2.19 acres of developed area and 1.86 acres of impervious area. The prior approvals resulted in the design and construction of a wet pond in the northwest corner of the lot. The following table compares the permitted amounts allotted for lot #1 in the MeDEP SLDA Permit with the proposed amounts generated by the project.

TABLE 2 – COMPARISON OF PERMITTED AND PROPOSED DEVELOPMENT AREAS				
Condition	Total Lot Area (Acres)	Total Development Area (Acres)	Total Impervious Area (Acres)	Total Wetland Impact (Acres)
Original SLDA Permit	3.65	2.19	1.86	0.03
Proposed	3.65	2.14	1.59	0.00

A comparison of the predevelopment and post development flows as modeled for the MeDEP Site Location Permit for Exit 4 Business Park is detailed below. The model divided the area of the business park into two larger subbasins for the predevelopment condition and a variety of smaller subbasins for

the post-development condition. Table 2 shows the effects of development on Thatcher Brook assuming the permitted amounts of impervious surface for all lots in the business park.

TABLE 3 – COMPARISON OF PERMITTED AND PROPOSED DEVELOPMENT AREAS				
Storm Event	Predev. Peak Runoff Flow Rate (cfs)	Postdev. Peak Flow Rate (cfs)	Flow Change (cfs)	% Change
2 Year	195.6	195.6	0.0	0%
10 Year	379.9	378.1	-1.8	-0.05%
25 Year	469.9	466.3	-3.6	-0.08%
100 Year	608.0	601.5	-6.5	-1.1%

The proposed stormwater system will utilize a series of storm drains and pipes in conjunction with the previously constructed storm water pond. The perimeter areas and fill slopes will be planted with wildflower seed mix and left unmaintained/undeveloped. Storm water will be collected and transported moving roughly east to west with an outfall located at the existing storm water pond. As required by § 61A.3 of the City of Biddeford Performance Standards, the system was designed for a 25-year storm, 24-hour duration storm. Storm data was obtained from the Cornell "Extreme Precipitation in New York & New England" tool as referenced in Appendix A-1 of the Maine Stormwater Management Design Manual, published May 2016. Preliminary pipe sizes for the proposed developed area were determined from flows modeled using a SCS TR-55 model within Autodesk Storm and Sanitary Analysis. The pipe sizes as well as their design and anticipated flows are attached with this memo.

Conclusion

The proposed stormwater and drainage design maintains an overall impervious and development area below or equal to the designated thresholds for the site and utilizes the existing pond designed and constructed as part of the original business park development. Additionally, the project also does not intend to generate any additional wetland impacts. The onsite drainage infrastructure which conveys runoff to the existing pond has been sized for the 25-year storm to meet performance standards set by the City of Biddeford. Based on the information provided, we conclude the stormwater management for the property will be sufficiently handled per the original design to provide water quality and quantity treatment. It is therefore anticipated that the project will remain in compliance with the permit requirements as outlined in the MeDEP Site Law permit and the City's standards for water quantity treatment.

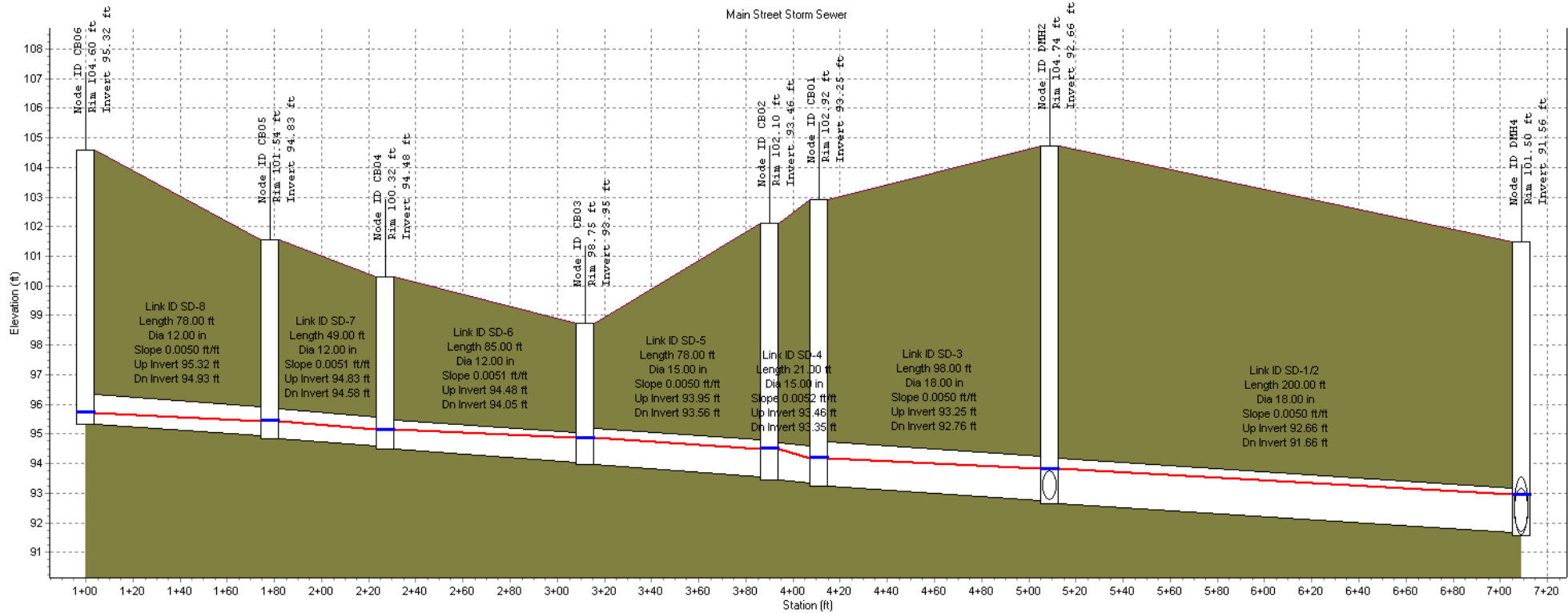
Attachments: Pipe Capacity Calcs & Storm Drain Profiles

u:\4303_wha barra road development_biddeford,me\p applications\local\final site & subdivision\attachments\attachment g - stormwater management report\4303-stormwater-memo-jmc-cobranded.docx

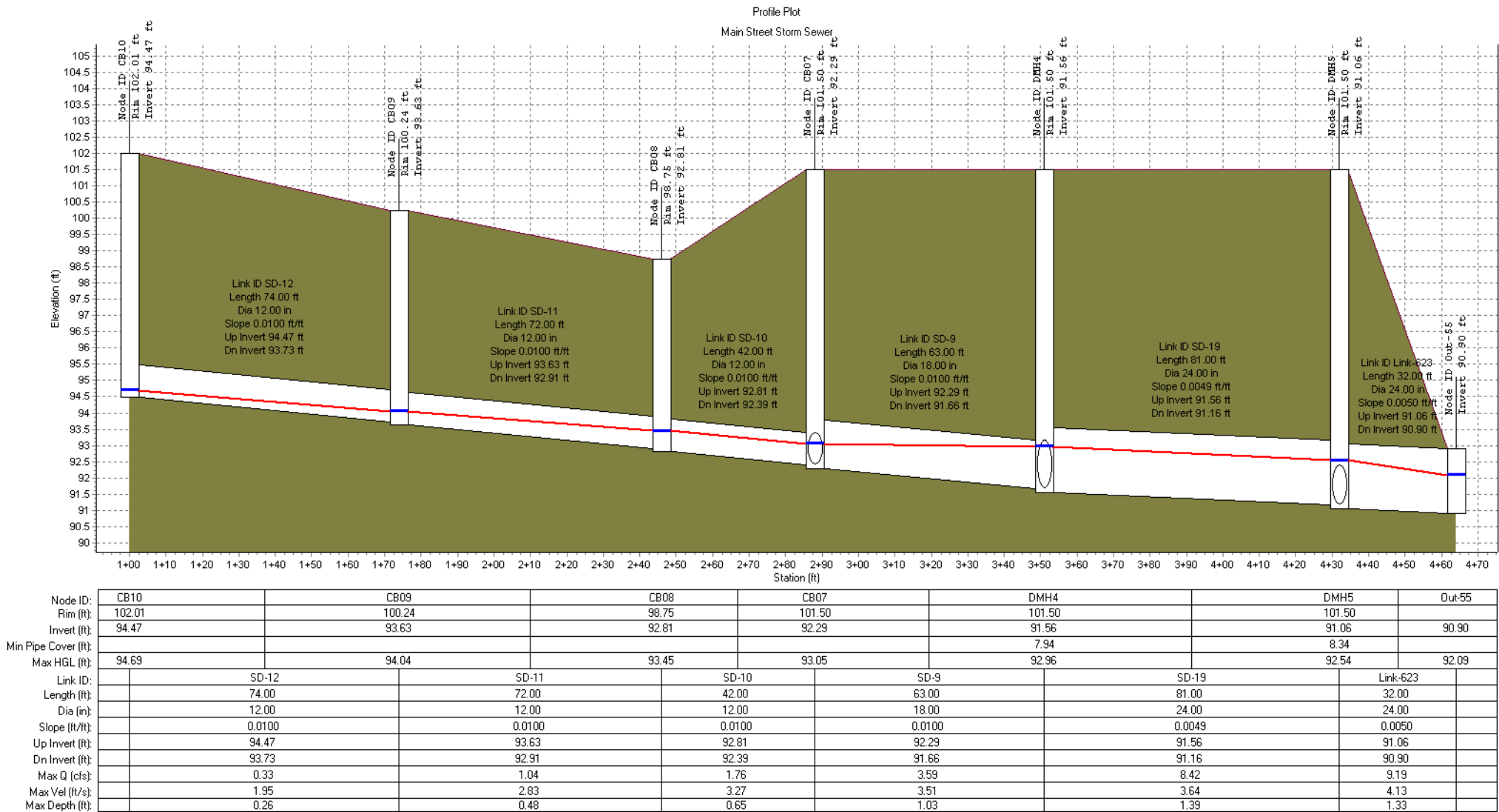
Link Summary

SN	Element	Element	From	To (Outlet)	Length	Inlet	Outlet	Average	Diameter or	Manning's	Peak	Design Flow	Peak Flow/	Peak Flow	Peak Flow	Peak Flow	Total Time	Reported
ID	Type		(Inlet)	Node		Invert	Invert	Slope	Height	Roughness	Flow	Capacity	Design Flow/	Velocity	Depth	Depth/	Surcharged	Condition
			Node			Elevation	Elevation						Ratio			Total Depth		
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)	Ratio		(min)
1	SD-2	Pipe	DMH2	DMH4	200.00	92.66	91.66	0.5000	18.000	0.0150	5.39	6.44	0.84	3.48	1.23	0.82	0.00	Calculated
2	SD-10	Pipe	CB08	CB07	42.00	92.81	92.39	1.0000	12.000	0.0150	1.76	3.09	0.57	3.27	0.65	0.65	0.00	Calculated
3	SD-11	Pipe	CB09	CB08	72.00	93.63	92.91	1.0000	12.000	0.0150	1.04	3.09	0.34	2.83	0.48	0.48	0.00	Calculated
4	SD-12	Pipe	CB10	CB09	74.00	94.47	93.73	1.0000	12.000	0.0150	0.33	3.09	0.11	1.95	0.26	0.27	0.00	Calculated
5	SD-13	Pipe	CB11	CB07	84.00	93.23	92.39	1.0000	12.000	0.0150	0.78	3.09	0.25	2.05	0.50	0.50	0.00	Calculated
6	SD-14	Pipe	DMH3	DMH2	80.00	93.56	92.76	1.0000	12.000	0.0150	2.03	3.09	0.66	3.23	0.80	0.80	0.00	Calculated
7	SD-15	Pipe	DMH5	Outfall	32.00	91.06	90.90	0.5000	24.000	0.0150	9.19	13.86	0.66	4.13	1.33	0.67	0.00	Calculated
8	SD-16	Pipe	CB-14	DMH3	40.00	94.06	93.66	1.0000	12.000	0.0150	1.30	3.09	0.42	3.19	0.52	0.52	0.00	Calculated
9	SD-17	Pipe	CB-13	DMH3	18.00	93.84	93.66	1.0000	12.000	0.0150	0.78	3.09	0.25	2.30	0.47	0.47	0.00	Calculated
10	SD-18	Pipe	CB-12	DMH5	42.00	91.58	91.16	1.0000	15.000	0.0150	0.96	5.60	0.17	2.55	1.11	0.89	0.00	Calculated
11	SD-19	Pipe	DMH4	DMH5	81.00	91.56	91.16	0.4900	24.000	0.0150	8.42	13.78	0.61	3.64	1.39	0.69	0.00	Calculated
12	SD-3	Pipe	CB01	DMH2	98.00	93.25	92.76	0.5000	18.000	0.0150	3.74	6.44	0.58	3.12	0.99	0.66	0.00	Calculated
13	SD-4	Pipe	CB02	CB01	21.00	93.46	93.35	0.5200	15.000	0.0150	3.22	4.05	0.80	3.28	0.93	0.75	0.00	Calculated
14	SD-5	Pipe	CB03	CB02	78.00	93.95	93.56	0.5000	15.000	0.0150	2.80	3.96	0.71	2.92	0.92	0.74	0.00	Calculated
15	SD-6	Pipe	CB04	CB03	85.00	94.48	94.05	0.5100	12.000	0.0150	1.43	2.20	0.65	2.34	0.73	0.73	0.00	Calculated
16	SD-7	Pipe	CB05	CB04	49.00	94.83	94.58	0.5100	12.000	0.0150	1.22	2.21	0.56	2.67	0.58	0.58	0.00	Calculated
17	SD-8	Pipe	CB06	CB05	78.00	95.32	94.93	0.5000	12.000	0.0150	0.68	2.18	0.31	2.03	0.45	0.45	0.00	Calculated
18	SD-9	Pipe	CB07	DMH4	63.00	92.29	91.66	1.0000	12.000	0.0150	3.59	9.10	0.39	3.51	1.03	0.69	0.00	Calculated

Profile Plot
Main Street Storm Sewer



Node ID:	CB06	CB05	CB04	CB03	CB02	CB01	DMH2	DMH4
Rim (ft):	104.60	101.54	100.32	98.75	102.10	102.92	104.74	101.50
Invert (ft):	95.32	94.83	94.48	93.95	93.46	93.25	92.66	91.56
Min Pipe Cover (ft):							10.48	7.94
Max HGL (ft):	95.71	95.43	95.14	94.86	94.49	94.19	93.82	92.95
Link ID:	SD-8	SD-7	SD-6	SD-5	SD-4	SD-3	SD-1/2	
Length (ft):	78.00	49.00	85.00	78.00	21.00	98.00	200.00	
Dia (in):	12.00	12.00	12.00	15.00	15.00	18.00	18.00	
Slope (ft/ft):	0.0050	0.0051	0.0051	0.0050	0.0052	0.0050	0.0050	
Up Invert (ft):	95.32	94.83	94.48	93.95	93.46	93.25	92.66	
Dn Invert (ft):	94.93	94.58	94.05	93.56	93.35	92.76	91.66	
Max Q (cfs):	0.68	1.22	1.43	2.80	3.22	3.74	5.39	
Max Vel (ft/s):	2.03	2.67	2.34	2.92	3.28	3.11	3.49	
Max Depth (ft):	0.45	0.58	0.73	0.92	0.93	0.99	1.22	



ATTACHMENT H

MEMORANDUM
TRAFFIC EVALUATION
BARRA ROAD DEVELOPMENT
BIDDEFORD, ME
June 24, 2024

INTRODUCTION

Per the request of Kaplan Thompson Architects, Gorrill Palmer (GP) has calculated and evaluated specific traffic information regarding a potential development including affordable senior apartments (36 units) and affordable family apartments (40 units). The current site is partially developed with an existing driveway and booster pump station. The site is located north of Bolduc Eye Care, south of Holiday Inn Express, west of Barra Road, and east of undeveloped land. The purpose of this memorandum is to provide the applicant with a traffic evaluation that can be submitted to the City of Biddeford. The City of Biddeford Ordinance provides the following guidance regarding traffic: Article VI. Performance Standards, Section 62. Studies and impact / development fees, C.

“..., the Board may require additional studies and reports when there is reason to believe that a given project may have unreasonable or adverse impact on a given neighborhood or the community as a whole.”

If a traffic study is required under C.1.a, -

“Traffic study: To be completed by a traffic engineer; this study shall report the possible impact that a given project may have on the City's roadways. Besides meeting the standards established for professionally completed reports, this study shall include local traffic accident information for the last five years prior to development.”

As part of this traffic evaluation, we have reviewed/evaluated the following;

- Trip Generation
- Safety Review: 3-year & 5-year
- Sight Distance Review

The following summarizes the data and information used, the methodology, and the results of the evaluation.

TRIP GENERATION

Trip generation for the affordable senior apartments (36 units) and affordable family apartments (40 units) have been calculated using the Institute of Transportation Engineers' (ITE) publication, *Trip Generation*, 11th Edition, the most recent edition accepted by MaineDOT. After



careful review of the Land Use Codes (LUCs) provided in the 11th Edition of *Trip Generation*, the following land use codes were used to calculate the trip generation for the proposed development:

Proposed Trip Generation

- LUC 221 – Multifamily Housing (Mid-Rise) – Not Close to Rail Transit – 40 units
- LUC 252 – Senior Adult Housing – Multifamily – 36 units

In calculating trip generation, MaineDOT methodology requires review of both the average rate and the fitted curve equation. If $r^2 \geq 0.80$ then the fitted curve equation is typically used, and if $r^2 < 0.80$ then the average rate is typically used. Trip generation calculations are provided in Attachment I.

The following Table I summarizes the trip generation for multifamily housing (mid-rise).

Table I – Trip Generation (LUC 221 – 40 Units)

Time Period	Trip Generation (Trip Ends)	
	Trip Gen Rates	Trip Generation
Weekday*	3.60	144
AM Peak Hour of Adjacent Street*	0.15	6
PM Peak Hour of Adjacent Street	0.40	16
AM Peak Hour Generator	0.48	19
PM Peak Hour Generator*	0.70	28
Saturday Peak Hour Generator*	0.40	16

*Rates based on using fitted curve equation.

As can be seen in Table I, the multifamily housing (mid-rise) is forecast to generate 6 and 16 trips during the AM and PM peak hours of adjacent street respectively.

The following Table 2 summarizes the trip generation for senior adult housing – multifamily.

Table 2 – Trip Generation (LUC 252 – 36 Units)

Time Period	Trip Generation (Trip Ends)	
	Trip Gen Rates	Trip Generation
Weekday*	3.58	129
AM Peak Hour of Adjacent Street*	0.22	8
PM Peak Hour of Adjacent Street	0.25	9
AM Peak Hour Generator	0.42	15
PM Peak Hour Generator*	0.31	11
Saturday Peak Hour Generator*	0.33	12



*Rates based on using fitted curve equation.

As can be seen in Table 2, the senior adult housing – multifamily is forecast to generate 8 and 9 trip ends during the AM and PM peak hours of adjacent street respectively.

The following Table 3 summarizes the trip generation for both apartment complexes.

Table 3 – Trip Generation Both Apartment Complexes

Time Period	Trip Generation (Trip Ends)
Weekday	273
AM Peak Hour of Adjacent Street	14
PM Peak Hour of Adjacent Street	25
AM Peak Hour Generator	34
PM Peak Hour Generator	39
Saturday Peak Hour Generator	28

As can be seen in Table 3, both apartment complexes together are forecast to generate 14 and 25 trip ends during the AM and PM peak hours of adjacent street respectively.

The trip generation threshold for requiring a MaineDOT Traffic Movement Permit is 100 or more trip ends during any peak hour of any day. After reviewing the trip generation in Table 3, the combined peak hours do not exceed 100+ trip ends. Therefore, this development does not require a MaineDOT Traffic Movement Permit and will be solely reviewed by the City.

The following Table 4 summarizes the trip distribution for multifamily housing (mid-rise) based on the ITE Trip Generation Manual, 11th Edition.

Table 4 – Trip Distribution (LUC 221)

Time Period	Trip Ends		
	Enter	Exit	Total
Weekday	72	72	144
AM Peak Hour of Adjacent Street	1	5	6
PM Peak Hour of Adjacent Street	10	6	16
AM Peak Hour Generator	5	14	19
PM Peak Hour Generator	17	11	28
Saturday Peak Hour	8	8	16

The following Table 5 summarizes the trip distribution for senior adult housing – multifamily based on the ITE Trip Generation Manual, 11th Edition.



Table 5 – Trip Distribution (LUC 252)

Time Period	Trip Ends		
	Enter	Exit	Total
Weekday	65	64	129
AM Peak Hour of Adjacent Street	3	5	8
PM Peak Hour of Adjacent Street	5	4	9
AM Peak Hour Generator	7	8	15
PM Peak Hour Generator	6	5	11
Saturday Peak Hour	6	6	12

The following Table 6 summarizes the combined trip distribution for the multifamily housing (mid-rise) and senior adult housing – multifamily based on the ITE Trip Generation Manual, 11th Edition.

Table 6 – Trip Distribution (LUC 252)

Time Period	Trip Ends		
	Enter	Exit	Total
Weekday	137	136	273
AM Peak Hour of Adjacent Street	4	10	14
PM Peak Hour of Adjacent Street	15	10	25
AM Peak Hour Generator	12	22	34
PM Peak Hour Generator	23	16	39
Saturday Peak Hour	14	14	28

SAFETY REVIEW

For the safety review, GP reviewed both a three-year crash history (2021-2023) and a five-year crash history (2019-2023) (Supporting information provided in Attachment B). The following identifies each evaluation in more detail:

Three-year crash history:

The three-year crash history was reviewed because this is the criteria used by MaineDOT to identify a location as a high crash location. HCL criteria is discussed in more detail as follows:

To evaluate whether a location has a crash problem, MaineDOT uses two criteria to define a High Crash Location (HCL). Both criteria must be met to be classified as an HCL.



1. A critical rate factor (CRF) of 1.00 or more for a three-year period. A CRF compares the actual crash rate to the rate for similar intersections in the state. A CRF of less than 1.00 indicates a rate of less than average **and**:
2. A minimum of eight crashes over the same three-year period.

A safety review was completed for Barra Road and the immediate area around the Barra Road / Alfred Street / West Cole Road intersection. The following summarizes those locations that met at least one of the above MaineDOT criteria.

Table 7 – Potential HCL Locations (3 year history)

Node	Location	Number of Crashes	Critical Rate Factor	HCL?
59168	Barra Road	1	1.76	No
59159	Alfred Street @ Barra Road / W Cole Road	34	1.25	Yes

As shown in Table 7, there is one location that meets the definition of a HCL (Node 59159). To identify potential mitigation, the collision diagram (Attachment B) was reviewed for potential crash patterns, which is typically considered three or more similar crashes. Based on a review of the collision diagram, there appear to be four crash patterns as follows:

- Alfred Street northbound rear-end (3 crashes)
- Alfred Street northbound angle crashes with southbound left turning traffic (3 crashes)
- Alfred Street southbound rear-end (11 crashes)
- Alfred Street southbound angle crashes with northbound left turning traffic (7 crashes)

Left turn angle crashes: Alfred Street left turning vehicles appear to have both a permissive & protected phase. This means that at some point in the signal cycle, the left turns can make a permissive left turn opposing two through lanes. This type of movement is discouraged by the MaineDOT because it has been shown to create these types of crash patterns, and only protected left turns are allowed when opposing two through lanes. It is our understanding that this intersection is part of a larger coordinated signal system along Alfred Street, and as such, any changes to timing and/or phasing will require evaluation of the entire system. In our opinion, this signal evaluation would be beyond the responsibility of this project given the minimal trip generation and impact this project will have on the intersection.

Rear-end crashes: The rear-end crashes could be a result of inadequate timing of the yellow and/or all red times for the through traffic. As identified in the previous “Left turn angle crashes” section, the timing and/or phasing of this intersection should not be changed unless the entire Alfred Street coordinated signal system is reviewed. It is our understanding that this intersection is part of a larger coordinated signal system along Alfred Street, and as such, any



changes to timing and/or phasing will require evaluation of the entire system. In our opinion, this signal evaluation would be beyond the responsibility of this project given the minimal trip generation and impact this project will have on the intersection.

Five-year crash history:

Per Biddeford City Ordinance, the five-year crash history was also reviewed. The following Table 8 summarizes the crash history for the same location identified as a HCL in the previous section for three-year review.

Table 8 – Five Year Crash History of Signalized Intersection

Node	Location	Number of Crashes	Critical Rate Factor
59159	Alfred Street @ Barra Road / W Cole Road	54	1.29

Based on the information in Table 8, the five-year crash history confirms the signalized intersection has historically had challenges when it comes to safety.

Pedestrian & Bicycle Crashes:

In addition to a review of the three & five-year crash histories, GP reviewed the latest three-year history to identify if there were reportable pedestrian or bicycle crashes. Based on information provided on the Maine Public Crash Query Tool, there were no reported bicycle crashes within the anticipated study area for the 2021-2023 time period. There was one reported pedestrian crash at the intersection of Alfred Street / Barra Road / W Cole Road. This crash occurred on 5/23/22 at 4:00 PM and was a non-fatal crash.

SIGHT DISTANCE REVIEW

The existing site currently has separate access driveway and fire truck access onto Barra Road. Gorrill Palmer completed a site visit on 6/20/2024 to evaluate sight distances for the proposed driveways. The City of Biddeford and MaineDOT have different standards for sight distance. The table below presents the standard distances for the City of Biddeford and MaineDOT.



Table 9 – MaineDOT Standards for Sight Distance

Speed Limit (mph)	MaineDOT Required (ft)	City of Biddeford (ft)
25	200	250
30	250	300
35	305	350
40	360	400
45	425	450

Since the City of Biddeford requirements for sight distance are greater than MaineDOT, the City of Biddeford criteria was used for this evaluation. The City of Biddeford and MaineDOT use the same evaluation methodology to measure sight distance. The City of Biddeford and MaineDOT method are as follows:

The City of Biddeford and MaineDOT uses the following evaluation methodology to measure sight distance:

Driveway Observation Point:	10 feet from traveled way
Height of Eye at Driveway:	3.5 feet above the ground
Height of Approaching vehicle:	4.25 feet above the ground

Based on the MaineDOT Map Viewer, Barra Road does not have a posted speed limit. In the field a speed limit of 25 mph was determined based on posted signs along Barra Road, the required sight distance for this road is 250 feet. The following Table 10 summarizes the required and measured sight distances at the existing driveway.

Table 10 – Available Sight Distance Summary

Approach	Sight Distance (ft)		
	Required for passenger vehicle (ft)	Available	
		Looking Left	Looking Right
Exiting Barra Road Driveway – (25 mph)	250	375+	375+
Fire Truck Access – (25 mph)	250	340	375+

As shown in Table 9, the available sight distances exceed required.

SUMMARY & CONCLUSIONS

Based on this evaluation we offer the following:



1. Trip Generation: The AM & PM peak hours of adjacent street are forecast to be 14 & 25 trip ends respectively.
2. Traffic Impacts: Given the relatively low trip generation, it is our opinion that the proposed development will not have an unreasonable or adverse impact on the neighborhood or community as a whole.
3. Safety Review: Based on a review of the three & five year crash history, the signalized intersection of Barra Road / Alfred Street / West Cole Road is classified as a high crash location, with four distinct crash patterns.
4. Sight Distance Review: Sight distances exceed requirements.

Attachments:

Attachment A – Trip Generation
Attachment B – Safety Review



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Attachment A

Trip Generation

Land Use: 221

Multifamily Housing (Mid-Rise)

Description

Mid-rise multifamily housing includes apartments and condominiums located in a building that has between four and 10 floors of living space. Access to individual dwelling units is through an outside building entrance, a lobby, elevator, and a set of hallways.

Multifamily housing (low-rise) (Land Use 220), multifamily housing (high-rise) (Land Use 222), off-campus student apartment (mid-rise) (Land Use 226), and mid-rise residential with ground-floor commercial (Land Use 231) are related land uses.

Land Use Subcategory

Data are presented for two subcategories for this land use: (1) not close to rail transit and (2) close to rail transit. A site is considered close to rail transit if the walking distance between the residential site entrance and the closest rail transit station entrance is ½ mile or less.

Additional Data

For the six sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.5 residents per occupied dwelling unit.

For the five sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96 percent of the total dwelling units were occupied.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

It is expected that the number of bedrooms and number of residents are likely correlated to the trips generated by a residential site. To assist in future analysis, trip generation studies of all multifamily housing should attempt to obtain information on occupancy rate and on the mix of residential unit sizes (i.e., number of units by number of bedrooms at the site complex).

The sites were surveyed in the 1990s, the 2000s, the 2010s, and the 2020s in Alberta (CAN), California, District of Columbia, Florida, Georgia, Illinois, Maryland, Massachusetts, Minnesota, Montana, New Jersey, New York, Ontario (CAN), Oregon, Utah, and Virginia.

Source Numbers

168, 188, 204, 305, 306, 321, 818, 857, 862, 866, 901, 904, 910, 949, 951, 959, 963, 964, 966, 967, 969, 970, 1004, 1014, 1022, 1023, 1025, 1031, 1032, 1035, 1047, 1056, 1057, 1058, 1071, 1076

Multifamily Housing (Mid-Rise) Not Close to Rail Transit (221)

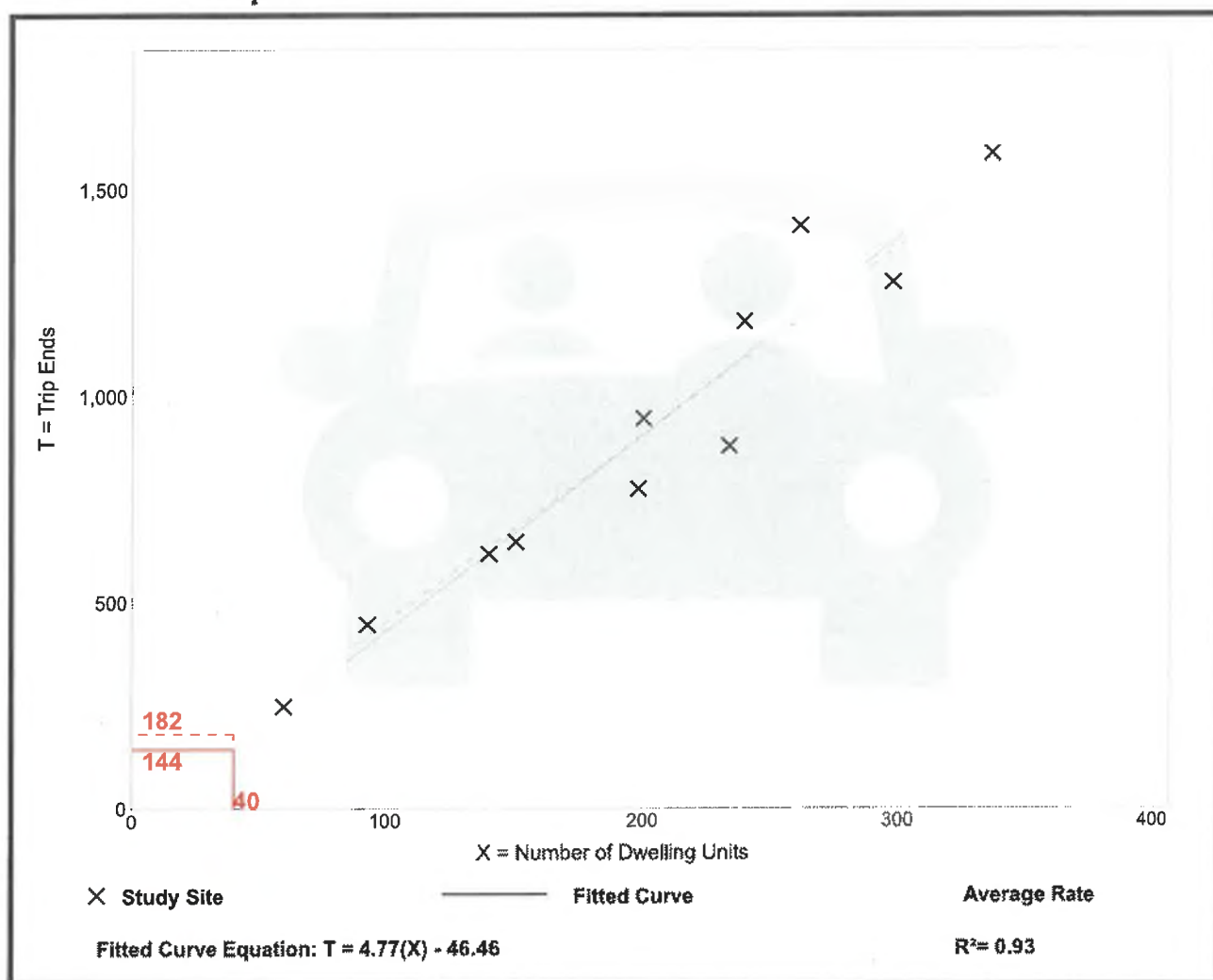
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 11
Avg. Num. of Dwelling Units: 201
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
4.54	3.76 - 5.40	0.51

Data Plot and Equation



Multifamily Housing (Mid-Rise) Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 30

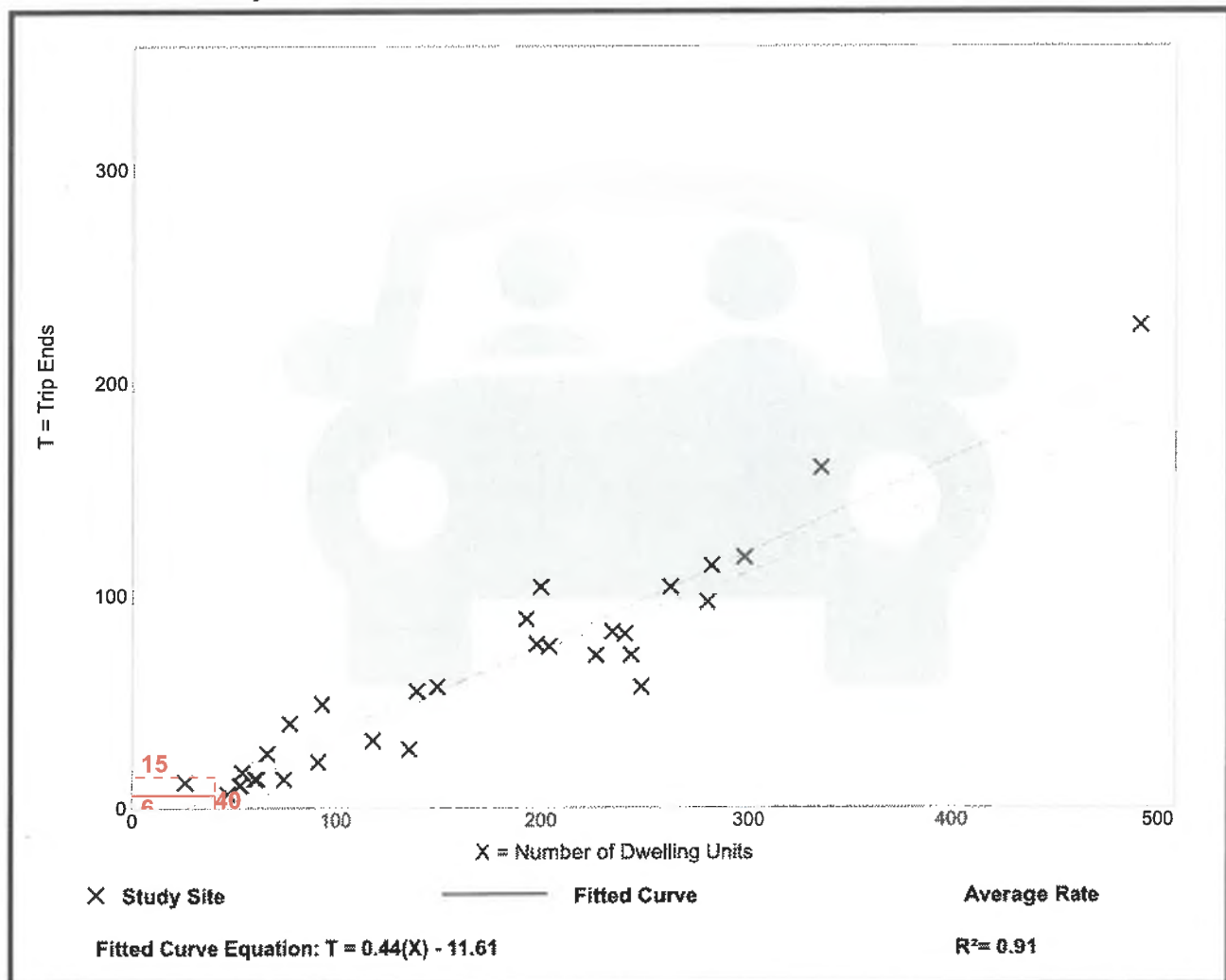
Avg. Num. of Dwelling Units: 173

Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.37	0.15 - 0.53	0.09

Data Plot and Equation



Multifamily Housing (Mid-Rise) Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 31

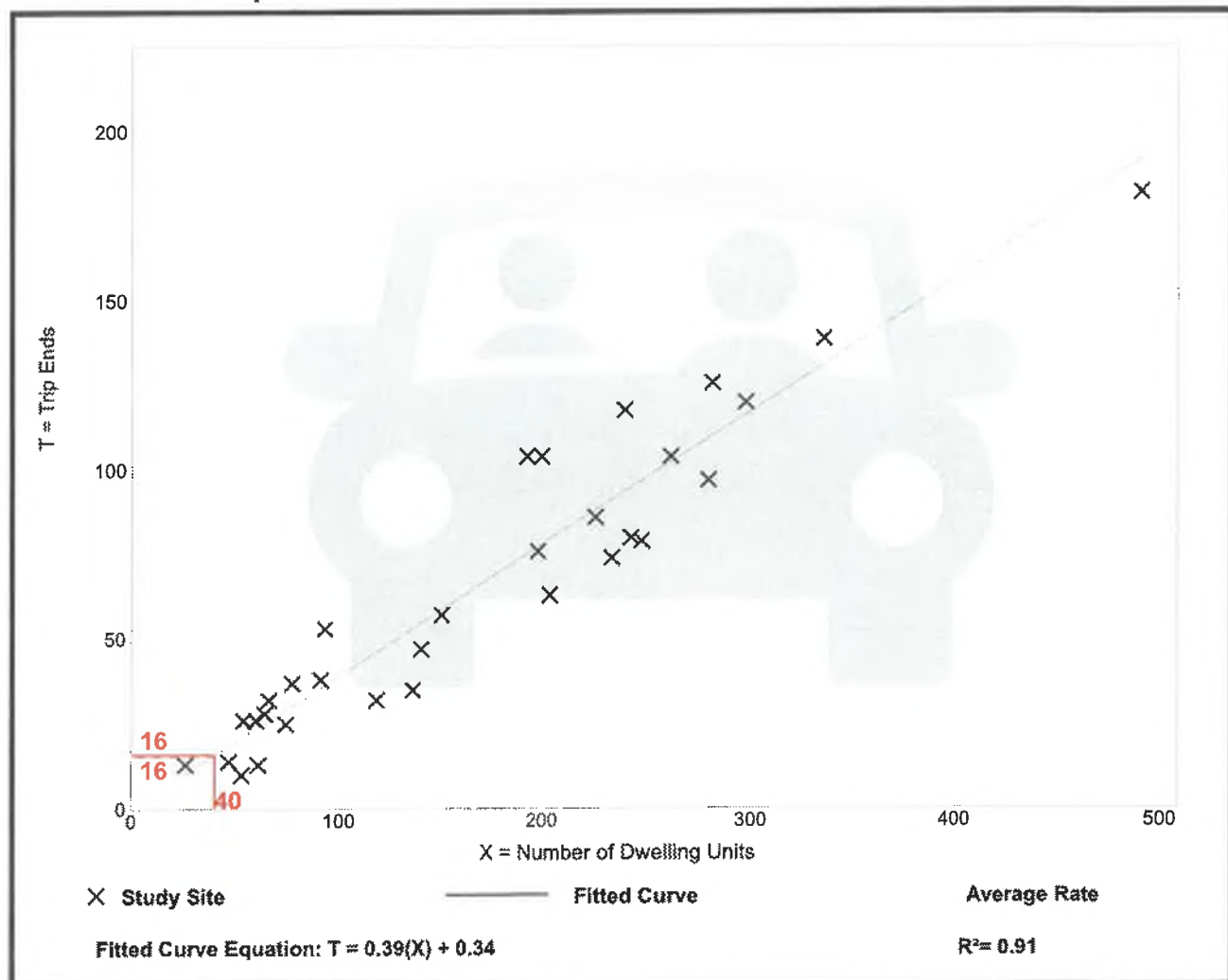
Avg. Num. of Dwelling Units: 169

Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.39	0.19 - 0.57	0.08

Data Plot and Equation



Multifamily Housing (Mid-Rise) Not Close to Rail Transit (221)

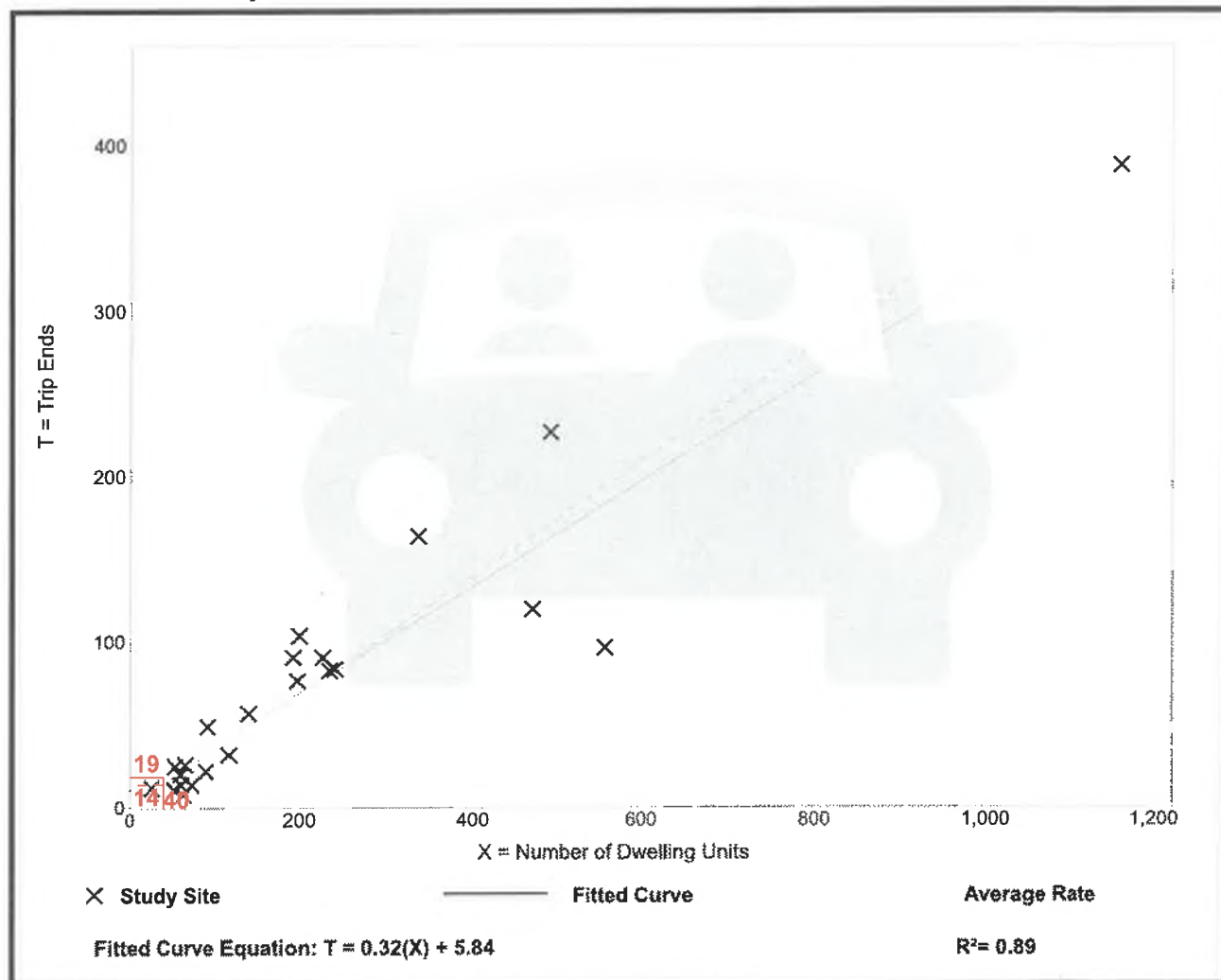
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 23
Avg. Num. of Dwelling Units: 226
Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.35	0.13 - 0.53	0.11

Data Plot and Equation



Multifamily Housing (Mid-Rise) Not Close to Rail Transit (221)

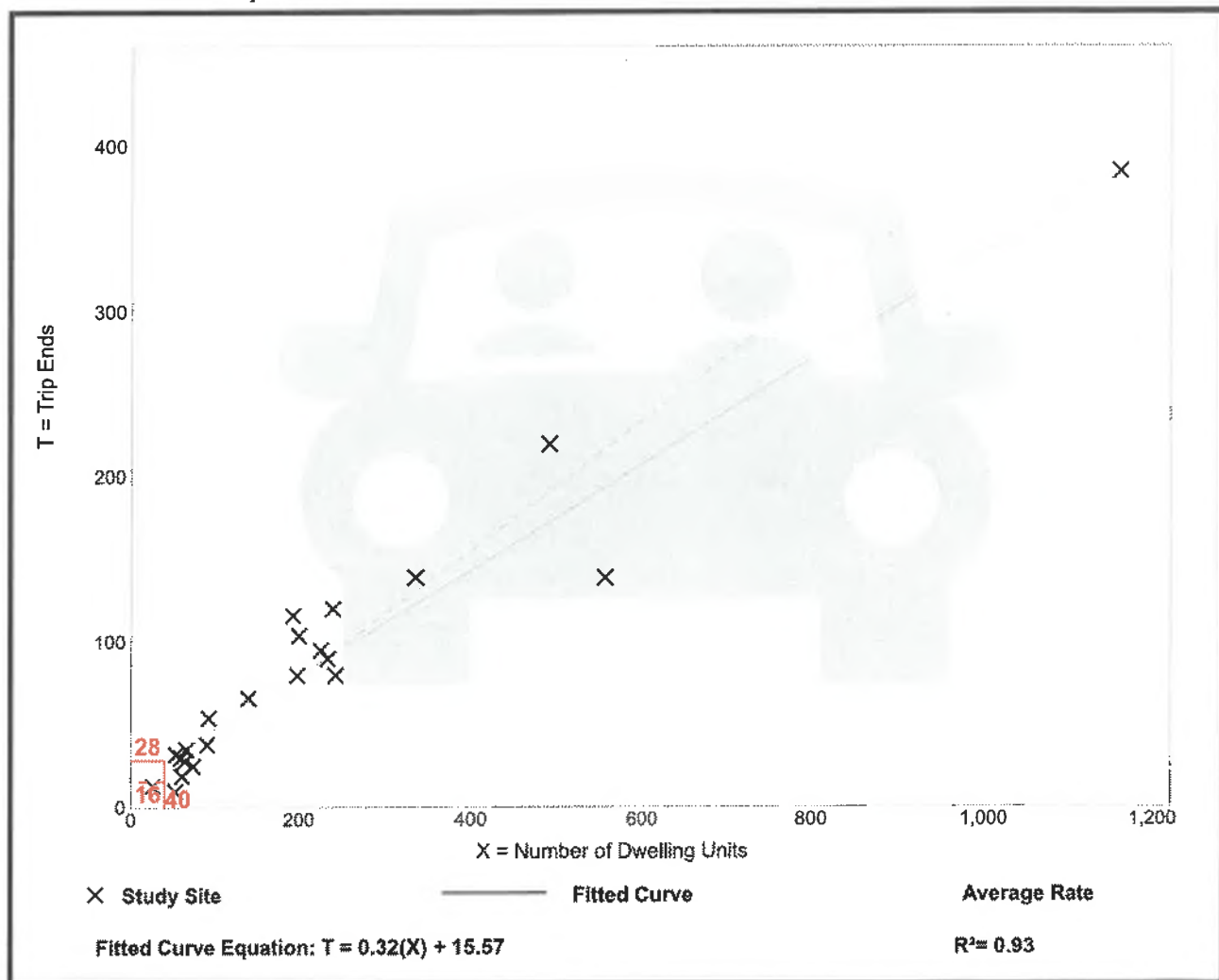
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 22
Avg. Num. of Dwelling Units: 221
Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.39	0.19 - 0.60	0.10

Data Plot and Equation



Multifamily Housing (Mid-Rise) Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Dwelling Units
On a: Saturday, Peak Hour of Generator

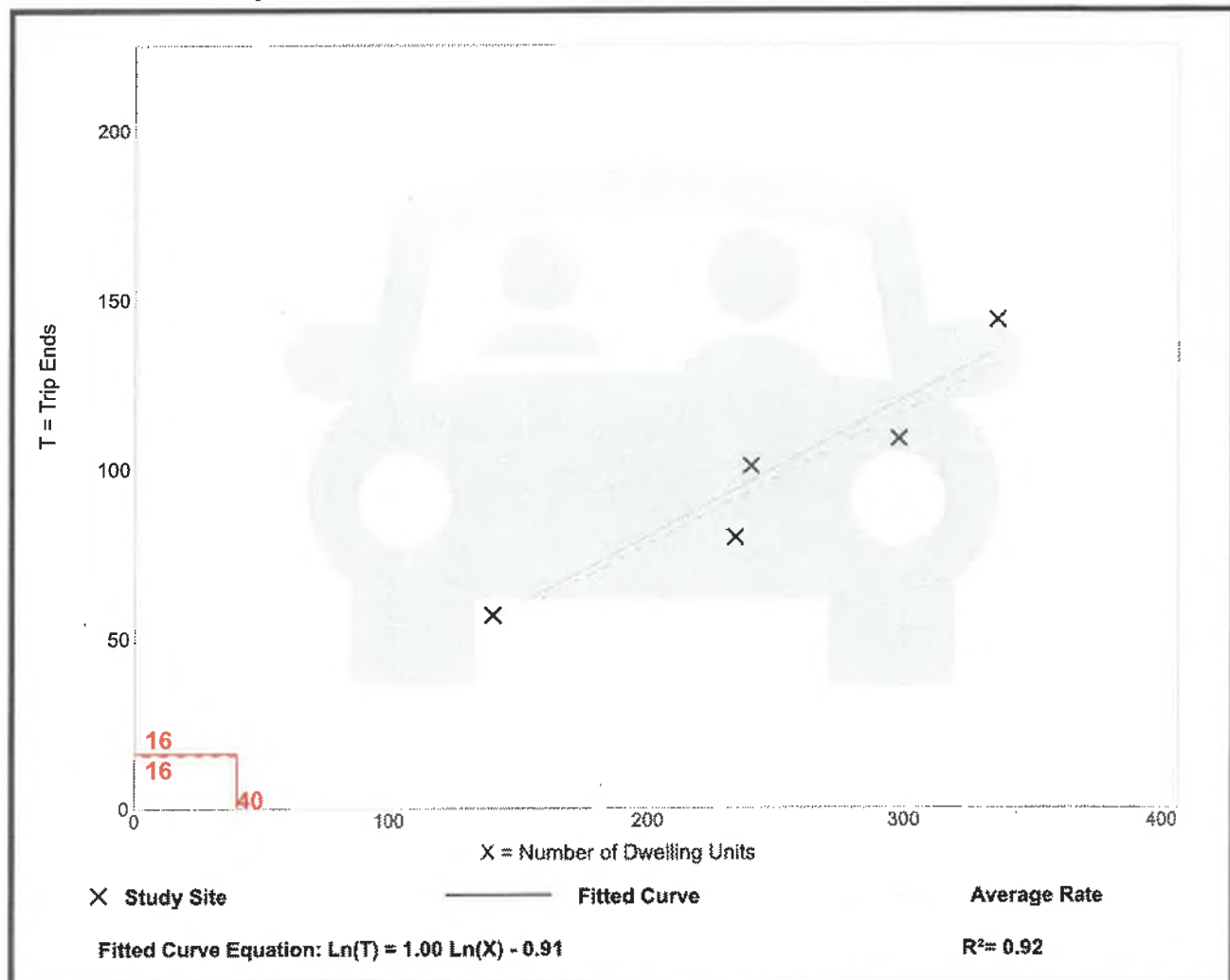
Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Dwelling Units: 250
Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.39	0.34 - 0.43	0.04

Data Plot and Equation

Caution – Small Sample Size



Land Use: 252

Senior Adult Housing—Multifamily

Description

Senior adult housing—multifamily sites are independent living developments that are called various names including retirement communities, age-restricted housing, and active adult communities. The development has a specific age restriction for its residents, typically a minimum of 55 years of age for at least one resident of the household.

Residents in these communities are typically considered active and requiring little to no medical supervision. The percentage of retired residents varies by development. The development may include amenities such as a golf course, swimming pool, 24-hour security, transportation, and common recreational facilities. They generally lack centralized dining and on-site health facilities.

The dwelling units share both floors and walls with other units in the residential building. Senior adult housing—single-family (Land Use 251), congregate care facility (Land Use 253), assisted living (Land Use 254), and continuing care retirement community (Land Use 255) are related land uses.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

The sites were surveyed in the 1980s, the 1990s, and the 2000s in Alberta (CAN), California, Maryland, New Hampshire, New Jersey, Ontario (CAN), and Pennsylvania.

Source Numbers

237, 272, 576, 703, 734, 970, 1060

Senior Adult Housing - Multifamily (252)

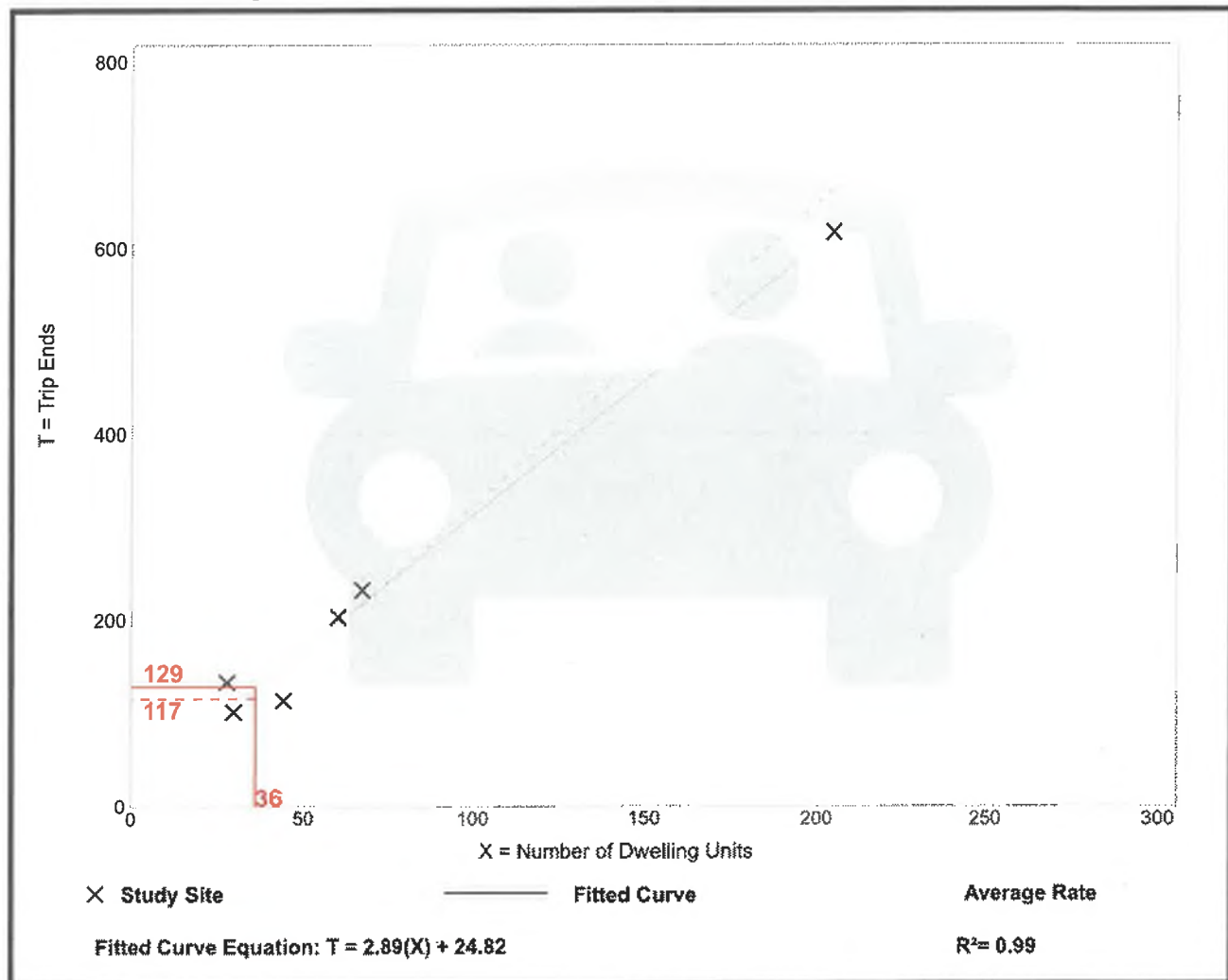
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 6
Avg. Num. of Dwelling Units: 72
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
3.24	2.59 - 4.79	0.53

Data Plot and Equation



Senior Adult Housing - Multifamily (252)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 9

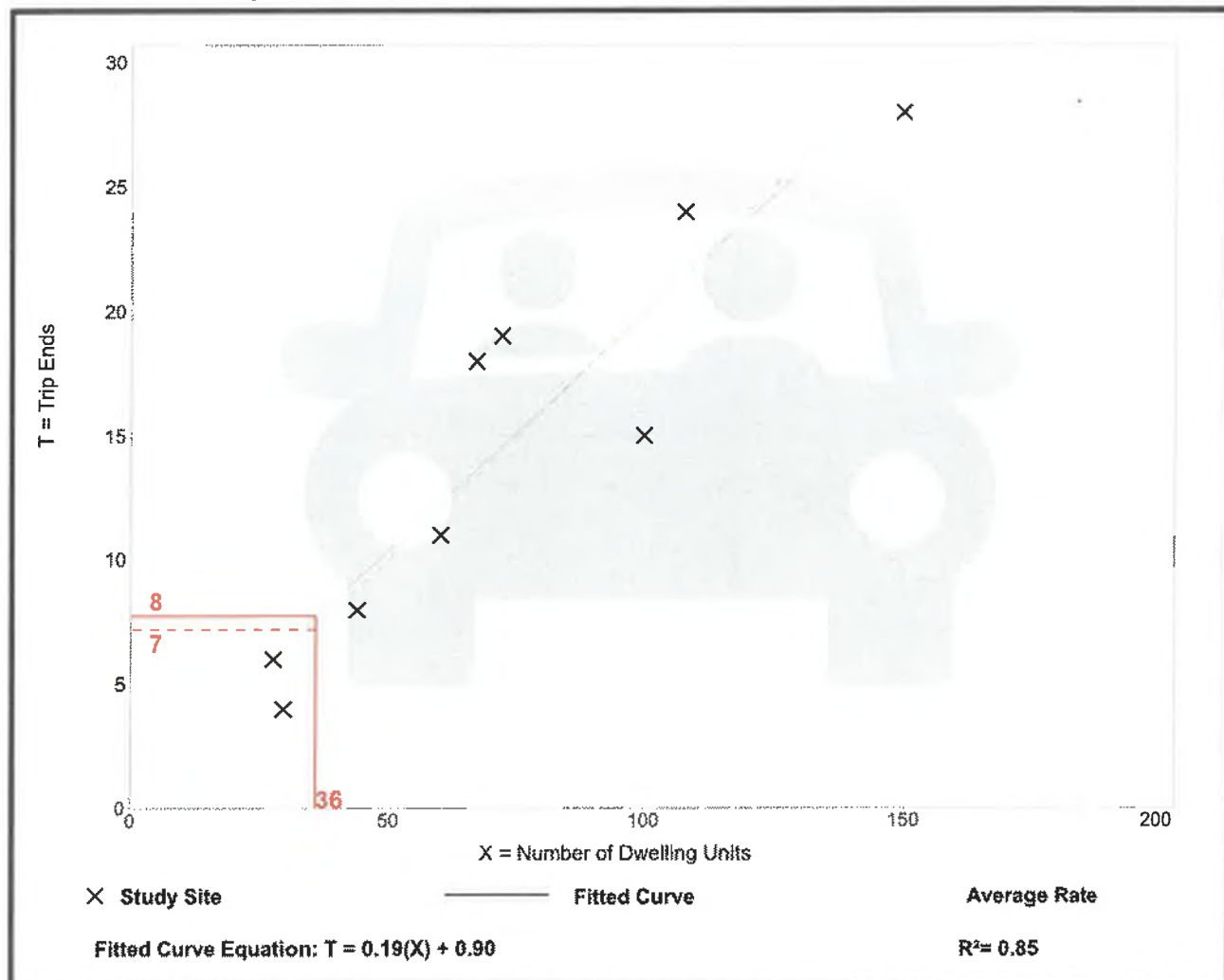
Avg. Num. of Dwelling Units: 73

Directional Distribution: 34% entering, 66% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.20	0.13 - 0.27	0.04

Data Plot and Equation



Senior Adult Housing - Multifamily (252)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 9

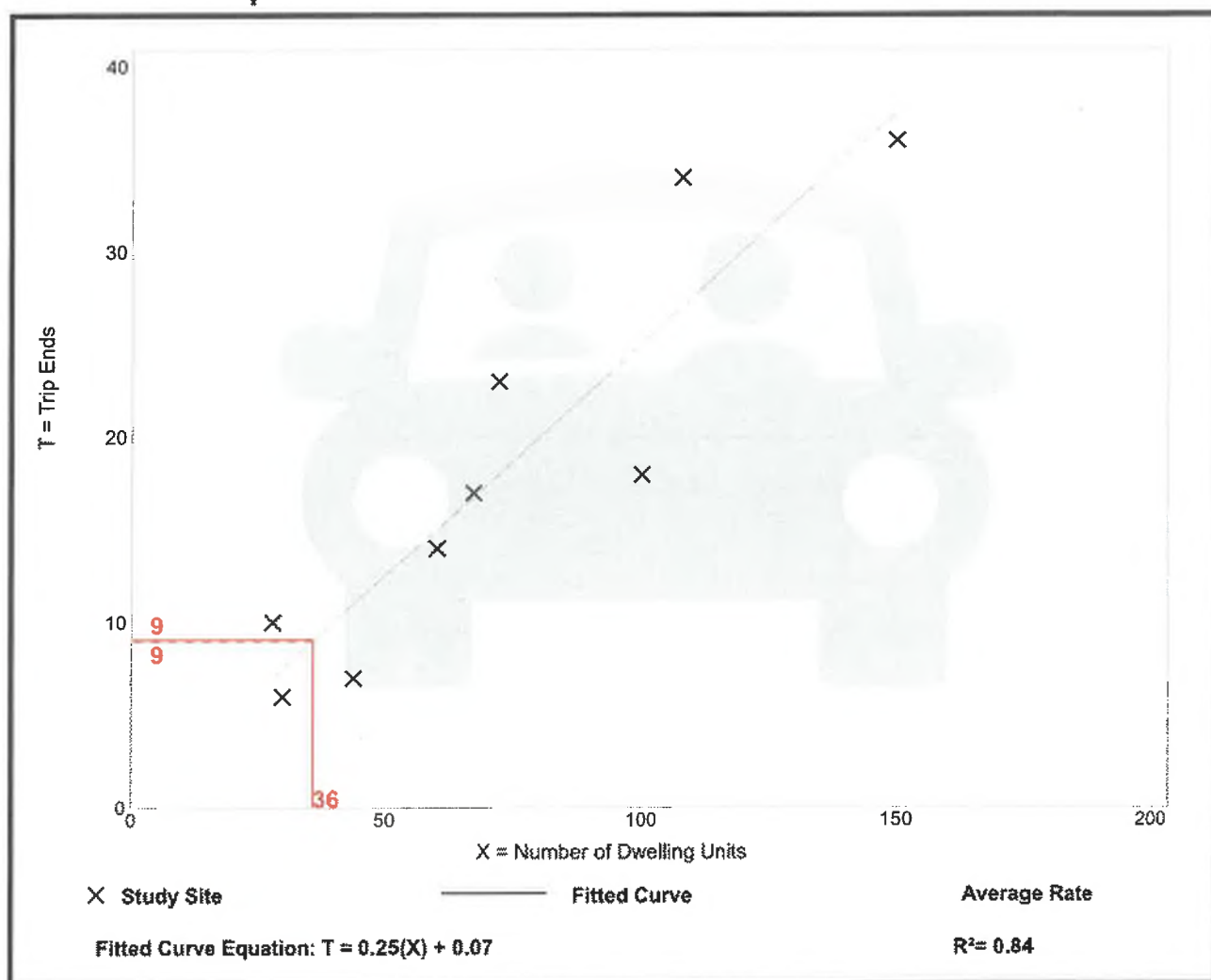
Avg. Num. of Dwelling Units: 73

Directional Distribution: 56% entering, 44% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.25	0.16 - 0.36	0.06

Data Plot and Equation



Senior Adult Housing - Multifamily (252)

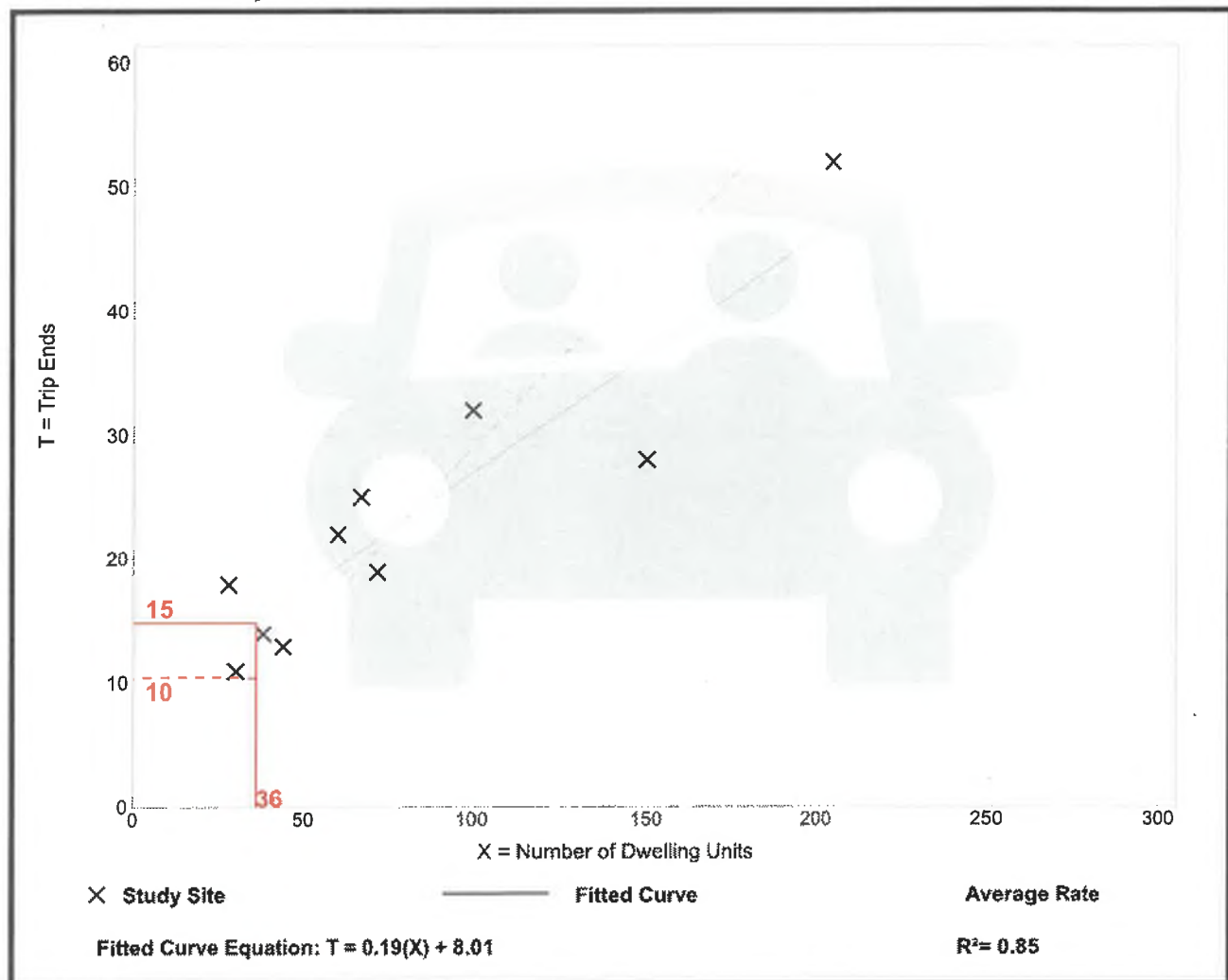
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 10
Avg. Num. of Dwelling Units: 79
Directional Distribution: 45% entering, 55% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.29	0.19 - 0.64	0.10

Data Plot and Equation



Senior Adult Housing - Multifamily (252)

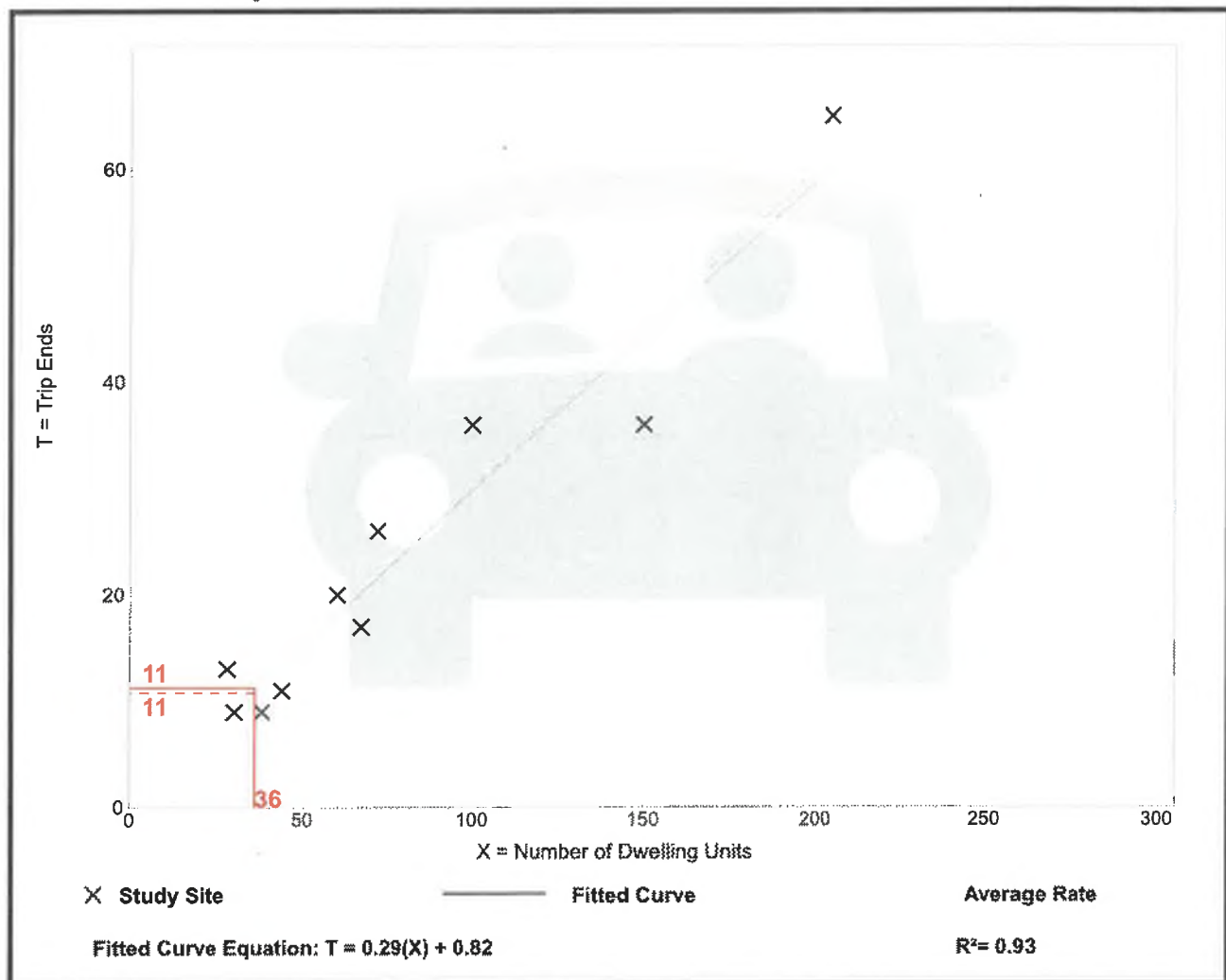
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 10
Avg. Num. of Dwelling Units: 79
Directional Distribution: 54% entering, 46% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.30	0.24 - 0.46	0.06

Data Plot and Equation



Senior Adult Housing - Multifamily (252)

Vehicle Trip Ends vs: Dwelling Units

On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 9

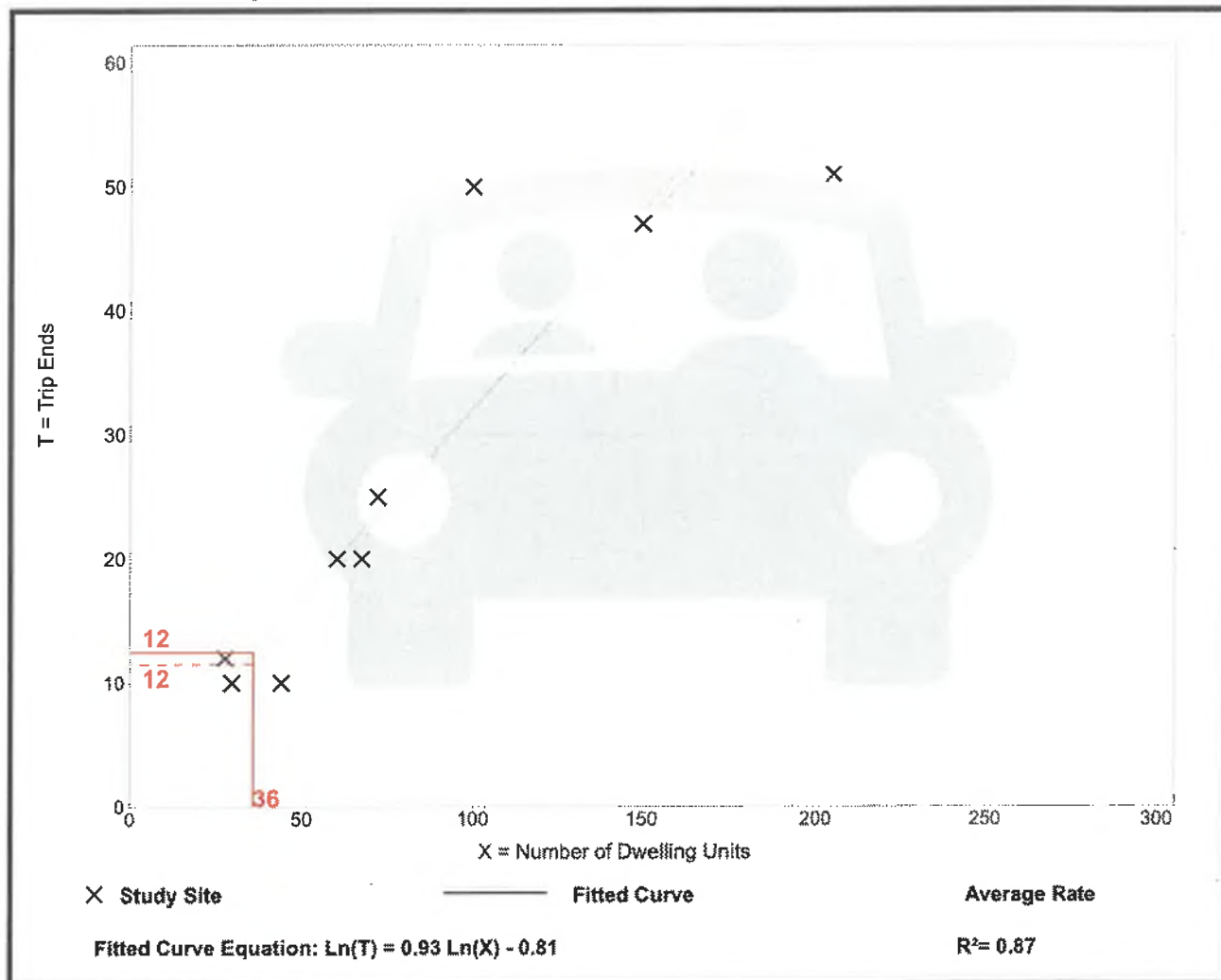
Avg. Num. of Dwelling Units: 84

Directional Distribution: 54% entering, 46% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.32	0.23 - 0.50	0.09

Data Plot and Equation





Attachment B

Safety Review

H. C. L. CRASH COLLISION DIAGRAM DATA PACKAGE

COUNTY: YORK

TOWN: BIDDEFORD

LOW NODE: 59159 HIGH NODE: 0000

REGION: 1

U/R: URBAN

DESCRIPTION: Int Alfred Rd & Barra Rd/West Cole Rd

RTE # / RD #: 0111X

DATE DRAWN: 5/10/2024 DRAWN BY: Tim

STUDY FROM: 1/1/2021

STUDY TO: 12/31/2023

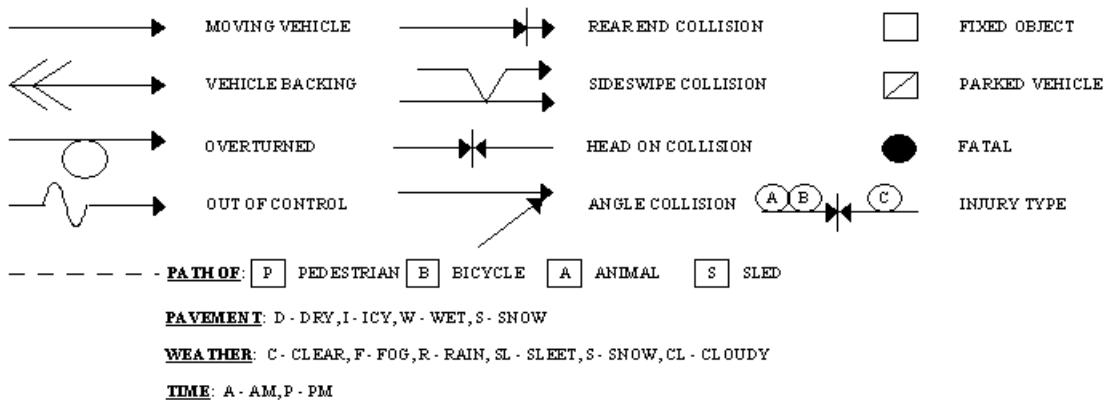
CRASH RATE: 1.41

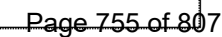
CRF: 1.25

% INJURY: 35.3

TOTAL CRASHES: 34

LEGEND







Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☒ Crash Summary I - Single Node ☐ Section Detail ☒ Crash Summary II ☐ 1320 Public ☐ 1320 Private ☐ 1320 Summary

REPORT DESCRIPTION

Biddeford
Int Alfred Rd & Barra Rd/West Cole Rd

REPORT PARAMETERS

Year 2021, Start Month 1 through Year 2023 End Month: 12

Route: **0111X** Start Node: **59159** Start Offset: **0** ☐ Exclude First Node
End Node: **59159** End Offset: **0** ☐ Exclude Last Node

Crash Summary I

Nodes																
Node	Route - MP		Node Description		U/R	Total Crashes	K	Injury A	Crashes B	Crashes C	PD	Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
59159	0111X - 2.06	Int of ALFRED ST	BARRA RD	W COLE RD	9	34	0	0	0	12	22	35.3	8.017	1.41	1.13	1.25
Statewide Crash Rate:														0.71		
Study Years:	3.00	NODE TOTALS:				34	0	0	0	12	22	35.3	8.017	1.41	1.13	1.25

Crash Summary II - Characteristics

Crashes by Day and Hour

Day Of Week	AM												PM												Un	Tot
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11		
SUNDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MONDAY	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	2	1	0	0	0	0	0	0	0	0	6
TUESDAY	0	0	0	0	0	0	0	1	0	0	1	0	1	0	2	1	0	0	1	0	0	0	0	0	0	7
WEDNESDAY	0	0	0	0	0	0	0	1	0	1	0	1	0	2	0	1	1	0	0	0	0	0	0	0	0	7
THURSDAY	0	0	0	0	0	0	0	0	0	1	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	4
FRIDAY	0	0	0	0	0	0	0	1	0	1	1	0	0	2	1	0	2	0	0	0	1	0	0	0	0	9
SATURDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Totals	0	0	0	0	0	0	0	3	0	3	4	1	3	5	4	4	4	0	1	1	1	0	0	0	0	34

Vehicle Counts by Type

Unit Type	Total	Unit Type	Total
1-Passenger Car	33	23-Bicyclist	0
2-(Sport) Utility Vehicle	24	24-Witness	6
3-Passenger Van	1	25-Other	0
4-Cargo Van (10K lbs or Less)	0	26-Construction	0
5-Pickup	12	27-Farm Vehicle	0
6-Motor Home	0	28-Horse and Buggy	0
7-School Bus	0	Total	79
8-Transit Bus	0		
9-Motor Coach	0		
10-Other Bus	0		
11-Motorcycle	0		
12-Moped	0		
13-Low Speed Vehicle	0		
14-Autocycle	0		
15-Experimental	0		
16-Other Light Trucks (10,000 lbs or Less)	0		
17-Medium/Heavy Trucks (More than 10,000 lbs)	2		
18-ATV - (4 wheel)	0		
20-ATV - (2 wheel)	0		
21-Snowmobile	0		
22-Pedestrian	1		

Crash Summary II - Characteristics

Crashes by Driver Action at Time of Crash

Driver Action at Time of Crash	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
No Contributing Action	1	32	5	0	0	0	38
Ran Off Roadway	0	0	0	0	0	0	0
Failed to Yield Right-of-Way	9	1	0	0	0	0	10
Ran Red Light	4	0	0	0	0	0	4
Ran Stop Sign	0	0	0	0	0	0	0
Disregarded Other Traffic Sign	0	0	0	0	0	0	0
Disregarded Other Road Markings	0	0	0	0	0	0	0
Exceeded Posted Speed Limit	0	0	0	0	0	0	0
Drove Too Fast For Conditions	3	0	0	0	0	0	3
Improper Turn	1	0	0	0	0	0	1
Improper Backing	0	0	0	0	0	0	0
Improper Passing	0	0	0	0	0	0	0
Wrong Way	0	0	0	0	0	0	0
Followed Too Closely	10	0	0	0	0	0	10
Failed to Keep in Proper Lane	0	0	0	0	0	0	0
Operated Motor Vehicle in Erratic, Reckless, Careless, Negligent or Aggressive Manner	3	0	0	0	0	0	3
Swerved or Avoided Due to Wind, Slippery Surface, Motor Vehicle, Object, Non-Motorist in Roadway	0	0	0	0	0	0	0
Over-Correcting/Over-Steering	0	0	0	0	0	0	0
Other Contributing Action	3	0	0	0	0	0	3
Unknown	0	0	0	0	0	0	0
Total	34	33	5	0	0	0	72

Crashes by Apparent Physical Condition And Driver

Apparent Physical Condition	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
Apparently Normal	33	33	5	0	0	0	71
Physically Impaired	0	0	0	0	0	0	0
Emotional(Depressed, Angry, Disturbed, etc.)	0	1	0	0	0	0	1
Ill (Sick)	0	0	0	0	0	0	0
Asleep or Fatigued	0	0	0	0	0	0	0
Under the Influence of Medications/Drugs/Alcohol	0	0	0	0	0	0	0
Other	1	0	0	0	0	0	1
Total	34	34	5	0	0	0	73

Driver Age by Unit Type

Age	Driver	Bicycle	SnowMobile	Pedestrian	ATV	Total
09-Under	0	0	0	0	0	0
10-14	0	0	0	0	0	0
15-19	11	0	0	0	0	11
20-24	8	0	0	0	0	8
25-29	2	0	0	0	0	2
30-39	10	0	0	0	0	10
40-49	4	0	0	0	0	4
50-59	12	0	0	0	0	12
60-69	12	0	0	0	0	12
70-79	7	0	0	0	0	7
80-Over	6	0	0	0	0	6
Unknown	0	0	0	1	0	1
Total	72	0	0	1	0	73

Crash Summary II - Characteristics

Most Harmful Event			
Most Harmful Event	Total	Most Harmful Event	Total
1-Overturn / Rollover	0	38-Other Fixed Object (wall, building, tunnel, etc.)	0
2-Fire / Explosion	0	39-Unknown	0
3-Immersion	0	40-Gate or Cable	0
4-Jackknife	0	41-Pressure Ridge	0
5-Cargo / Equipment Loss Or Shift	0	Total	72
6-Fell / Jumped from Motor Vehicle	0		
7-Thrown or Falling Object	0		
8-Other Non-Collision	0		
9-Pedestrian	1		
10-Pedalcycle	0		
11-Railway Vehicle - Train, Engine	0		
12-Animal	0		
13-Motor Vehicle in Transport	68		
14-Parked Motor Vehicle	3		
15-Struck by Falling, Shifting Cargo or Anything Set in Motion by Motor Vehicle	0		
16-Work Zone / Maintenance Equipment	0		
17-Other Non-Fixed Object	0		
18-Impact Attenuator / Crash Cushion	0		
19-Bridge Overhead Structure	0		
20-Bridge Pier or Support	0		
21-Bridge Rail	0		
22-Cable Barrier	0		
23-Culvert	0		
24-Curb	0		
25-Ditch	0		
26-Embankment	0		
27-Guardrail Face	0		
28-Guardrail End	0		
29-Concrete Traffic Barrier	0		
30-Other Traffic Barrier	0		
31-Tree (Standing)	0		
32-Utility Pole / Light Support	0		
33-Traffic Sign Support	0		
34-Traffic Signal Support	0		
35-Fence	0		
36-Mailbox	0		
37-Other Post, Pole, or Support	0		

Traffic Control Devices		
Traffic Control Device	Total	
1-Traffic Signals (Stop & Go)	34	
2-Traffic Signals (Flashing)	0	
3-Advisory/Warning Sign	0	
4-Stop Signs - All Approaches	0	
5-Stop Signs - Other	0	
6-Yield Sign	0	
7-Curve Warning Sign	0	
8-Officer, Flagman, School Patrol	0	
9-School Bus Stop Arm	0	
10-School Zone Sign	0	
11-R.R. Crossing Device	0	
12-No Passing Zone	0	
13-None	0	
14-Other	0	
Total	34	

Injury Data		
Severity Code	Injury Crashes	Number Of Injuries
K	0	0
A	0	0
B	0	0
C	12	16
PD	22	0
Total	34	16

Road Character	
Road Grade	Total
1-Level	33
2-On Grade	1
3-Top of Hill	0
4-Bottom of Hill	0
5-Other	0
Total	34

Light	
Light Condition	Total
1-Daylight	30
2-Dawn	0
3-Dusk	1
4-Dark - Lighted	3
5-Dark - Not Lighted	0
6-Dark - Unknown Lighting	0
7-Unknown	0
Total	34

Crash Summary II - Characteristics**Crashes by Year and Month**

Month	2021	2022	2023	Total
JANUARY	1	3	3	7
FEBRUARY	2	1	0	3
MARCH	2	1	1	4
APRIL	1	0	0	1
MAY	0	1	1	2
JUNE	1	0	2	3
JULY	1	4	0	5
AUGUST	2	1	0	3
SEPTEMBER	1	1	0	2
OCTOBER	0	0	1	1
NOVEMBER	1	1	1	3
DECEMBER	0	0	0	0
Total	12	13	9	34

Report is limited to the last 10 years of data.

Crash Summary II - Characteristics

Crashes by Crash Type and Type of Location

Crash Type	Straight Road	Curved Road	Three Leg Intersection	Four Leg Intersection	Five or More Leg Intersection	Driveways	Bridges	Interchanges	Other	Parking Lot	Private Way	Cross Over	Railroad Crossing	Traffic Circle-Roundabout	Total
Object in Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rear End - Sideswipe	0	0	0	16	0	0	0	0	0	0	0	0	0	0	16
Head-on - Sideswipe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Intersection Movement	0	0	0	17	0	0	0	0	0	0	0	0	0	0	17
Pedestrians	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Train	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Went Off Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All Other Animal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jackknife	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rollover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Submersion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thrown or Falling Object	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Deer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	34	0	0	0	0	0	0	0	0	0	0	34

Crash Summary II - Characteristics**Crashes by Weather, Light Condition and Road Surface**

Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Blowing Sand, Soil, Dirt												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Blowing Snow												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Clear												
Dark - Lighted	3	0	0	0	0	0	0	0	0	0	0	3
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	20	0	0	0	0	0	0	0	0	0	1	21
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Cloudy												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	3	0	0	0	0	0	0	0	0	0	1	4
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics**Crashes by Weather, Light Condition and Road Surface**

Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Fog, Smog, Smoke												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Other												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Rain												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	3	3
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Severe Crosswinds												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics**Crashes by Weather, Light Condition and Road Surface**

Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Sleet, Hail (Freezing Rain or Drizzle)												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Snow												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	2	0	0	0	2
Dusk	0	0	0	0	0	0	0	1	0	0	0	1
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	26	0	0	0	0	0	0	3	0	0	5	34

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☒ Crash Summary I ☐ Section Detail ☒ Crash Summary II ☐ 1320 Public ☐ 1320 Private ☐ 1320 Summary

REPORT DESCRIPTION

Biddeford
Alfred St-Barra Rd area

REPORT PARAMETERS

Year 2021, Start Month 1 through Year 2023 End Month: 12

Route: 3200025	Start Node: 59159 End Node: 59168	Start Offset: 0 End Offset: 0	☒ Exclude First Node ☐ Exclude Last Node
Route: 0111X	Start Node: 57142 End Node: 59234	Start Offset: 0 End Offset: 0	☒ Exclude First Node ☒ Exclude Last Node

Crash Summary I

Nodes															
Node	Route - MP		Node Description	U/R	Total Crashes	K	Injury A	Crashes B	Crashes C	PD	Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
59168	3200025 - 0.32		Non Int BARRA RD	2	1	0	0	0	0	1	0.0	0.338	0.99	0.56	1.76
59159	0111X - 2.06		Int of ALFRED ST BARRA RD W COLE RD	9	34	0	0	0	12	22	35.3	8.017	1.41	1.13	1.25
Study Years: 3.00			NODE TOTALS:		35	0	0	0	12	23	34.3	8.355	1.40	1.09	1.28

Crash Summary I

Sections																	
Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	K	Injury A	Crashes B	Crashes C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
59159	59168	5099102	0 - 0.32	3200025 - 0	0.32	2	3	0	0	0	0	3	0.0	0.00216	462.54	909.47	0.00
Int of ALFRED ST BARRA RD W COLE RD				RD INV 3200025	Statewide Crash Rate: 370.71												
59159	57142	3114974	0 - 0.13	0111X - 1.93	0.13	2	6	0	0	0	1	5	16.7	0.00953	209.84	412.20	0.00
Int of ALFRED ST BARRA RD W COLE RD				ST RTE 111	Statewide Crash Rate: 209.30												
59234	59159	3118497	0.11 - 0.14	0111X - 2.06	0.03	2	2	0	0	0	0	2	0.0	0.00237	281.28	580.94	0.00
Int of ALFRED ST WELLSRING RD				ST RTE 111	Statewide Crash Rate: 209.30												
59234	59159	3118497	0 - 0.11	0111X - 2.06	0.11	2	4	0	0	0	1	3	25.0	0.00869	153.42	420.93	0.00
Int of ALFRED ST WELLSRING RD				ST RTE 111	Statewide Crash Rate: 209.30												
Study Years:		3.00		Section Totals:		0.59	15	0	0	0	2	13	13.3	0.02275	219.74	365.09	0.60
				Grand Totals:		0.59	50	0	0	0	14	36	28.0	0.02275	732.48	504.06	1.45

Crash Summary

Section Details

Start Node	End Node	Element	Offset Begin - End	Route - MP	Total Crashes	K	Injury Crashes				Crash Report	Crash Date	Crash Mile Point	Injury Degree
							A	B	C	PD				
59159	59168	5099102	0 - 0.32	3200025 - 0	3	0	0	0	0	3	2022-14993	05/27/2022	0.05	PD
											2021-9515	04/16/2021	0.06	PD
											2023-3322	01/31/2023	0.23	PD
59159	57142	3114974	0 - 0.13	0111X - 1.93	6	0	0	0	1	5	2021-15006	06/10/2021	1.94	PD
											2022-19047	07/05/2022	1.97	PD
											2022-39406	12/14/2022	1.98	C
											2022-9295	03/18/2022	1.99	PD
											2021-16822	07/02/2021	1.99	PD
											2022-17495	06/20/2022	2.01	PD
59234	59159	3118497	0.11 - 0.14	0111X - 2.06	2	0	0	0	0	2	2022-11788	04/27/2022	2.07	PD
											2022-26689	09/09/2022	2.07	PD
59234	59159	3118497	0 - 0.11	0111X - 2.06	4	0	0	0	1	3	2022-13541	05/10/2022	2.09	PD
											2021-22102	08/19/2021	2.10	C
											2023-24155	08/08/2023	2.10	PD
											2022-23332	08/15/2022	2.11	PD
Totals:					15	0	0	0	2	13				

Crash Summary II - Characteristics

Crashes by Day and Hour

Day Of Week	AM											Hour of Day											PM											Un	Tot
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11											
SUNDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0								
MONDAY	0	0	0	0	0	0	0	0	1	0	2	0	0	1	0	3	1	0	0	0	0	0	0	0	0	0	8								
TUESDAY	0	0	0	0	0	0	0	1	1	0	2	0	1	0	2	1	1	0	1	0	1	0	0	0	0	0	11								
WEDNESDAY	0	0	0	0	0	0	0	1	0	1	0	1	1	3	0	1	1	0	0	0	0	0	0	0	0	0	9								
THURSDAY	0	0	0	0	0	0	0	0	1	1	0	0	2	0	1	0	0	1	0	0	0	0	1	0	0	0	7								
FRIDAY	0	0	0	0	0	0	0	2	1	1	2	0	1	2	1	1	2	0	0	0	1	0	0	0	0	0	14								
SATURDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1								
Totals	0	0	0	0	0	0	0	4	4	3	6	1	5	6	4	6	5	1	1	1	2	0	1	0	0	50									

Vehicle Counts by Type

Unit Type	Total	Unit Type	Total
1-Passenger Car	46	23-Bicyclist	0
2-(Sport) Utility Vehicle	34	24-Witness	8
3-Passenger Van	1	25-Other	0
4-Cargo Van (10K lbs or Less)	0	26-Construction	0
5-Pickup	20	27-Farm Vehicle	0
6-Motor Home	0	28-Horse and Buggy	0
7-School Bus	0		
8-Transit Bus	0	Total	112
9-Motor Coach	0		
10-Other Bus	0		
11-Motorcycle	0		
12-Moped	0		
13-Low Speed Vehicle	0		
14-Autocycle	0		
15-Experimental	0		
16-Other Light Trucks (10,000 lbs or Less)	0		
17-Medium/Heavy Trucks (More than 10,000 lbs)	2		
18-ATV - (4 wheel)	0		
20-ATV - (2 wheel)	0		
21-Snowmobile	0		
22-Pedestrian	1		

Crash Summary II - Characteristics

Crashes by Driver Action at Time of Crash

Driver Action at Time of Crash	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
No Contributing Action	1	46	5	0	0	0	52
Ran Off Roadway	1	0	0	0	0	0	1
Failed to Yield Right-of-Way	17	1	0	0	0	0	18
Ran Red Light	4	0	0	0	0	0	4
Ran Stop Sign	0	0	0	0	0	0	0
Disregarded Other Traffic Sign	0	0	0	0	0	0	0
Disregarded Other Road Markings	0	0	0	0	0	0	0
Exceeded Posted Speed Limit	0	0	0	0	0	0	0
Drove Too Fast For Conditions	3	0	0	0	0	0	3
Improper Turn	3	0	0	0	0	0	3
Improper Backing	0	0	0	0	0	0	0
Improper Passing	0	0	0	0	0	0	0
Wrong Way	0	0	0	0	0	0	0
Followed Too Closely	13	0	0	0	0	0	13
Failed to Keep in Proper Lane	2	1	0	0	0	0	3
Operated Motor Vehicle in Erratic, Reckless, Careless, Negligent or Aggressive Manner	3	0	0	0	0	0	3
Swerved or Avoided Due to Wind, Slippery Surface, Motor Vehicle, Object, Non-Motorist in Roadway	0	0	0	0	0	0	0
Over-Correcting/Over-Steering	0	0	0	0	0	0	0
Other Contributing Action	3	0	0	0	0	0	3
Unknown	0	0	0	0	0	0	0
Total	50	48	5	0	0	0	103

Crashes by Apparent Physical Condition And Driver

Apparent Physical Condition	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
Apparently Normal	47	48	5	0	0	0	100
Physically Impaired	1	0	0	0	0	0	1
Emotional(Depressed, Angry, Disturbed, etc.)	0	1	0	0	0	0	1
Ill (Sick)	1	0	0	0	0	0	1
Asleep or Fatigued	0	0	0	0	0	0	0
Under the Influence of Medications/Drugs/Alcohol	0	0	0	0	0	0	0
Other	1	0	0	0	0	0	1
Total	50	49	5	0	0	0	104

Driver Age by Unit Type

Age	Driver	Bicycle	SnowMobile	Pedestrian	ATV	Total
09-Under	0	0	0	0	0	0
10-14	0	0	0	0	0	0
15-19	13	0	0	0	0	13
20-24	10	0	0	0	0	10
25-29	3	0	0	0	0	3
30-39	19	0	0	0	0	19
40-49	10	0	0	0	0	10
50-59	16	0	0	0	0	16
60-69	16	0	0	0	0	16
70-79	8	0	0	0	0	8
80-Over	8	0	0	0	0	8
Unknown	0	0	0	1	0	1
Total	103	0	0	1	0	104

Crash Summary II - Characteristics

Most Harmful Event			
Most Harmful Event	Total	Most Harmful Event	Total
1-Overturn / Rollover	0	38-Other Fixed Object (wall, building, tunnel, etc.)	0
2-Fire / Explosion	0	39-Unknown	0
3-Immersion	0	40-Gate or Cable	0
4-Jackknife	0	41-Pressure Ridge	0
5-Cargo / Equipment Loss Or Shift	0	Total	103
6-Fell / Jumped from Motor Vehicle	0		
7-Thrown or Falling Object	0		
8-Other Non-Collision	0		
9-Pedestrian	1		
10-Pedalcycle	0		
11-Railway Vehicle - Train, Engine	0		
12-Animal	0		
13-Motor Vehicle in Transport	98		
14-Parked Motor Vehicle	3		
15-Struck by Falling, Shifting Cargo or Anything Set in Motion by Motor Vehicle	0		
16-Work Zone / Maintenance Equipment	0		
17-Other Non-Fixed Object	0		
18-Impact Attenuator / Crash Cushion	0		
19-Bridge Overhead Structure	0		
20-Bridge Pier or Support	0		
21-Bridge Rail	0		
22-Cable Barrier	0		
23-Culvert	0		
24-Curb	0		
25-Ditch	0		
26-Embankment	0		
27-Guardrail Face	0		
28-Guardrail End	0		
29-Concrete Traffic Barrier	0		
30-Other Traffic Barrier	0		
31-Tree (Standing)	1		
32-Utility Pole / Light Support	0		
33-Traffic Sign Support	0		
34-Traffic Signal Support	0		
35-Fence	0		
36-Mailbox	0		
37-Other Post, Pole, or Support	0		

Traffic Control Devices		
Traffic Control Device	Total	
1-Traffic Signals (Stop & Go)	38	
2-Traffic Signals (Flashing)	0	
3-Advisory/Warning Sign	0	
4-Stop Signs - All Approaches	0	
5-Stop Signs - Other	5	
6-Yield Sign	0	
7-Curve Warning Sign	0	
8-Officer, Flagman, School Patrol	0	
9-School Bus Stop Arm	0	
10-School Zone Sign	0	
11-R.R. Crossing Device	0	
12-No Passing Zone	0	
13-None	7	
14-Other	0	
Total	50	

Injury Data		
Severity Code	Injury Crashes	Number Of Injuries
K	0	0
A	0	0
B	0	0
C	14	18
PD	36	0
Total	50	18

Road Character	
Road Grade	Total
1-Level	44
2-On Grade	6
3-Top of Hill	0
4-Bottom of Hill	0
5-Other	0
Total	50

Light	
Light Condition	Total
1-Daylight	44
2-Dawn	0
3-Dusk	2
4-Dark - Lighted	4
5-Dark - Not Lighted	0
6-Dark - Unknown Lighting	0
7-Unknown	0
Total	50

Crash Summary II - Characteristics

Crashes by Year and Month

Month	2021	2022	2023	Total
JANUARY	1	3	4	8
FEBRUARY	2	1	0	3
MARCH	2	2	1	5
APRIL	2	1	0	3
MAY	0	3	1	4
JUNE	2	1	2	5
JULY	2	5	0	7
AUGUST	3	3	1	7
SEPTEMBER	1	2	0	3
OCTOBER	0	0	1	1
NOVEMBER	1	1	1	3
DECEMBER	0	1	0	1
Total	16	23	11	50

Report is limited to the last 10 years of data.

Crash Summary II - Characteristics

Crashes by Crash Type and Type of Location

Crash Type	Straight Road	Curved Road	Three Leg Intersection	Four Leg Intersection	Five or More Leg Intersection	Driveways	Bridges	Interchanges	Other	Parking Lot	Private Way	Cross Over	Railroad Crossing	Traffic Circle-Roundabout	Total
Object in Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rear End - Sideswipe	5	0	0	16	0	2	0	0	0	0	0	0	0	0	23
Head-on - Sideswipe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Intersection Movement	0	0	0	17	0	8	0	0	0	0	0	0	0	0	25
Pedestrians	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Train	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Went Off Road	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
All Other Animal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jackknife	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rollover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Submersion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thrown or Falling Object	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Deer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5	1	0	34	0	10	0	0	0	0	0	0	0	0	50

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Blowing Sand, Soil, Dirt												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Blowing Snow												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Clear												
Dark - Lighted	4	0	0	0	0	0	0	0	0	0	0	4
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	26	0	0	0	0	0	0	0	0	0	1	27
Dusk	1	0	0	0	0	0	0	0	0	0	0	1
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Cloudy												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	5	0	0	0	0	0	0	0	0	0	3	8
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Fog, Smog, Smoke												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Other												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Rain												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	7	7
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Severe Crosswinds												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0

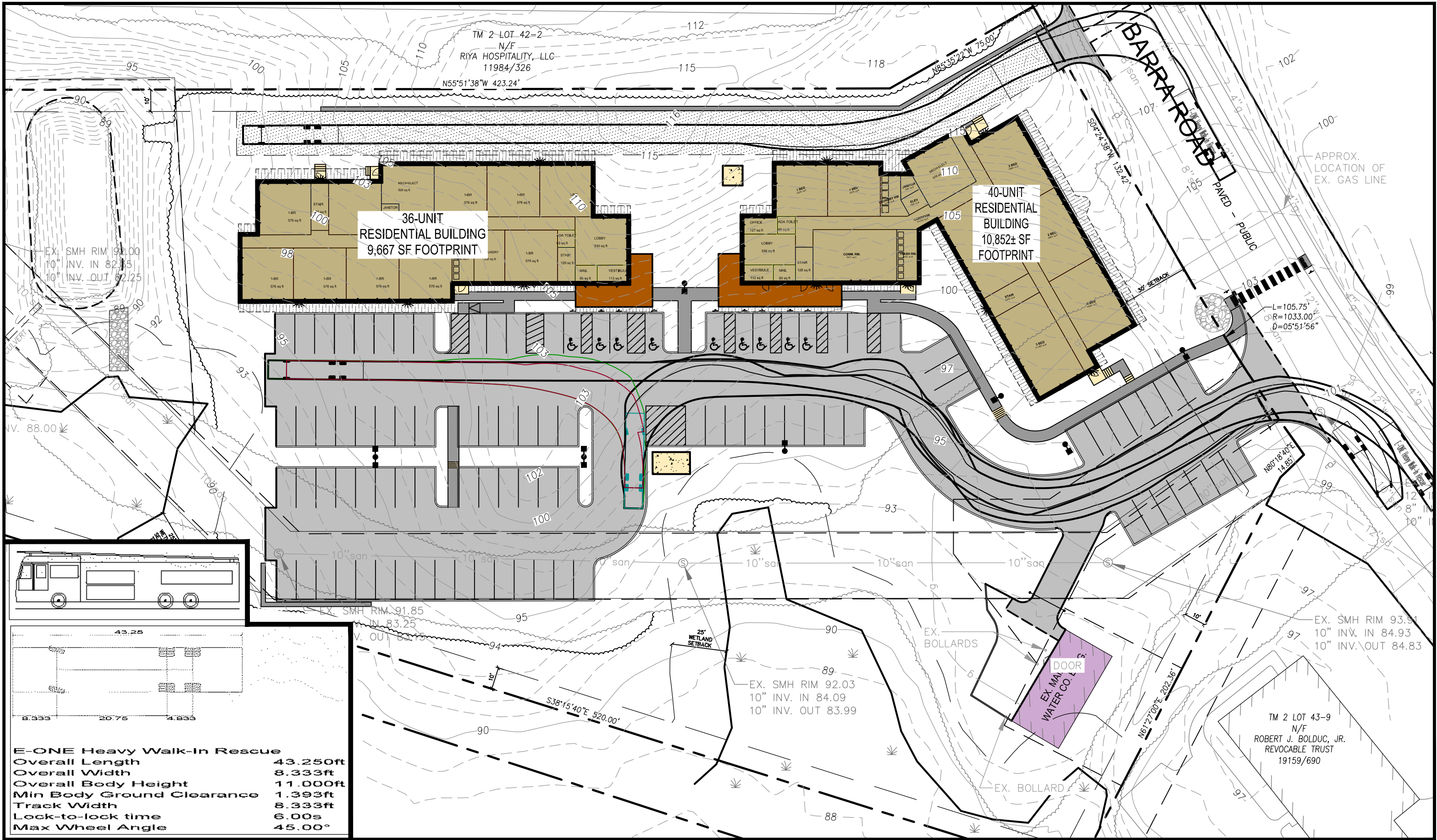
Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Sleet, Hail (Freezing Rain or Drizzle)												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Snow												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	2	0	0	0	2
Dusk	0	0	0	0	0	0	0	1	0	0	0	1
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	36	0	0	0	0	0	0	3	0	0	11	50

ATTACHMENT I

U:\4303_WHA Barra Road Development_Biddeford,ME\Z - CAD\DWG\4303-PBASE.dwg jacob.curtis 7/17/2024 9:58 AM



Gorrill Palmer, an LJB Engineering Company
GorrillPalmer.com
(207) 772-2515
300 Southborough Drive - Suite 200
South Portland, ME 04106

Client/Project
PROPOSED RESIDENTIAL DEVELOPMENT
37 BARRA ROAD, BIDDEFORD, MAINE

File Name: 4303-PBASE

DWN.	CHKD.	DSGN.	24.07.17
			DATE

Title
FIRE TRUCK TURNING MOVEMENTS

Figure No.
1

ATTACHMENT J

VIPER Area/Site

VIPER LUMINAIRE

FEATURES

- Low profile LED area/site luminaire with a variety of IES distributions for lighting applications such as auto dealership, retail, commercial, and campus parking lots
- Featuring two different optical technologies, Strike and Micro Strike Optics, which provide the best distribution patterns for retrofit or new construction
- Rated for high vibration applications including bridges and overpasses. All sizes are rated for 1.5G
- Control options including photo control, occupancy sensing, NX Lighting Controls™, LightGRID+ and 7-Pin with networked controls
- New customizable lumen output feature allows for the wattage and lumen output to be customized in the factory to meet whatever specification requirements may entail
- Field interchangeable mounting provides additional flexibility after the fixture has shipped



CONTROL TECHNOLOGY



SERVICE PROGRAMS



SPECIFICATIONS

CONSTRUCTION

- Die-cast housing with hidden vertical heat fins are optimal for heat dissipation while keeping a clean smooth outer surface
- Corrosion resistant, die-cast aluminum housing with 1000 hour powder coat paint finish
- External hardware is corrosion resistant

OPTICS

- Micro Strike Optics (160, 320, 480, or 720 LED counts) maximize uniformity in applications and come standard with mid-power LEDs which evenly illuminate the entire luminous surface area to provide a low glare appearance. Catalog logic found on page 2
- Strike Optics (36, 72, 108, or 162 LED counts) provide best in class distributions and maximum pole spacing in new applications with high powered LEDs. Strike optics are held in place with a polycarbonate bezel to mimic the appearance of the Micro Strike Optics so both solutions can be combined on the same application. Catalog logic found on page 3
- Both optics maximize target zone illumination with minimal losses at the house-side, reducing light trespass issues. Additional backlight control shields and house side shields can be added for further reduction of illumination behind the pole
- One-piece silicone gasket ensures a weatherproof seal
- Zero up-light at 0 degrees of tilt
- Field rotatable optics

INSTALLATION

- Mounting patterns for each arm can be found on page 11
- Optional universal mounting block for ease of installation during retrofit applications. Available as an option (ASQU) or accessory for square and round poles
- All mounting hardware included
- Knuckle arm fitter option available for 2-3/8" OD tenon
- For products with EPA less than 1 mounted to a pole greater than 20ft, a vibration damper is recommended

ELECTRICAL

- Universal 120-277 VAC or 347-480 VAC input voltage, 50/60 Hz
- Ambient operating temperature -40°C to 40°C
- Drivers have greater than 90% power factor and less than 20% THD
- LED drivers have output power over-voltage, over-current protection and short circuit protection with auto recovery
- Field replaceable surge protection device provides 20kA protection meeting ANSI/ IEEE C62.41.2 Category C High and Surge Location Category C3; Automatically takes fixture off-line for protection when device is compromised
- Dual Driver option provides 2 drivers within luminaire but only one set of leads exiting the luminaire, where Dual Power Feed provides two drivers which can be wired independently as two sets of leads are extended from the luminaire. Both options cannot be combined

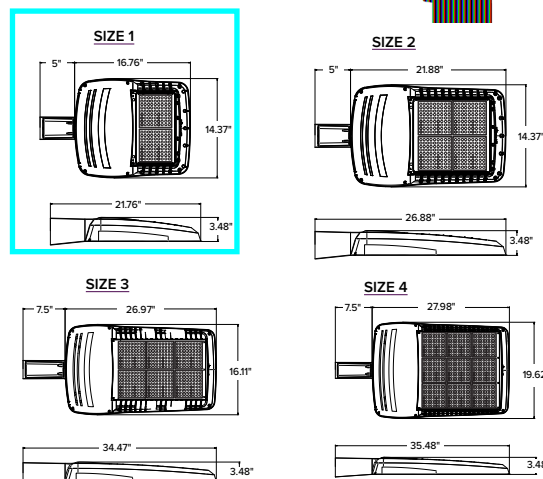
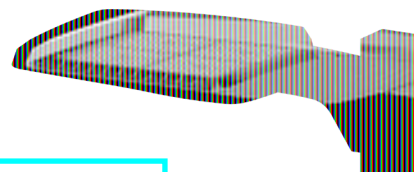
CONTROLS

- Photo control, occupancy sensor programmable controls, and Zigbee wireless controls available for complete on/off and dimming control
- Please consult brand or sales representative when combining control and electrical options as some combinations may not operate as anticipated depending on your application
- 7-pin ANSI C136.41-2013 photocontrol receptacle option available for twist lock photocontrols or wireless control modules (control accessories sold separately)

CONTROLS (CONTINUED)

- 0-10V Dimming Drivers are standard and dimming leads are extended out of the luminaire unless control options require connection to the dimming leads. Must specify if wiring leads are to be greater than the 6" standard
- NX Lighting Controls™ available with in fixture wireless control module, features dimming and occupancy sensor
- LightGRID+ available with in fixture wireless control module, features dimming and occupancy sensor. Also available in 7-pin configuration

MICROSTRIKE | STRIKE OPTICS



	EPA				Config
	VP1 (Size 1)	VP2 (Size 2)	VP3 (Size 3)	VP4 (Size 4)	
Single Fixture	0.454	0.555	0.655	0.698	
Two at 180	0.908	1.110	1.310	1.396	
Two at 90	0.583	0.711	0.857	0.948	
Three at 90	1.037	1.266	1.512	1.646	
Three at 120	0.943	1.155	1.392	1.680	
Four at 90	1.166	1.422	1.714	1.896	

CERTIFICATIONS

- DLC® (DesignLights Consortium Qualified), with some Premium Qualified configurations. Not all product variations listed in this document are DLC® qualified. Refer to <http://www.designlights.org> for the most up-to-date list.
- Listed to UL1598 and CSA C22.2#250.0-24 for wet locations and 40°C ambient temperatures
- 1.5 G rated for ANSI C136.31 high vibration applications
- Fixture is IP65 rated
- Meets IDA recommendations using 3K CCT configuration at 0 degrees of tilt
- This product meets federal procurement law requirements under the Buy American Act (FAR 52.225-9) and Trade Agreements Act (FAR 52.225-11). See Buy America(n) Solutions (link to <https://www.currentlighting.com/resources/america-solutions>).

WARRANTY

- 5 year warranty

VIPER Area/Site

VIPER LUMINAIRE

DATE:	LOCATION:
TYPE:	PROJECT:
CATALOG #:	

STRIKE OPTIC – ORDERING GUIDE

Example: VP-ST-1-36L-39-3K7-2-UNV-A-BLT

CATALOG #							
VP							
Series	Optic Platform	Size	Light Engine	CCT/CRI	Distribution	Optic Rotation	Voltage
VP Viper	ST Strike	1 Size 1	36L-39 ⁸ 5500 lumens 36L-55 ⁸ 7500 lumens 36L-85 10000 lumens 36L-105 12500 lumens 36L-120 14000 lumens 72L-115 15000 lumens 72L-145 18000 lumens 72L-180 21000 lumens 72L-210 24000 lumens 72L-240 27000 lumens 108L-215 ⁸ 27000 lumens 108L-250 30000 lumens 108L-280 33000 lumens 108L-325 36000 lumens 108L-365 40000 lumens 162L-320 40000 lumens 162L-365 ¹⁰ 44000 lumens 162L-405 47000 lumens 162L-445 52000 lumens 162L-485 55000 lumens 162L-545 ⁸ 60000 lumens CLO Custom Luminaire Output ¹	AM monochromatic amber, 595nm 27K8 2700K, 80 CRI 3K7 3000K, 70 CRI 3K8 3000K, 80 CRI 3K9 3000K, 90 CRI 35K8 3500K, 80 CRI 4K7 4000K, 70 CRI 4K8 4000K, 80 CRI 4K9 4000K, 90 CRI 5K7 5000K, 70 CRI 5K8 5000K, 80 CRI	FR Auto Front Row 2 Type 2 3 Type 3 4F Type 4 Forward 4W Type 4 Wide 5QN Type 5 Square Narrow 5QW Type 5 Square Wide 5QM Type 5 Square Medium 5W Type 5 Wide (Round) 5RW Type 5 Rectangular C Corner Optic TC Tennis Court Optic	BLANK No Rotation L Optic rotation left R Optic rotation right	UNV 120-277V 120 120V 208 208V 240 240V 277 277V 347 347V 480 480V
		2 Size 2					
		3 Size 3					
		4 Size 4					

Mounting	Color	Options	Network Control Options
A Arm mount for square pole/flat surface A_ Arm mount for round pole ³ ASQU Universal arm mount for square pole A_U Universal arm mount for round pole ³ AAU Adjustable arm for pole mounting (universal drill pattern) AA_U Adjustable arm mount for round pole ³ ADU Decorative upswept Arm (universal drill pattern) AD_U Decorative upswept arm mount for round pole ³ MAF Mast arm fitter for 2-3/8" OD horizontal arm K Knuckle T Trunnion WB Wall Bracket, horizontal tenon with MAF WM Wall mount bracket with decorative upswept arm WA Wall mount bracket with adjustable arm	BLT Black Matte Textured BLS Black Gloss Smooth DBT Dark Bronze Matte Textured DBS Dark Bronze Gloss Smooth GTT Graphite Matte Textured LGS Light Grey Gloss Smooth LGT Light Grey Gloss Textured PSS Platinum Silver Smooth WHT White Matte Textured WHS White Gloss Smooth VGT Verde Green Textured Color Option CC Custom Color	F Fusing E Battery Backup ^{1,2,7,8,9} 2PF Dual Power Feed 2DR Dual Driver TE Tooless Entry BC Backlight Control TB Terminal Block	NXWS16F NX Networked Wireless Enabled Integral NXSMP2-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming ^{1,4,5} NXWS40F NX Networked Wireless Enabled Integral NXSMP2-HMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming ^{1,4,5} NXW NX Networked Wireless Radio Module NXRM2 and Bluetooth Programming, without Sensor ^{4,5} WIR LightGRID+ In-Fixture Module ^{4,5} WIRSC LightGRID+ Module and Occupancy Sensor ^{4,5} Stand Alone Sensors BTS-14F Bluetooth® Programmable, BTSMP-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens BTS-40F Bluetooth® Programmable, BTSMP-HMO PIR Occupancy Sensor with Automatic Dimming® Photocell and 360° Lens BTSO-12F Bluetooth® Programmable, BTSMP-OMNI-O PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens 7PR 7-Pin Receptacle ⁴ 7PR-SC 7-Pin Receptacle with shorting cap ⁴ 3PR 3-Pin twist lock ⁴ 3PR-SC 3-Pin receptacle with shorting cap ⁴ 3PR-TL 3-Pin PCR with photocontrol ⁴ Programmed Controls SCP_F Sensor Control Programmable, 8F or 40F ¹¹ ADD AutoDim Timer Based Dimming ⁴ ADT AutoDim Time of Day Dimming ⁴ Photocontrols PC Button Photocontrol ^{4,7}

1 – Items with a grey background can be done as a custom order. Contact brand representative for more information

2 – Battery temperature rating -20C to 55C

3 – Replace “_” with “3” for 3.5”-4.13” OD pole, “4” for 4.18”-5.25” OD pole, “5” for 5.5”-6.5” OD pole

4 – Networked Controls cannot be combined with other control options

5 – Not available with 2PF option

6 – Not available with 480V

7 – Not available with 347 or 480V

8 – Not available with Dual Driver option

9 – Only available in Size 1 housing, up to 105 Watts

10 – Some voltage restrictions may apply when combined with controls

11 – At least one SCPREMOTE required to program SCP motion sensor. Must select 8ft or 40ft.

VIPER Area/Site

VIPER LUMINAIRE

DATE:	LOCATION:
TYPE:	PROJECT:
CATALOG #:	

ORDERING GUIDE (CONT'D)

CATALOG #

Accessory Type		Size	Option		Color		
SHD	Shield	1	Size 1	HSS-90-B	House Side Shield 90° Back	BLS	Black Gloss Smooth
		2	Size 2	HSS-90-F	House Side Shield 90° Front	BLT	Black Matte Textured
		3	Size 3	HSS-90-S	House Side Shield 90° Side	DBS	Dark Bronze Gloss Smooth
		4	Size 4	HSS-270-BSS	House Side Shield 270° Back/Side/Side	DBT	Dark Bronze Matte Textured
				HSS-270-FSS	House Side Shield 270° Front/Side/Side	GTT	Graphite Matte Textured
				HSS-270-FSB	House Side Shield 270° Front/Side/Back	LGS	Light Gray Gloss Smooth
				HSS-360	House Side Shield 360°	PSS	Platinum Silver Smooth
				BC	Back Light Control	WHS	White Gloss Smooth
				A	Arm Mount for square pole/flat surface	WHT	White Matte Textured
				ASQU	Universal Arm Mount for square pole	VGT	Green Landscape Decorative
MTG	Mounting			AAU	Adjustable Arm for pole mounting	LEG	Legacy Colors
				ADU	Decorative upswept Arm	Color Option	
				RPA	Round Pole Adapter	CC	Custom Color
				MAF	Mast Arm Fitter for 2-3/8" OD horizontal arm		
				K	Knuckle		
				T	Trunnion		
				WB	Wall Bracket (compatible with universal arm mounts)		
Accessory Type			Option				
MSC	Miscellaneous			BIRD SPK	Bird Spike		

Current Control Solutions — Accessories (Sold Separately)		
NX Lighting Controls		
☐	NXOFM-1R1D-UNV	On-fixture Module (7-pin), On / Off / Dim, Daylight Sensor with NX Radio and Bluetooth® Radio, 120–480VAC
LightGRID+ Lighting Control		
☐	WIR-RME-L	On-fixture Module (7-pin or 5-pin), On / Off / Dim, Daylight Sensor with LightGRID+ Radio, 110–480VAC
☐	SCP-REMOTE	Remote Control for SCP/_F option. Order at least one per project to program and control the occupancy sensor
For additional information related to these accessories please visit currentlighting.com/beacon . Options provided for use with integrated sensor, please view specification sheet ordering information table for details.		

OUTDOOR LIGHTING CONTROLS OPTIONS CONTROLS FUNCTIONALITY LIGHTGRID+

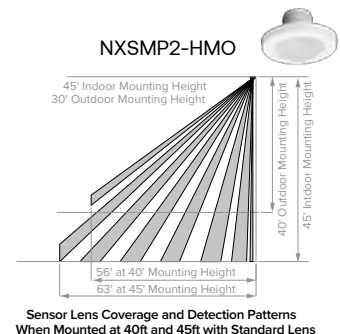
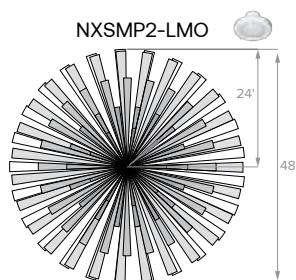
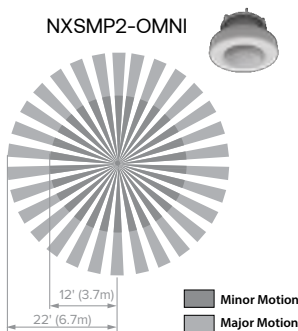
Control Option Ordering Logic & Description		Control Option Functionality									Control Option Components	
		Networkable	Grouping	Scheduling	Occupancy/Motion	Daylight Harvesting	0-10V Dimming	On/Off Control	Bluetooth App Programming	Sensor Height		
NX Wireless	NXOFMIRID-UNV	✓	✓	✓	Paired with external control	✓	✓	✓	✓	-		NXOFM-1R1D-UV
	NXW	✓	✓	✓	-	-	✓	✓	✓	-		NXRM2-H
	NXWS12F	✓	✓	✓	✓	✓	✓	✓	✓	12ft		NXSMP2-OMNI-O
	NXWS16F	✓	✓	✓	✓	✓	✓	✓	✓	16ft		NXSMP2-LMO
	NXWS40F	✓	✓	✓	✓	✓	✓	✓	✓	40ft		NXSMP2-HMO
LightGRID+	WIR	✓	-	✓	-	-	✓	✓	Gateway	-		WIR
	WIR-RME-L	✓	-	✓	-	-	✓	✓	Gateway	-		WIR-RME-L
	WIRSC	✓	✓	✓	✓	✓	✓	✓	Gateway	14ft - 40ft		BTMSP
Independent	BTSO-12F	-	-	-	✓	✓	✓	✓	✓	12ft		BTSMO-OMNI-O
	BTS-14F	-	-	-	✓	✓	✓	✓	✓	14ft		BTSMO-LMO
	BTS-40F	-	-	-	✓	✓	✓	✓	✓	40ft		BTSMO-HMO

DEFAULT SETTINGS

NX Wireless	Occupancy Sensor	Enabled
	Occupancy Sensor Sensitivity	7
	Occupancy Sensor Timeout	15 Minutes
	Occupied Dim Level	100%
	Unoccupied Dim Level	0%
	Daylight Sensor	Disabled
	Bluetooth	Enabled
	2.4GHz Wireless Mesh	On
	Passcode Factory Passcode: HubbN3T!	Enabled

Stand Alone	Occupancy Sensor	Enabled
	Occupancy Sensor Sensitivity	7
	Occupancy Sensor Timeout	8 Minutes
	Occupied Dim Level	100%
	Unoccupied Dim Level	50%
	Daylight Sensor	Disabled

NX WIRELESS COVERAGE PATTERNS



VIPER Area/Site

VIPER LUMINAIRE

DATE:	LOCATION:
TYPE:	PROJECT:
CATALOG #:	

NX LIGHTING CONTROLS FREE APP

CONTROLS TECH SUPPORT 800-888-8006 (7:00 AM - 7:00 PM)



The NX Lighting Controls App is free to use mobile application for programming both NX Lighting Controls System or Standalone Bluetooth Sensors. The mobile app allows you to configure devices, discover and setup wireless enable luminaires and program NX system settings.

Apple App: <https://apps.apple.com/us/app/nx-lighting-controls/id962112904>

Google Play: https://play.google.com/store/apps/details?id=io.cordova.NXBTR&hl=en_US&q=US



Apple App



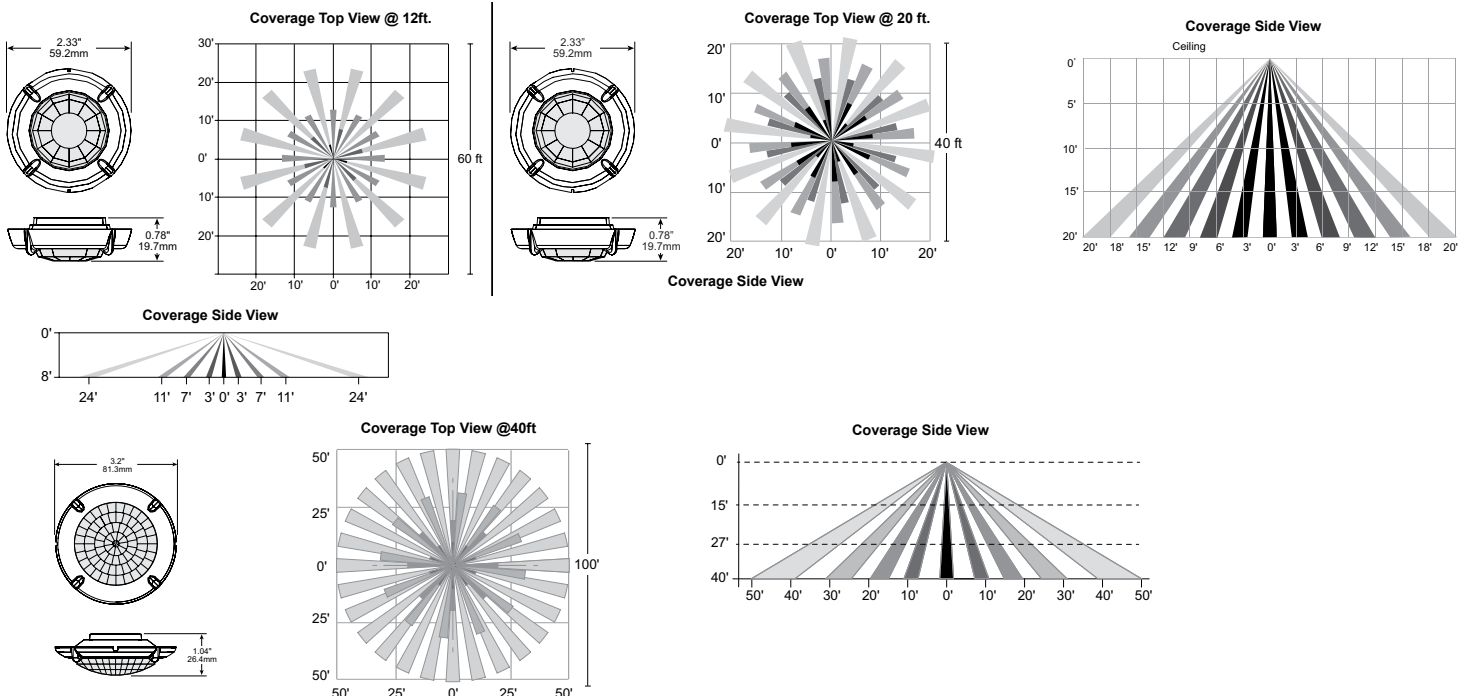
Google Play

OUTDOOR LIGHTING CONTROLS OPTIONS

CONTROLS FUNCTIONALITY

Control Option Ordering Logic & Description		Control Option Functionality									Control Option Components	
		Networkable	Grouping	Scheduling	Occupancy/ Motion	Daylight Harvesting	0-10V Dimming	On/Off Control	Bluetooth App Programming	Sensor Height		
Independent	SCP_F	Sensor Control Programmable, 8F or 40F	-	-	-	✓	✓	✓	✓	-	8ft or 40ft	SCP_F
	ADD	AutoDIM Timer Based Dimming	-	-	✓	-	-	-	✓	-	-	ADD
	ADT	AutoDIM Time of Day Dimming	-	-	✓	-	-	-	✓	-	-	ADT
	7PR	7-Pin Receptacle	-	-	Paired with external control	-	Paired with external control	-	Paired with external control	-	-	7PR
	7PR-SC	7-Pin Receptacle with shorting cap	-	-	-	-	-	-	-	-		7PR-SC
	3PR	3-Pin twist lock	-	-	-	-	-	-	Paired with external control	-	-	3PR
	3PR-SC	3-Pin Receptacle with shorting cap	-	-	-	-	-	-	-	-		3PR-SC
	3PR-TL	3-Pin with photocontrol	-	-	-	-	✓	-	✓	-	-	

COVERAGE PATTERNS FOR SCP_F



VIPER Area/Site

VIPER LUMINAIRE

PROGRAMMED CONTROLS

ADD-AutoDim Timer Based Options

- Light delay options from 1-9 hours after the light is turned on to dim the light by 10-100%. To return the luminaire to its original light level there are dim return options from 1-9 hours after the light has been dimmed previously.

EX: ADD-6-5-R6

ADD Control Options	Configurations Choices	Example Choice Picked
Auto-Dim Options	1-9 Hours	6 - Delay 6 hours
Auto-Dim Brightness	10-100% Brightness	5 - Dim to 50% brightness
Auto-Dim Return	Delay 0-9 Hours	R6 - Return to full output after 6 hours

ADT-AutoDim Time of Day Based Option

- Light delay options from 1AM-9PM after the light is turned on to dim the light by 10-100%. To return the luminaire to its original light level there are dim return options from 1AM-9PM after the light has been dimmed previously.

EX: ADT-6-5-R6

ADD Control Options	Configurations Choices	Example Choice Picked
Auto-Dim Options	12-3 AM and 6-11 PM	6 - Dim at 6PM
Auto-Dim Brightness	10-100% Brightness	5 - Dim to 50%
Auto-Dim Return	12-6 AM and 9-11P	R6 - Return to full output at 6AM

DELIVERED LUMENS

For delivered lumens, please see Lumens Data PDF on www.Currentlighting.com

PROJECTED LUMEN MAINTENANCE

Ambient Temp.	0	25,000	*TM-21-11 36,000	50,000	100,000	Calculated L ₇₀ (Hours)
25°C / 77°F	1.00	0.97	0.96	0.95	0.91	408,000
40°C / 104°F	0.99	0.96	0.95	0.94	0.89	356,000

LUMINAIRE AMBIENT TEMPERATURE FACTOR (LATF)

Ambient Temperature		Lumen Multiplier	Micro Strike Lumen Multiplier				Strike Lumen Multiplier			
			CCT	70 CRI	80 CRI	90 CRI	CCT	70 CRI	80 CRI	90 CRI
0°C	32°F	1.03	2700K	—	0.841	—	2700K	0.9	0.81	0.62
10°C	50°F	1.01	3000K	0.977	0.861	0.647	3000K	0.933	0.853	0.659
20°C	68°F	1.00	3500K	—	0.900	—	3500K	0.959	0.894	0.711
25°C	77°F	1.00	4000K	1	0.926	0.699	4000K	1	0.9	0.732
30°C	86°F	0.99	5000K	1	0.937	0.791	5000K	1	0.9	0.732
40°C	104°F	0.98	AP-Amber Phosphor Converted Multiplier				Monochromatic Amber Multiplier			
			Amber	0.710			Amber	See Amber Spec Sheet		

VIPER Area/Site

VIPER LUMINAIRE

DATE:	LOCATION:
TYPE:	PROJECT:
CATALOG #:	

ELECTRICAL DATA: STRIKE

# OF LEDS	36				
NOMINAL WATTAGE	39	55	85	105	120
SYSTEM POWER (W)	39.6	56.8	83.6	108.2	120.9
INPUT VOLTAGE (V)	CURRENT (Amps)				
120	0.33	0.46	0.71	0.88	0.96
208	0.19	0.26	0.41	0.50	0.55
240	0.16	0.23	0.35	0.44	0.48
277	0.14	0.20	0.31	0.38	0.42
347	0.11	0.16	0.24	0.30	0.33
480	0.08	0.11	0.18	0.22	0.24

# OF LEDS	72				
NOMINAL WATTAGE	115	145	180	210	240
SYSTEM POWER (W)	113.7	143.2	179.4	210.2	241.7
INPUT VOLTAGE (V)	CURRENT (Amps)				
120	1.00	1.21	1.50	1.75	1.79
208	0.58	0.70	0.87	1.01	1.03
240	0.50	0.60	0.75	0.88	0.90
277	0.43	0.52	0.65	0.76	0.78
347	0.35	0.42	0.52	0.61	0.62
480	0.25	0.30	0.38	0.44	0.45

# OF LEDS	108				
NOMINAL WATTAGE	215	250	280	325	365
SYSTEM POWER (W)	214.8	250.8	278.3	324.7	362.6
INPUT VOLTAGE (V)	CURRENT (Amps)				
120	2.00	2.08	2.33	3.04	2.67
208	1.15	1.20	1.35	1.75	1.54
240	1.00	1.04	1.17	1.52	1.33
277	0.87	0.90	1.01	1.32	1.16
347	0.69	0.72	0.81	1.05	0.92
480	0.50	0.52	0.58	0.76	0.67

# OF LEDS	162					
NOMINAL WATTAGE	320	365	405	445	485	545
SYSTEM POWER (W)	322.1	362.6	403.6	445.1	487.1	543.9
INPUT VOLTAGE (V)	CURRENT (Amps)					
120	2.71	2.67	3.38	3.71	4.04	4.54
208	1.56	1.54	1.95	2.14	2.33	2.62
240	1.35	1.33	1.69	1.85	2.02	2.27
277	1.17	1.16	1.46	1.61	1.75	1.97
347	0.94	0.92	1.17	1.28	1.40	1.57
480	0.68	0.67	0.84	0.93	1.01	1.14

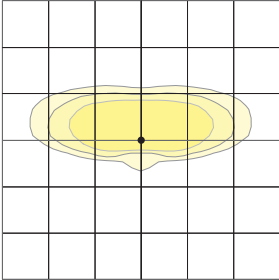
VIPER Area/Site

VIPER LUMINAIRE

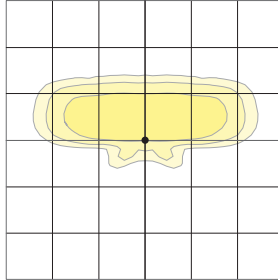
OPTIC STRIKE PHOTOMETRY

The following diagrams represent the general distribution options offered for this product. For detailed information on specific product configurations, see website photometric test reports.

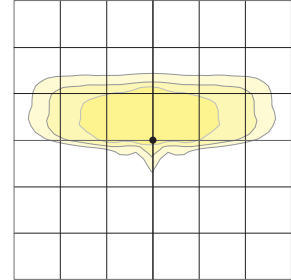
Type FR – Front Row/Auto Optic



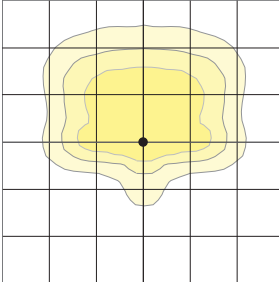
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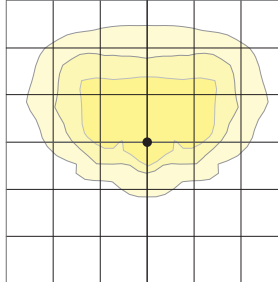
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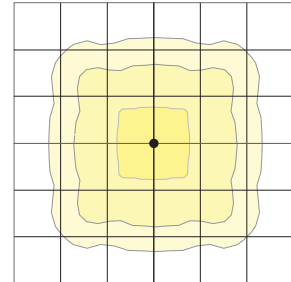
Type 4 Forward



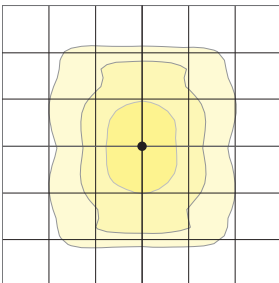
Type 4 Wide



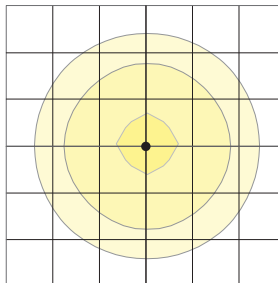
Type 5QM



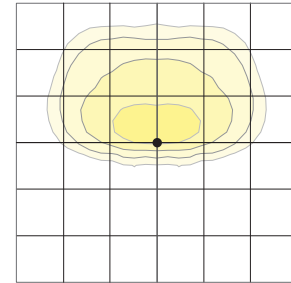
Type 5RW (rectangular)



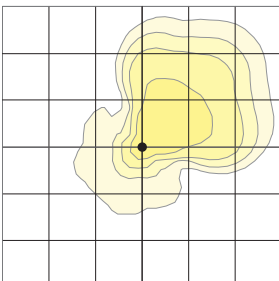
Type 5W (round wide)



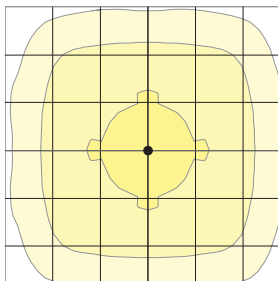
Type TC



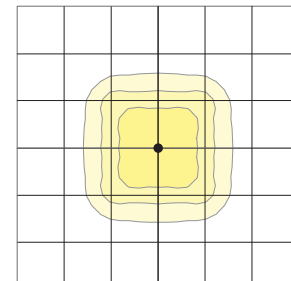
Type Corner



Type 5QW



Type 5QN



VIPER Area/Site

VIPER LUMINAIRE

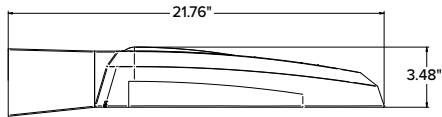
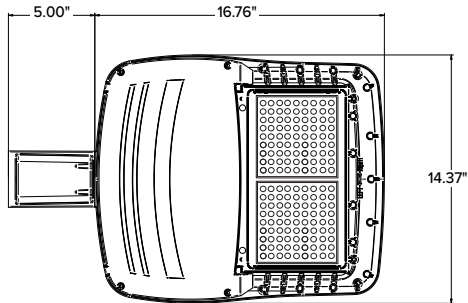
DATE: _____ LOCATION: _____

TYPE: _____ PROJECT: _____

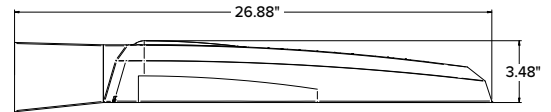
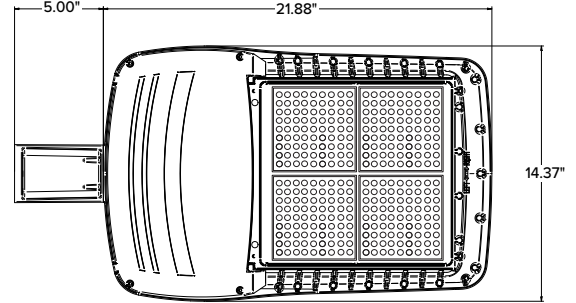
CATALOG #: _____

DIMENSIONS

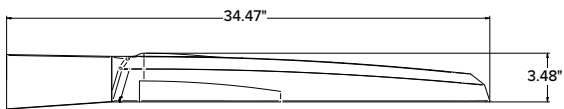
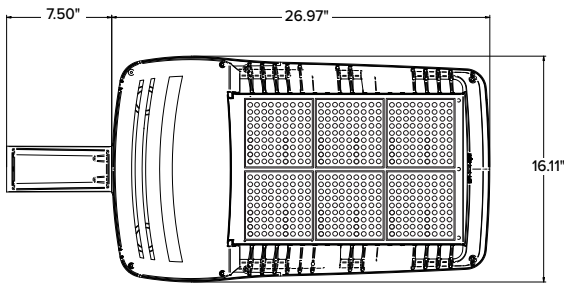
SIZE 1



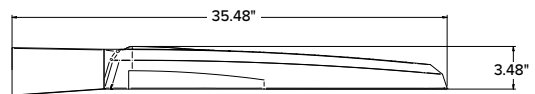
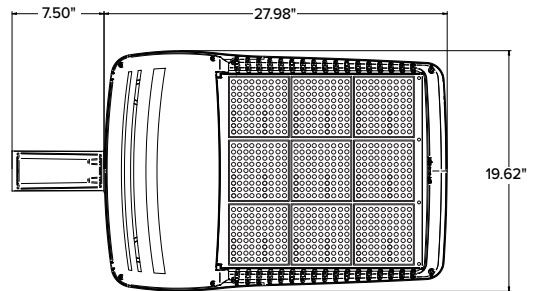
SIZE 2



SIZE 3



SIZE 4



	EPA				Config.
	VP1 (Size 1)	VP2 (Size 2)	VP3 (Size 3)	VP4 (Size 4)	
Single Fixture	0.454	0.555	0.655	0.698	
Two at 180	0.908	1.110	1.310	1.396	
Two at 90	0.583	0.711	0.857	0.948	
Three at 90	1.037	1.266	1.512	1.646	
Three at 120	0.943	1.155	1.392	1.680	
Four at 90	1.166	1.422	1.714	1.896	

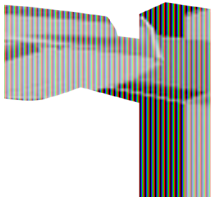
	Weight	
	lbs	kgs
VP1 (Size 1)	13.7	6.2
VP2 (Size 2)	16.0	7.26
VP3 (Size 3)	25.9	11.7
VP4 (Size 4)	30.8	13.9

VIPER Area/Site

VIPER LUMINAIRE

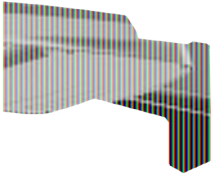
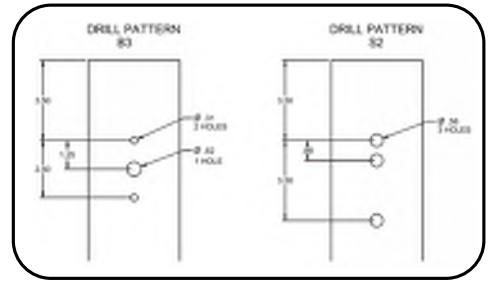
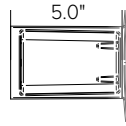
DATE:	LOCATION:
TYPE:	PROJECT:
CATALOG #:	

MOUNTING



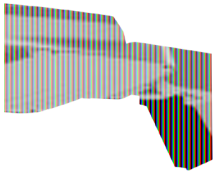
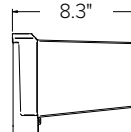
A-STRAIGHT ARM MOUNT

Fixture ships with integral arm for ease of installation. Compatible with Current Outdoor B3 drill pattern for ease of installation on square poles. For round poles add applicable suffix (2/3/4/5)



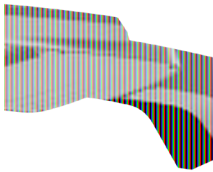
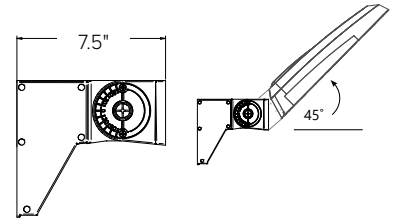
ASQU-UNIVERSAL ARM MOUNT

Universal mounting block for ease of installation. Compatible with drill patterns from 1.5" to 5.25" and Current drill pattern S2. For round poles add applicable suffix (2/3/4/5)



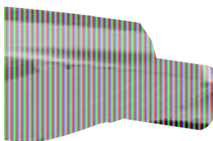
AAU-ADJUSTABLE ARM FOR POLE MOUNTING

Rotatable arm mounts directly to pole. Compatible with drill patterns from 1.5" to 5.25" and Current drill pattern S2 and B3. For round poles add applicable suffix (2/3/4/5). Rotatable in 5° aiming angle increments. Micro Strike configurations have a 45° aiming limitation. Strike configurations have a 30° aiming limitation.



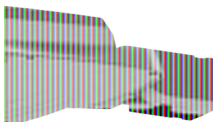
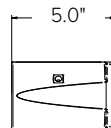
ADU-DECORATIVE UPSWEPT ARM

Upswept Arm compatible with drill patterns from 1.5" to 5.25" and Current drill pattern S2. For round poles add applicable suffix (2/3/4/5).



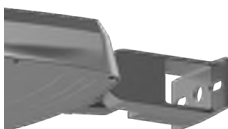
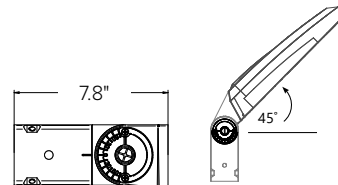
MAF-MAST ARM FITTER

Fits 2-3/8" OD horizontal tenons.



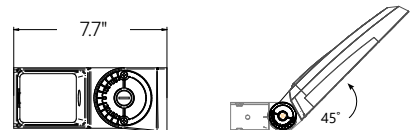
K-KNUCKLE

Rotatable in 5-degree aiming angle increments, fits 2-3/8" tenons or pipes. Micro Strike configurations have a 45° aiming limitation. Strike configurations have a 30° aiming limitation.



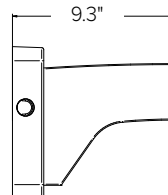
T-TRUNNION

Trunnion for surface and crossarm mounting using (1) 3/4" or (2) 1/2" size through bolts. Micro Strike configurations have a 45° aiming limitation. Strike configurations have a 30° aiming limitation.



WM-WALL MOUNT

Compatible with universal arm mount, adjustable arm mount, and decorative arm mount. The WA option uses the same wall bracket but replaces the decorative arm with an adjustable arm.



VIPER Area/Site

VIPER LUMINAIRE

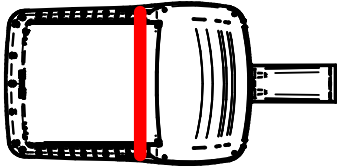
ADDITIONAL INFORMATION (CONTINUED)

HOUSE SIDE SHIELD FIELD INSTALL ACCESSORIES

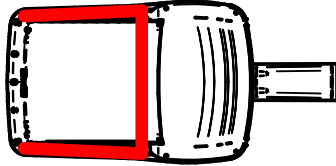
HSS has a depth of 5" for all Viper sizes

Not to be used with Occupancy Sensors as the shield may block the light to the sensor.

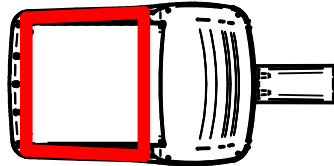
VPR2x HSS-90-B-xx



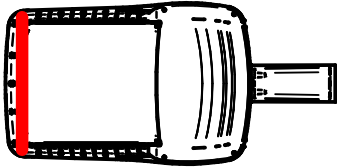
VPR2x HSS-270-BSS-xx



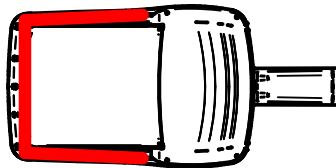
VPR2x HSS-360-xx



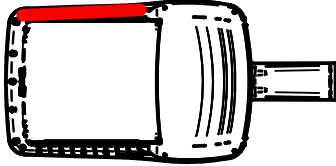
VPR2x HSS-90-F-xx



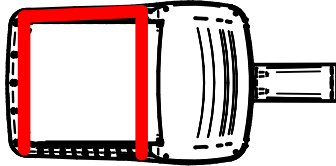
VPR2x HSS-270-FSS-xx



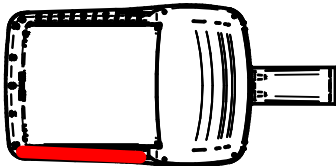
VPR2x HSS-90-S-xx



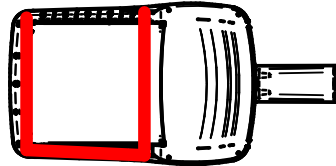
VPR2x HSS-270-FSB-xx



VPR2x HSS-90-S-xx



VPR2x HSS-270-FSB-xx



GEOPAK SERIES 1

SIZE 1 - TRP1/QSP1/RD11

DATE:	LOCATION:
TYPE:	PROJECT:
CATALOG #:	

FEATURES

- GeoPak Series consists of three compact Geometric wall-pack shapes in four popular finishes
- 24 mid-power LEDs create 3115 lumens in AC and 1628 lumens in emergency mode
- Environmentally friendly, long-life Lithium Iron Phosphate battery
- Standard Battery Temperature Range: 0°C to 40°C, Optional Heater: -30°C to 40°C
- Zero uplight distributions



SPECIFICATIONS

CONSTRUCTION

- Housing is made from die-cast aluminum with a hinged back-plate for ease of installation and maintenance
- Powder paint finish provides durability in outdoor environments. Tested to meet 1000 hour salt spray rating.
- Wet Location Listed to UL924 and UL1598 Standard

OPTICS

- 24 mid power LEDs delivering up to 3,000 lumens
- Up to 118 lumens per watt
- Type III and IV distributions for a wide variety of applications
- Zero uplight (UO), dark sky, neighbor friendly

INSTALLATION

- Universal plate for mounting to standard 3 1/2" and 4" square electrical boxes. All connections are made from connections at the rear of the unit
- Optional back-box accessory available for surface conduit application.

ELECTRICAL

- 120-277 and 347-480V operation, 50/60Hz
- 0-10V dimming driver standard. Dimming leads are extended from the product.
- 10kA surge protector
- Photocell and occupancy sensor options available for complete on/off and dimming control
- Integral Battery Backup provides emergency lighting for the required 90 minute path of egress
- Includes a long-life Lithium Iron Phosphate battery with optional battery heater for cold temperature application
- Ambient operating temperature -40°C to 40°C
- Button photocontrol is suitable for 120-277V operation
- Please consult brand or sales representative when combining control and electrical options as some combinations may not operate as anticipated depending on your application.

CERTIFICATIONS

- Drivers IP66 and RoHS compliant
- Listed to UL1598 and CSAC22.2#250.0-24 for wet location

WARRANTY

- 5 year warranty

KEY DATA	
Lumen Range	1720-2896
Wattage Range	15-25
Efficacy Range (LPW)	107-131
Weights lbs. (kg)	10.5–11.5 (4.8–5.2)

GEOPAK SERIES 1

SIZE 1 - TRP1/QSP1/RD11

ORDERING GUIDE

Example: TRP1-24L-25-4K7-3-UNV-DBT

CATALOG #

ORDERING INFORMATION

Series	# LEDs	Wattage	CCT/CRI	Distribution	Voltage
TRP1 Trapezoid	24L 24 LEDs	15 15 watts	3K7 3000K, 70 CRI	3 TYPE III	UNV 120-277V
RD11 Radius		20 20 watts	4K7 4000K, 70 CRI	4W TYPE IV	120 120V
QSP1 Qtr-sphere		25 25 watts	5K7 5000K, 70 CRI		208 208V
			3K8 3000K, 80 CRI		240 240V
			4K8 4000K, 80 CRI		277 277V
			5K8 5000K, 80 CRI		347 347V
					480 480V

Color	Control Options Network	Options
BLT Black Matte Textured	PC Button Photocontrol	F ⁴ Fusing (only available with STD fixture configuration, 120-277V only)
BLS Black Gloss Smooth	SCP ^{2,3} Programmable occupancy sensor, factory default is 10% light output	E ^{1,5} Battery pack (0°C)
DBT Dark Bronze Matte Textured	Spec SCP/SCO & SWPM Mount Height	EH ^{1,5} Battery pack (-30°C) with heater
DBS Dark Brone Gloss Smooth	-8F Up to 8ft mount height	
GTT Graphite Matte Textured	-20F Up to 20ft mount height	
LGS Light Grey Gloss Smooth		
PSS Platinum Silver Smooth		
WHT White Matte Textured		
WHS White Gloss Smooth		
VGTT Verde Green Textured		
Color Option		
CC Custom Color		

Notes:

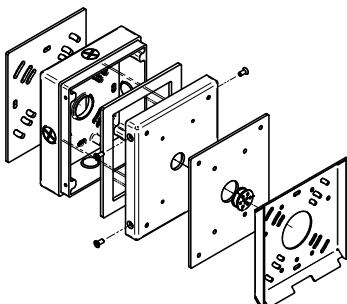
- 1 Voltage specific (120 or 277V only)
- 2 Must order minimum of one remote control to program dimming settings, 0-10V fully adjustable dimming with automatic daylight calibration and different time delay settings, 120-277V only
- 3 PCU option not applicable, included in sensor
- 4 Must specify input voltage (120, 208, 240 or 277)
- 5 PCU and EH cannot be combined in the QSP1 because of space constraints

ACCESSORIES (ORDERED SEPARATELY)

Catalog Number	Description
☐ SCP-REMOTE*	Remote control for SCP option. Order at least one per
☐ WP-BB-XXX	Accessory for conduit entry, replace "xxx" with color option

Notes:

- * Must order minimum of one remote control to program dimming settings, 0-10V fully adjustable dimming with automatic daylight calibration and different time delay settings.
- WB-BB Wallpack Back Box



GEOPAK SERIES 1

SIZE 1 - TRP1/QSP1/RD11

DATE:	LOCATION:
TYPE:	PROJECT:
CATALOG #:	

PERFORMANCE DATA

Description	Drive Current	System Watts	Dist. Type	5K (5000K NOMINAL 70 CRI)					4K (4000K NOMINAL 70 CRI)					3K (3000K NOMINAL 80 CRI)				
				Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G
24L	350 mA	15	3	1888	127	0	0	1	1879	126	0	0	1	1807	121	0	0	1
	350 mA	15	4W	1797	121	0	0	1	1789	120	0	0	1	1720	115	0	0	1
	500 mA	20	3	2607	131	1	0	1	2594	130	1	0	1	2495	125	1	0	1
	500 mA	20	4W	2481	125	1	0	1	2469	124	1	0	1	2374	119	1	0	1
	600 mA	25	3	2896	113	1	0	1	2884	112	1	0	1	2773	110	1	0	1
	600 mA	25	4W	2756	107	1	0	1	2754	107	1	0	1	2640	108	1	0	1

ELECTRICAL DATA

INPUT POWER CONSUMPTION

System Watts	Input Voltage (V)	System Power (W)	Current (Amps)
15W	120	14.9	0.125
	277		0.053
	347		0.043
	480		0.031
20W	120	20.6	0.172
	277		0.074
	347		0.059
	480		0.043
25W	120	25.3	0.216
	277		0.091
	347		0.073
	480		0.053

Battery backup units consume additional power during charging (maximum 32.2 watts for E, 50.7 watts for EH)

INPUT POWER CONSUMPTION

Ambient Temperature	OPERATING HOURS					
	0	25,000	50,000	TM-21-11* L96 60,000	100,000	L70 (Hours)
25C	1	0.97	0.95	0.94	0.91	4,25,000
40C	0.99	0.96	0.94	0.93	0.9	3,70,000

LUMINAIRE AMBIENT TEMPERATURE FACTOR (LATF)

Ambient Temperature		Lumen Multiplier
0C	32F	1.03
10C	50F	1.01
20C	68F	1
25C	77F	1
30C	86F	0.99
40C	104F	0.98

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

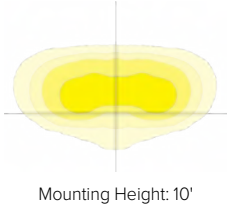
GEOPAK SERIES 1

SIZE 1 - TRP1/QSP1/RD11

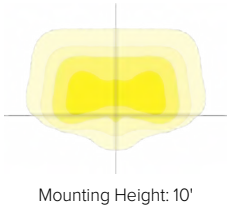
PHOTOMETRY

The following diagrams represent the general distribution options offered for this product.

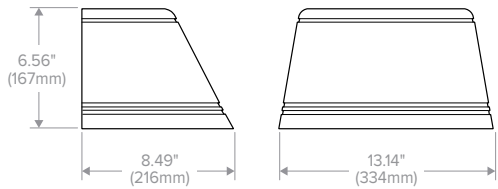
Type III



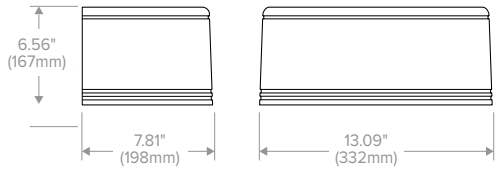
Type IV (Forward throw)



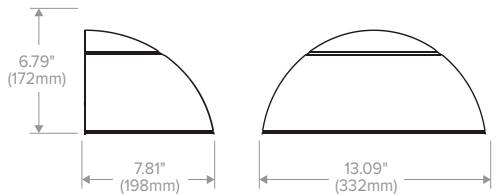
DIMENSIONS



Trapezoid
(TRP1)



Round
(RD11)



Quartersphere
(QSP1)

GEOPAK SERIES 1

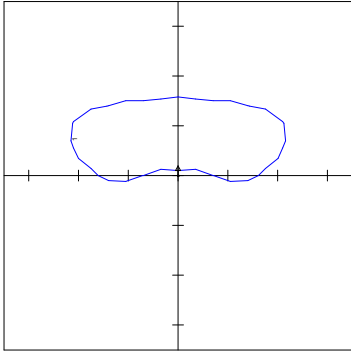
SIZE 1 - TRP1/QSP1/RD11

DATE:	LOCATION:
TYPE:	PROJECT:
CATALOG #:	

ADDITIONAL INFORMATION

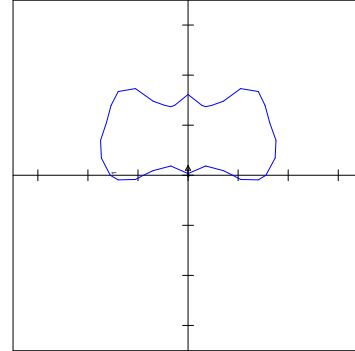
GEOPAK - BATTERY BACK UP

Type 3 Emergency Mode



13W battery when powered covers 20' throw to either side of fixture and 15' throw forward at a 10' mounting height.

Type 4 Emergency Mode



13W battery when powered covers 18' throw to either side of fixture and 15' throw forward at a 10' mounting height.

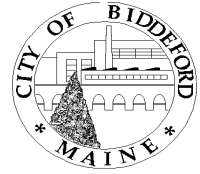
Provides Life Safety Code average illuminance of 1.0 fc. Assumes open space with no obstructions.

Diagrams for illustration purposes only, please consult factory for application layout.

ATTACHMENT K

City of Biddeford, Maine

COST ESTIMATE WORKSHEET



OWNER/APPLICANT:

Westbrook Development Corporation

PROJECT NAME:

37 Barra Road - Residential Development

	ITEM	UNIT	QUANTITY	UNIT COST	TOTAL
1	Clearing and Grubbing	Acre	2	\$12,000.00	\$24,000.00
2	Erosion/Sediment Control	Lump Sum	1	\$15,000.00	\$15,000.00
3	Site Stabilization	Lump Sum	1	\$5,000.00	\$5,000.00
4	Ledge Removal	Cubic Yard	1000	\$150.00	\$150,000.00
5	Sanitary Sewer				
	Manholes	Each	4	\$6,000.00	\$24,000.00
	Main	Linear Foot	200	\$80.00	\$16,000.00
	House Services	Linear Foot			\$0.00
6	Water Main				
	Main	Linear Foot	350	\$100.00	\$35,000.00
	Services	Linear Foot	40	\$90.00	\$3,600.00
	House Services	Linear Foot			\$0.00
	Hydrants	Each	1	\$6,000.00	\$6,000.00
7	Electric				
	Underground Utility Trench	Linear Foot	400	\$50.00	\$20,000.00
	Conduit/Wiring	Linear Foot	450	\$20.00	\$9,000.00
	Transformer Bases	Each	1	\$7,500.00	\$7,500.00
8	Storm Drainage				
	Pipe/Culvert	Linear Foot	1229	\$95.00	\$116,755.00
	Catch Basin	Each	17	\$6,000.00	\$102,000.00
	Other Treatment Devices	Each			\$0.00
9	Stormwater Management				
	Outlet Control Structure	Each			\$0.00
	Stromwater Management Facilities	Each			\$0.00
10	Excavate and Grade Subgrade	Cubic Yard	11875	\$30.00	\$356,250.00
11	Roadways				
	Subbase Gravel	Cubic Yard			\$0.00
	Base/Finish Gravel	Cubic Yard			\$0.00
	Base Paving	Ton			\$0.00
	Finish Paving	Ton			\$0.00
	Geotextile Fabric	Ton			\$0.00
12	Sidewalks				
	Subbase Gravel	Cubic Yard	56	\$35.00	\$1,956.50
	Base/Finish Gravel	Cubic Yard	19	\$40.00	\$748.00
	Base Paving	Ton	12	\$120.00	\$1,476.00
	Finish Paving	Ton	12	\$150.00	\$1,845.00
13	Parking Lots/Other Areas				
	Subbase Gravel	Cubic Yard	1609	\$35.00	\$56,318.50
	Base/Finish Gravel	Cubic Yard	322	\$40.00	\$12,876.00
	Base Paving	Ton	425	\$120.00	\$50,976.00
	Finish Paving	Ton	319	\$150.00	\$47,790.00

City of Biddeford, Maine

COST ESTIMATE WORKSHEET

14	Curbing – Bituminous	Linear Foot			\$0.00
15	Curbing - Concrete	Linear Foot	1710	\$20.00	\$34,200.00
15	Curbing – Granite	Linear Foot			\$0.00
16	Pavement Striping	Linear Foot	2270	\$1.50	\$3,405.00
17	Guardrail	Linear Foot			\$0.00
18	Fencing	Linear Foot			\$0.00
19	Loam and Seed	1,000 Square Feet	30	\$500.00	\$15,000.00
20	Riprap	Cubic Yard	26	\$120.00	\$3,120.00
21	Landscaping	Lump Sum			\$0.00
22	Street Lights	Each			\$0.00
23	Site Lighting	Each	7	\$3,500.00	\$24,500.00
24	Monuments/Iron Pipes	Lump Sum			\$0.00
25	Clean Up	Lump Sum	1	\$5,000.00	\$5,000.00
26	As Builts	Lump Sum	1	\$2,000.00	\$2,000.00
27	Other				\$0.00
28	Other				\$0.00
29	Other				\$0.00
30	Other				\$0.00
31	Other				\$0.00

COST ESTIMATE TOTAL:

\$1,151,316.00

150% of TOTAL:

\$1,726,974.00

FOR OFFICE USE ONLY

EROSION CONTROL/SITE STABILIZATION BOND (IF APPLICABLE):

PERFORMANCE GUARANTEE REQUIRED:

Name:

Signature:

Date:

ATTACHMENT L

NOTE: This drawing is PRELIMINARY ONLY. It is NOT intended for use as a construction document.

AREA IMPACTING 8" CALIPER TREE OR LARGER:
REMOVALS (APPROX.)
(18) WHITE PINE TREES +/-
(1) 12" CHERRY TREE

POTENTIAL AREA IMPACTING 8" CALIPER TREE OR LARGER, TYP.
PREDOMINATELY 2-4" CALIPER POPLAR TREES

TM 2 LOT 42-2
N/F
RIYA HOSPITALITY, LLC
11984/326

BARRA ROAD

APPROX. LOCAT
OF EX. GAS LIN

Prepared for:
Westbrook Development Corporation,
Thatcher Brook Apartments I, LP, &
Thatcher Brook Apartments II, LP
30 Liza Harmon Drive
Westbrook, ME 04092

Prepared By:
dry landscape architecture, LLC
31 miller ave.
Biddeford, ME 04005

Date:
JULY 17, 2024

Issued For:
PLANNING BOARD REVIEW

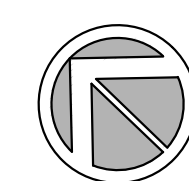
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Architecture, LLC is prohibited. © 2024

Title:
VEGETATION MANAGEMENT
EXHIBIT A

PROPOSED
RESIDENTIAL
REDEVELOPMENT
37 BARRA RD,
BIDDEFORD, ME

Revisions:

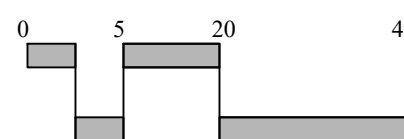
North:



Sheet No.:

EX-A

Scale: 1" = 20'-0"



POTENTIAL AREA IMPACTING 8" CALIPER TREE OR LARGER, TYP.

TM 2 LOT 43-10
N/F
MIKE EON ASSOCIATES, LTD.
7955/278

TM 2 LOT 43-9
N/F
ROBERT J. BOLDOC, JR
REVOCABLE TRUST
19159/690

CITY OF BIDDEFORD - SITE PLAN APPLICATION DRAWING CHECKLIST

LAST REVISED: 05/17/23

CHECKLIST DIRECTIONS:

- The following checklist must be completely filled out by the applicant for any Site Plan submittal to the Planning Department.
- Applicant to confirm all of the items listed are included within the submittal. Any missing items must have adequate reasoning to justify their absence.
- City to review applicant's submittal and checklist responses. Projects missing submittal information with non-acceptable reasoning will be rejected.
- Items in **BLACK** are required for 'Preliminary Site Plan' approval & 'Final Site Plan' approval.
- Items in **BLUE** are only required for 'Final Site Plan' approval.

SUBMITTAL INFORMATION - TO BE FILLED OUT BY APPLICANT	
Project Name:	37 Barra Road - Residential Development
Planning Board # (If available):	
Applicant Name/Info:	Westbrook Development Corporation, Thatcher Brook Apartments I, LP, Thatcher Brook Apartments II, LP
Submittal #/Type (Prelim/Final):	Final Site/Subdivision Plan
Submittal Date:	07.17.2024

ITEM NUMBER	SUBMITTAL REQUIREMENT DESCRIPTION	INFORMATION PROVIDED (YES/NO)	APPLICANT RESPONSE REASON NOT PROVIDED/COMMENT	CITY REVIEW RESPONSE	
				ACCEPTABLE (YES/NO-REVISE & RESUBMIT)	COMMENT
1	GENERAL PLAN REQUIREMENTS				
A	Drawing specific legends (linetypes, hatches, etc.)	Y			
B	Individual drawing layer control should be utilized: freeze/thawing, changing lineweights, and screening (i.e. screen existing layers on a proposed plan, freeze topography and underground utilities on a proposed site plan)	Y			
C	North arrows, standard engineering scale viewports, dated revision blocks	Y			
D	All drawings and surveys must be in the following coordinate systems: NAD83 Maine State Plane West (Horizontal) and NAVD88 (Vertical)	Y			
E	Drawings need to be designed, signed & sealed by a Maine licensed professional engineer (PE); all boundary survey data needs to be performed by a licensed professional land surveyor (PLS)	Y			
2	COVER SHEET				
A	Project Name & Property Address	Y			
B	Project Team Contact Information (Owner, Engineer, Contractor, etc.)	Y			
C	Site Location Map	Y			
D	Sheet Set List of Drawings	Y			
E	Tax Map and Lot ID	Y			
F	Zoning & Shoreland Zone Information	Y			
G	Existing Use Description	Y			
H	Proposed Use Description	Y			
I	Required Waiver/Variances (Yes/No); if yes, plan must clearly list waivers/variances requesting	N			
J	Name of Drainage Watershed	Y			
K	Within the MS4 Urbanized Area (Yes/No)	Y			
L	Natural resources (streams, wetlands, etc.) located on-site or adjacent to the property (Yes/No)	Y			
M	Within the 100-year Flood Zone (Yes/No)	N			
N	Public Road Proposed (Yes/No)	N			
O	Private Road Proposed (Yes/No)	N			
P	Public Sewer Connection (Yes/No); if yes, need to include a proposed sewer flow calculation per Maine's Subsurface Wastewater Disposal Rules, Chapter 241, Section 4 (Tables 4A & 4C)	N	Project connects to an existing onsite stormwater basin		
Q	Public Storm Drain Connection (Yes/No)	Y			
R	Limits of Disturbance in acres	Y			
S	Pervious Land Cover square footage, existing and proposed	Y			
T	Impervious Land Cover square footage (Pavement/Gravel), existing and proposed	Y			
U	Building Roof square footage, existing and proposed	Y			
V	Assigned Planning Board Number				
W	Estimated cut/fill earthwork volumes; if disturbing within Flood Zone, separate set of earthwork volumes required (site vs. within flood zone)	Y	included in estimate		
3	EXISTING CONDITIONS PLAN				
A	Horizontal & Vertical Datums annotated (NAD83 & NAVD88)	Y			
B	Survey Benchmark Locations (with XYZ Coordinates annotated)	N	Not provided on survey plan, will be provided in coordination with contractor		
C	Property & Right-of-Way Lines	Y			
D	Boundary line information (bearings, distances, etc.)	Y			
E	Property pin and monumentation locations	Y			
F	Existing easements with proper ownership identified	Y			
G	Road Names & Individual Lot Labels (Map, Lot, Owner, Acreage)	Y			
H	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Y			
I	100-year Flood Zone Limits & Elevation	N	not applicable		
J	USDA-NRCS Soil Boundaries and Labels	N	not applicable		
K	Existing contours with adequate contour labelling; minimum 1' contour interval	Y			
L	Existing building FFEs annotated	N	not applicable		
M	Spot elevations for existing building corners, door entrances, accessible parking/walkways, road centerlines, and bottom/top of curbs	N	not applicable		
N	Existing buildings & structures	Y			
O	Existing pavement areas & number of parking spaces	N	not applicable		
P	Existing ADA ramp geometry, detectable warning plates, and ADA parking spaces	N	not applicable		
Q	Existing site features (sidewalks, retaining walls, curbing, lightpoles, guide rails, dumpsters, fencing)	Y			
R	Existing signage and striping	N	not applicable		
S	Existing underground utility locations (storm, sewer, force main, water, gas, elec, tele)	Y			
T	Existing above-ground utility locations (manholes, catch basins, utility poles, hydrants, transformers, riprap)	Y			
U	Rim, invert in, invert out, pipe size, cardinal direction (N, E, S, W) information for any existing utility infrastructure being tied into (upstream/downstream/outfalls)	Y			
V	Existing tree lines, street trees, free-standing trees (12" or larger diameter at breast height), and vegetation	Y			
W	Location of any borings, drinking wells, and monitoring wells	N	Geotechnical report is forthcoming.		
4	SITE DEMOLITION & EROSION CONTROL (E&SC) PLAN				
A	Limits-of-disturbance outlined and acreage annotated	Y			
B	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Y			
C	100-year Flood Zone Limits	N	not applicable		
D	Callout existing site features to be demolished/removed/replaced	Y			
E	Callout existing utilities to be demolished/removed/abandoned-in-place	Y			
F	Hatch existing buildings and pavement to be removed	Y			
G	Construction Entrance location(s)	Y			
H	Perimeter E&SC control location(s) (i.e. silt fence, erosion berm mix)	Y			
I	Stockpile and staging area(s) identified (with proper perimeter control)	Y			
J	Inlet protection location(s)	Y			

K	Note requiring contractor to implement dust control measures throughout construction	Y			
L	Note requiring contractor to pave utility trenches within right-of-way within 3 days of excavation or prior to any rain event	Y			
M	If groundwater expected, show dewatering/silt bag location(s); show temporary pumping routing	N/A			
N	If large development is proposed with an extensive underground stormwater conveyance network, show sediment trap/basin location(s) needed for constructability/phasing; provide sizing calculations	Y			
5	SITE PLAN/SUBDIVISION PLAN				
A	Partial Site Plans needed for any viewport scale greater than 1"=20'	Y			
B	Existing property and right-of-way lines	Y			
C	Proposed subdivision lot lines and labels	Y			
D	Required Zoning Setbacks shown with dimensions and annotation	Y			
E	Bulk requirement summary table (zoning/parking calculations)	Y			
F	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Y			
G	100-year Flood Zone Limits	N	not applicable		
H	Proposed building outlines, door entrances and loading docks	Y			
I	Proposed building labels	Y			
J	Proposed road extents; provide clear annotation if roads will be public or private	N	not applicable		
K	Proposed parking and accessible parking locations; annotate parking space counts	Y			
L	Proposed signage, parking striping, and traffic striping	Y			
M	Detailed ADA ramp geometry, detectable warning surfaces, and ADA parking striping/signage; existing & proposed	Y			
N	Proposed site features (i.e. curbing, walls, fencing, guiderail, fire hydrant, transformers, light pole locations)	Y			
O	Separate hatching for buildings, sidewalks, pavement, landscaping	Y			
P	Proposed landscaping; detailed landscaping design should be on separate plans	Y	Landscape Plan by Landscape Architect to be provided with final submission.		
Q	Designated snow storage areas	Y			
R	Proposed dumpster locations and trash removal access	N	not applicable		
S	Linear dimensions of all drive aisles, sidewalk widths, parking spaces, loading docks	Y			
T	Radial dimensions for all curbs, landscaped islands, sidewalks	Y			
U	Road centerline stationing shown, labelled every 0+50' with curve data	N	not applicable		
V	If Private Road is proposed, final recorded plans must clearly note that proposed private roads will not be submitted in the future for public acceptance	N	not applicable		
W	If Private Road is proposed, final recorded plans must clearly note that the City is not responsible for any maintenance, repair, plowing, or trash removal of proposed private roads	N	not applicable		
X	Planning Board signature block for final recording	Y			
6	GRADING PLAN				
A	Partial Grading Plans needed for any viewport greater than 1"=20'	Y			
B	Limits-of-disturbance outlined and acreage annotated	Y			
C	Proposed Building Labels with Individual Finished Floor Elevations (FFE)	Y			
D	Existing contours with adequate contour labelling, screened; minimum 1' contour interval	Y			
E	Proposed contours with adequate contour labelling; minimum 1' contour interval	Y			
F	Detailed grading for all ditches, swales, outfalls, and riprap	Y			
G	All proposed contours tie-into existing contours at limits-of-disturbance outline	Y			
H	Existing spot elevations for all asphalt and curb tie-in locations	Y			
I	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Y			
J	100-year Flood Zone Limits	N	not applicable		
K	Proposed spot elevations for all important roadway geometric points and/or on a 50' maximum interval: low/high points, PC/PT, road centerline, edge-of-asphalt	N/A			
L	Proposed spot elevations for all curblines (bottom/top-of-curb) and sidewalks	Y			
M	Proposed spot elevations for all parking and drive aisle geometry points	Y			
N	Proposed spot elevations for all building corners and door-entry locations	Y			
O	Proposed retaining wall/loading dock elevations (bottom/top of wall)	Y			
P	Proposed spot elevations for all ADA ramp/landing/parking stall geometry points	Y			
Q	Proposed % slope arrows for all ADA parking spaces and sidewalks	Y			
R	Proposed longitudinal % slope arrows for drainage ditch centerlines	Y			
S	Proposed % slope arrows for roads, parking areas, and landscape tie-in areas	Y			
T	Estimated cut/fill earthwork volumes; if disturbing within Flood Zone, separate set of earthwork volumes required (site vs. within flood zone)	Y			
7	ROAD PROFILES (if public/private road proposed)	N/A			
A	Existing surface; dashed and screened				
B	Proposed surface; continuous and bold				
C	Corresponding centerline stationing and curve data annotation				
D	Road cross-section including proposed surface cross slopes; include multiple sections for various road cross slope conditions proposed (crowned, superelevated)				
E	Horizontal and vertical scale bars				
F	Clear annotation if proposed road will be public or private				
G	If Private Road is proposed, plans must clearly note that proposed private roads will not be submitted in the future for public acceptance				
H	If Private Road is proposed, plans must clearly note that the City is not responsible for any maintenance, repair, plowing, or trash removal of proposed private roads				
8	UTILITY PLAN				
A	Existing underground utility locations; screened (storm, sewer, force main, water, gas, electric, telecom)	Y			
B	Existing above-ground utility locations; screened (manholes, catch basins, utility poles, hydrants, riprap)	Y			
C	Rim, invert in, invert out, pipe size, cardinal direction (N, E, S, W) information for any existing utility infrastructure being tied into (upstream/downstream/outfalls)	Y			
D	Proposed underground utility locations; bold (storm, sewer, force main, water, gas, electric, telecom, lighting)	Y			
E	Proposed above-ground utility locations; bold (manholes, catch basins, utility poles, hydrants, transformers, riprap)	Y			
F	Proposed storm culverts, outfalls, and riprap locations and sizes	Y			
G	Storm/sewer structure labels must include: rim, inverts in, inverts out, pipe sizes, cardinal directions (N, E, S, W)	Y			
H	Storm/sewer pipe labels must include: linear footage, pipe size, material, slope	Y			
I	Flow directional arrows for storm & sewer pipes	Y			
J	Proposed & existing site features shown that could conflict with proposed utilities (trees, signs, lightpoles, bollards, foundations, guiderails)	Y			

K	All storm drains must be sized to convey the 25-year storm	Y			
L	Sewer force main sizes and invert elevations	N/A			
M	Sewer pump station locations, model, rim, inverts, pipe sizes, cardinal directions (N,E,S,W)	N/A			
N	Grease trap & oil-water separator locations, sizes, elevations	N/A			
O	Water, gas, electric, and telecom sizes labelled	Y			
9	UTILITY PROFILES				
A	Utility profiles for all gravity storm drains and sewer pipes, including all laterals, catch basins, culverts, and outfalls; profiles preferred to be aligned on the pipe centerline (not superimposed on the road centerline)	Y			
B	Existing surface; dashed and screened	Y			
C	Proposed surface; continuous and bold	Y			
D	Storm/sewer structure labels must include: rim, inverts in, inverts out, pipe sizes, cardinal directions (N, E, S, W)	Y			
E	Storm/sewer pipe labels must include: linear footage, pipe size, material, slope	Y			
F	Existing and proposed gravity pipe crossings shown; sizes labelled and depths/clearance annotated	Y			
G	Existing and proposed electric/water/telecom/gas crossings shown at approximate depths; sizes labelled and depths/clearance annotated	Y			
H	Known ledge or groundwater elevations	Y			
I	For all storm drains, 25-year HGL must be shown on profiles with starting tailwater condition identified	Y			
J	For storm outfalls, include riprap sizing and grading extents	Y			
K	Horizontal and vertical scale bars	Y			
10	DETAILS				
A	Road section detail, including pavement & gravel depths	Y			
B	Sidewalk, paver, crosswalk, and any other pavement section details	Y			
C	Pavement sawcut detail	Y			
D	Utility trench/backfill detail	Y			
E	All site feature details; curbing, retaining walls, fencing, guiderails, dumpsters, etc.	Y			
F	Signage, striping, and ADA details	Y			
G	E&S notes and details; only show applicable/proposed measures	Y			
H	Utility structure details (manholes, cleanouts, fittings, handholes, transformer pads, hydrants)	Y			
I	Storm outfall & riprap details	Y			
J	Drainage ditch cross section identifying minimum depth, minimum bed width, and maximum side slopes	Y			
K	Pump station, grease trap, and oil-water separator details	N/A			
L	Conduit section details	Y			
M	Miscellaneous details (as needed)	Y			
11	LANDSCAPING, LIGHTING & PHOTOMETRIC PLANS				
A	As required by ordinance; at a minimum: locations, counts, and species/models must be identified	Y			
B	Landscaping & lighting details	Y			
12	DOCUMENTS/REPORTS/CALCULATIONS				
A	On initial preliminary submittal applications, applicant must submit a development review and inspection fee. Applicant to coordinate fee amount with City Planner prior to submittal. This fee will be drawn against to cover the following type of services throughout the project life cycle (and may require replenishing): i. 3rd Party City Peer-Review ii. Site Inspections during the permitting process iii. Erosion & Sediment Control Inspections during construction iv. Right-of-Way Inspections during construction v. Site Punchlist/As-Built Inspections post-construction	Y			
B	Predevelopment & Post-development Drainage Area Maps, including: i. Subdrainage areas delineated and labeled ii. Points of Interest/Analysis shown and labeled iii. Hatching for different land cover areas (impervious, pervious, gravel) iv. Time of concentration (Tc) paths & durations v. Four City-standardized stormwater summary tables	N	not applicable. See stormwater memo for analysis.		
C	An approved 'Sewer Ability-to-Serve Letter' from the Engineering Department: i. Applicant to submit proposed sewer flow calculations per Maine's Subsurface Wastewater Disposal Rules, Chapter 241, Section 4 (Tables 4A & 4C)	N	Ability to serve requested. Waiting for final review from City.		
D	A Performance Guarantee Cost Estimate utilizing Planning's template				
E	For any Site Location of Development (SLODA) project, the applicant's submittal must mimic a formal submittal to DEP. Submit must abide to DEP's SLODA application and include DEP's SLODA Submittal Checklist (Form D)	N	not applicable		
F	25-year hydraulic calculations for all storm conveyance infrastructure (pipes, culverts, drainage ditches) via the rational method; starting tailwater conditions/documentation must be clearly identified	Y			
G	If any SWM water quality BMP or detention facility is proposed, hydrologic model exports/hydrographs must be submitted for the for the 2, 10, 25, & 100-year storm frequencies	N			
H	Sizing calculations for any SWM water quality BMP or detention facility	N			
I	A stormwater maintenance manual for any proposed SWM water quality BMP or detention facility, including: i. Annual maintenance requirements ii. Annual inspection requirements by a licensed PE; noting that all inspection reports/logs need to be submitted to the Engineering Department by March 1st each following year, identifying what on-going maintenance has occurred and what remedial repairs are needed iii. Signed Property Owner Agreement: including the current property owner's contact information and signature; it must be noted that all stormwater BMP maintenance requirements are linked to the property for perpetuity and transfer to any new ownership	N			
J	Salt Management Plan	N/A			
K	Sewer pump station sizing calculations	N/A			
L	Sewer pump station maintenance plan	N/A			
M	Grease trap sizing calculations	N/A			
N	Homeowner Association (HOA) agreement for any private road serving two (2) lots or more	N/A			
O	Summary list & copy of any required DOT/DEP/USACE permits & approvals	N/A			

Whitten, Nan

From: Tom Saucier <tsaucier@sitedesignassociates.biz>
Sent: Thursday, August 1, 2024 11:35 AM
To: Galbraith, David; Whitten, Nan; Chekan, Craig
Subject: 37 Barra Road

EXTERNAL: This email originated from outside of the City of Biddeford email system. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hello

We have undertaken a review of the revised plans and documentation submitted on Tuesday, July 30, in response to our July 23 review comments. Based on our review, it appears the majority of our comments have been addressed. We provide the following comments for your and the planning board's consideration:

1. In regards to the existing wet pond, the applicant has indicated a willingness to provide pond maintenance subject to discussions with the city and to restore the pond to the original design conditions. They further find that they have demonstrated that the pond has the capacity to convey the 25 year storm event, and that the emergency spillway can convey the 100 year storm event with 1 ft of freeboard. They conclude that the stormwater management for the property will be sufficiently handled per the original design to provide water quality and quantity treatment.

In the interest of providing our comments in an expeditious manner, we have not yet had the opportunity to review the stormwater analysis that supports this conclusion in detail. If the city would like us to review this information further, we suggest that a condition of approval stating such would be appropriate.

2. The applicant acknowledges that items B.1.b. and B.2.a. of our review comments require coordination and further clarification relative to easements on the site.
3. Our comment B.2.b. questioned whether there should be spaces for turning around at ends of each of the dead end parking lots. The response indicated that the upper parking area adjacent to the aged restricted building will have a striped loading zone at the sidewalk curb ramp. Is this a reference to the 7 ft wide cross hatched area shown mid lot on the northerly side? If so, this would not be adequate for a turnaround, and the location mid lot still requires backing from the end of the lot to the space, increasing the potential for conflicts. We also shared a concern regarding the lower lot, but the applicant's response was generally the lots owned and operated by the applicant are "under-parked."
4. The plans and response to our comment B.3.a. indicate there will be no access to a sidewalk from the accessible parking aisles. Occupants will have to use the accessible aisle adjacent to the parking space to access the vehicular parking lot aisle in order to make their way to a sidewalk located between the bays of accessible parking.
5. Our comment B.3.e. questioned whether there should be a fence at the top of the northerly retaining wall which ranges in height from 1.5 to 11.25 ft in height. It does not appear this comment received a response. It seems a fence at the top of the wall would be an inexpensive means of reducing the potential for falls from the top of the wall, whether or not there are pedestrian facilities at the top of the wall.
6. Is detail B on drawing 6.3 intended to represent the fire access typical section?

If you require additional information or clarification please do not hesitate to contact me.

Thanks
Tom

Tom Saucier, P.E.
Site Design Associates
23 Whitney Way
Topsham, Maine 04086
207-449-4275