



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

City/Town

Important:

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



Note:
Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (Note: electronic filers will click on button to locate project site):

93 Sunnyside Avenue

Arlington

02474

a. Street Address

b. City/Town

c. Zip Code

Latitude and Longitude:

42.410930

-71.133160

34-3

d. Latitude

e. Longitude

18

f. Assessors Map/Plat Number

g. Parcel /Lot Number

2. Applicant:

Lynne

Cooney

a. First Name

b. Last Name

c. Organization

93 Sunnyside Avenue

d. Street Address

Arlington

MA

02474

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email Address

3. Property owner (required if different from applicant):

☐ Check if more than one owner

Same as above.

a. First Name

b. Last Name

c. Organization

d. Street Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email address

4. Representative (if any):

None

a. First Name

b. Last Name

c. Company

d. Street Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

\$310.00

\$42.50

267.50

a. Total Fee Paid

b. State Fee Paid

c. City/Town Fee Paid



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A. General Information (continued)

6. General Project Description:

see attached project narrative

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

- | | |
|---|---|
| 1. <input checked="" type="checkbox"/> Single Family Home | 2. <input type="checkbox"/> Residential Subdivision |
| 3. <input type="checkbox"/> Commercial/Industrial | 4. <input type="checkbox"/> Dock/Pier |
| 5. <input type="checkbox"/> Utilities | 6. <input type="checkbox"/> Coastal engineering Structure |
| 7. <input type="checkbox"/> Agriculture (e.g., cranberries, forestry) | 8. <input type="checkbox"/> Transportation |
| 9. <input type="checkbox"/> Other | |

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☐ Yes ☒ No If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR 10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

South Middlesex

a. County

73753

b. Certificate # (if registered land)

38

c. Book

d. Page Number

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

- ☐ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
- ☒ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.



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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. <input type="checkbox"/> Bank	1. linear feet	2. linear feet
b. <input type="checkbox"/> Bordering Vegetated Wetland	1. square feet	2. square feet
c. <input type="checkbox"/> Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. <input checked="" type="checkbox"/> Bordering Land Subject to Flooding	1. square feet 4.28 Cubic Ft. 3. cubic feet of flood storage lost	2. square feet 8.56 Cubic Ft. 4. cubic feet replaced
e. <input type="checkbox"/> Isolated Land Subject to Flooding	1. square feet 2. cubic feet of flood storage lost	3. cubic feet replaced
f. <input checked="" type="checkbox"/> Riverfront Area	Alewife Brook 1. Name of Waterway (if available) - specify coastal or inland	

2. Width of Riverfront Area (check one):

- ☐ 25 ft. - Designated Densely Developed Areas only
- ☐ 100 ft. - New agricultural projects only
- ☐ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: 2983 sq. ft.
square feet

4. Proposed alteration of the Riverfront Area:

a. total square feet	b. square feet within 100 ft.	increase in impervious surface c. square feet between 100 ft. and 200 ft.
----------------------	-------------------------------	--

5. Has an alternatives analysis been done and is it attached to this NOI? ☒ Yes ☐ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☒ Yes ☐ No

3. ☐ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f.** above.



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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users:
Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

<u>Resource Area</u>	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
a. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. <input type="checkbox"/> Land Under the Ocean	1. square feet _____ 2. cubic yards dredged _____	
c. <input type="checkbox"/> Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. <input type="checkbox"/> Coastal Beaches	1. square feet _____	2. cubic yards beach nourishment _____
e. <input type="checkbox"/> Coastal Dunes	1. square feet _____	2. cubic yards dune nourishment _____
	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
f. <input type="checkbox"/> Coastal Banks	1. linear feet _____	
g. <input type="checkbox"/> Rocky Intertidal Shores	1. square feet _____	
h. <input type="checkbox"/> Salt Marshes	1. square feet _____	2. sq ft restoration, rehab., creation _____
i. <input type="checkbox"/> Land Under Salt Ponds	1. square feet _____	
	2. cubic yards dredged _____	
j. <input type="checkbox"/> Land Containing Shellfish	1. square feet _____	
k. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above	
	1. cubic yards dredged _____	
l. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	1. square feet _____	
4. <input type="checkbox"/> Restoration/Enhancement	If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.	
	a. square feet of BVW _____	b. square feet of Salt Marsh _____
5. <input type="checkbox"/> Project Involves Stream Crossings		
	a. number of new stream crossings _____	b. number of replacement stream crossings _____



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C. Other Applicable Standards and Requirements

- ☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

- a. ☐ Yes ☒ No **If yes, include proof of mailing or hand delivery of NOI to:**

Natural Heritage and Endangered Species Program
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

b. Date of map _____

If yes, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

- c. Submit Supplemental Information for Endangered Species Review*

1. ☐ Percentage/acreage of property to be altered:

(a) within wetland Resource Area

percentage/acreage _____

(b) outside Resource Area

percentage/acreage _____

2. ☐ Assessor's Map or right-of-way plan of site

2. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

(a) ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)

(b) ☐ Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/>). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.



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C. Other Applicable Standards and Requirements (cont'd)

- (c) ☐ MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhosp/regulatory_review/ mesa/ mesa_fee_schedule.htm).
Make check payable to "Commonwealth of Massachusetts - NHESP" and **mail to NHESP** at above address

Projects altering 10 or more acres of land, also submit:

- (d) ☐ Vegetation cover type map of site
- (e) ☐ Project plans showing Priority & Estimated Habitat boundaries
- (f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/dfwele/dfw/nhosp/regulatory_review/ mesa/ mesa_exemptions.htm; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing. a. NHESP Tracking # _____ b. Date submitted to NHESP _____

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

- a. ☒ Not applicable – project is in inland resource area only b. ☐ Yes ☐ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: DMF.EnvReview-South@state.ma.us

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: DMF.EnvReview-North@state.ma.us

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.



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C. Other Applicable Standards and Requirements (cont'd)

Online Users:
Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?
a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.
- b. ACEC
5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?
a. ☐ Yes ☒ No
6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?
a. ☐ Yes ☒ No
7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?
a. ☐ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:
1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)
2. ☐ A portion of the site constitutes redevelopment
3. ☐ Proprietary BMPs are included in the Stormwater Management System.
b. ☒ No. Check why the project is exempt:
1. ☒ Single-family house
2. ☐ Emergency road repair
3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

- ☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☐ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
2. ☐ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.



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D. Additional Information (cont'd)

3. ☐ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

Topographic Plan of Land

a. Plan Title

Medford Survey Inc.

Richard J. Mead Jr.

b. Prepared By

1.17.2020

c. Signed and Stamped by

1" = 20'

d. Final Revision Date

See application packet.

e. Scale

f. Additional Plan or Document Title

g. Date

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.
6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.
7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.
8. ☒ Attach NOI Wetland Fee Transmittal Form
9. ☐ Attach Stormwater Report, if needed.

E. Fees

1. ☐ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

2. Municipal Check Number

February 10, 2020

3. Check date

February 10, 2020

4. State Check Number

Lynne

5. Check date

Cooney

6. Payor name on check: First Name

7. Payor name on check: Last Name



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F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

Lynne Cooney

1. Signature of Applicant

2/13/2020

2. Date

3. Signature of Property Owner (if different)

4. Date

5. Signature of Representative (if any)

6. Date

For Conservation Commission:

Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:

One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:

If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.



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NOI Wetland Fee Transmittal Form
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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



A. Applicant Information

1. Location of Project:

93 Sunnyside Avenue

Arlington, MA 02474

b. City/Town

\$42.50

d. Fee amount

c. Check number

2. Applicant Mailing Address:

Lynne

Cooney

a. First Name

b. Last Name

c. Organization

93 Sunnyside Avenue

d. Mailing Address

Arlington

MA

f. State

02474

g. Zip Code

h. Phone Number

i. Fax Number

j. Email Address

3. Property Owner (if different):

Same as Above

a. First Name

b. Last Name

c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email Address

B. Fees

Fee should be calculated using the following process & worksheet. **Please see Instructions before filling out worksheet.**

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract \$12.50. To calculate the city/town share of the fee, divide the total fee in half and add \$12.50.

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).



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B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Work on Single Family House + Additon	1	\$110.00	\$110.00
Step 5/Total Project Fee:			\$110.00

Step 6/Fee Payments:

	\$110.00
Total Project Fee:	a. Total Fee from Step 5
	\$42.50
State share of filing Fee:	b. 1/2 Total Fee less \$12.50
	\$67.50
City/Town share of filing Fee:	c. 1/2 Total Fee plus \$12.50

C. Submittal Requirements

- a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

- b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

NOI Application Project Narrative
Lynne Cooney
93 Sunnyside Avenue, Arlington, MA 02474

General Project Description

Proposed interior renovations and two-story rear addition to existing 2 Bedroom, 1 Bathroom single family unit, which is part of an attached 2-family structure. Project includes kitchen and bedroom addition off rear (180 sq. ft.) and expansion of existing entry mudroom (from 17 sq. ft. to 46 sq. ft.). New elevated deck also proposed constructed off of the new rear addition (145 sq. ft.). Existing rear concrete slab and knee walls to be reused at deck structure.

Back elevated addition will increase impervious surface area by 180 sq. ft. and front addition would increase impervious surface area by 29 sq. ft. for a total increase in impervious area of 209 sq. ft. This increase in impervious area is within the 200-foot riverfront area and the 180 sq. ft. expansion is within the floodplain. Back elevated addition will be built above the floodplain with footings not foundation. The new footings will take up 4.28 cubic feet of floodplain. 8.56 cubic ft. of soil will be removed from the floodplain as compensatory flood storage.

Proposed driveway (284 sq. ft.) of permeable pavers (Unilock Eco-Priora materials packet included with proposal packet) will be installed on 1" bedding sand over 8" minimum of aggregate gravel base to reduce the amount of stormwater runoff.

400 sq. ft. of vegetation buffer at rear of property will replace existing grass yard and act as mitigation for this project in the 200-foot riverfront area. Three new drywells will also be installed as stormwater mitigation. Drywells will capture all roof square footage including current roof and new back & front addition.

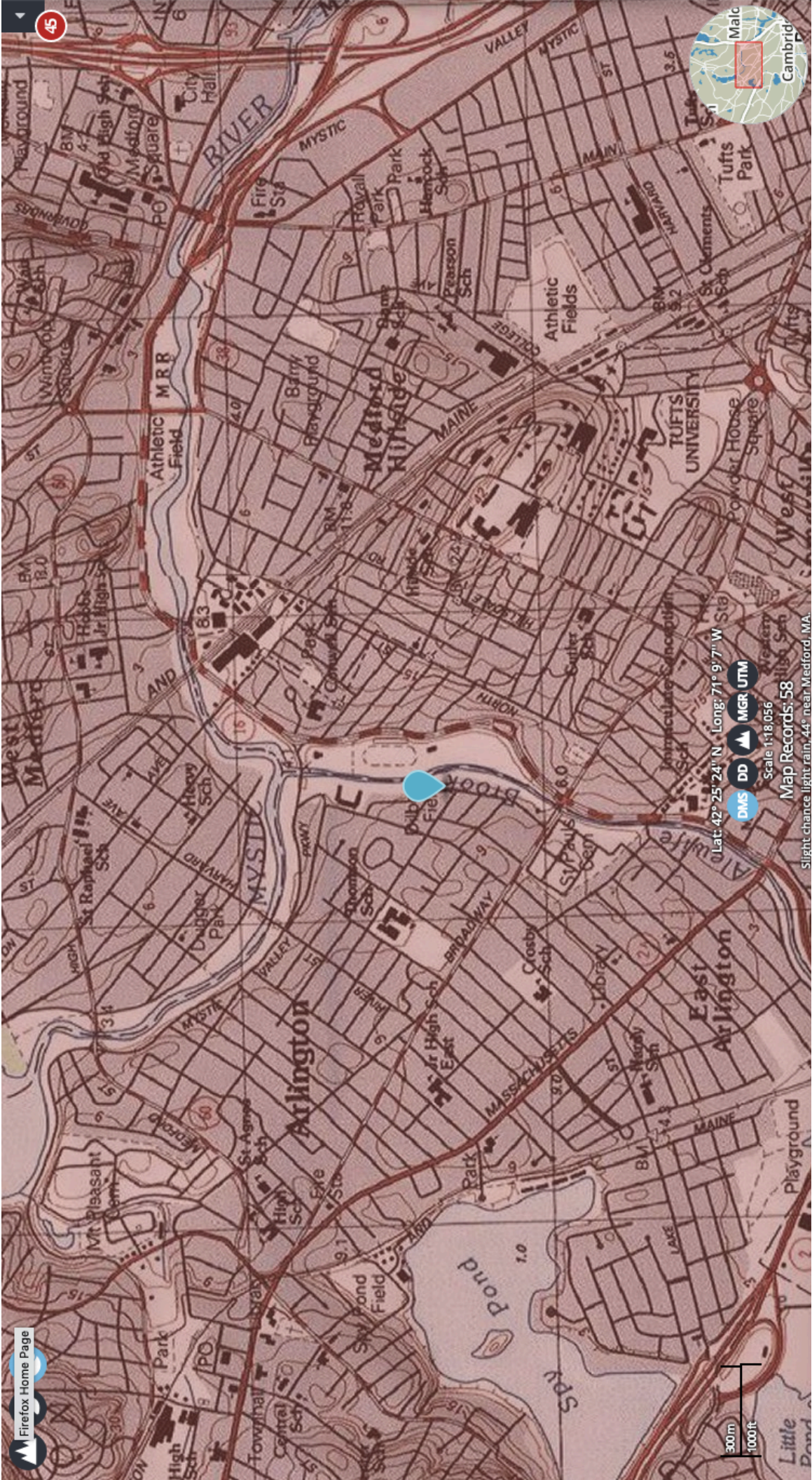
Climate Change Resilience (in accordance with Section 31 of the Arlington Regulations for Wetlands Protection).

1. This project limits storm and flood damage by building above the floodplain, with minimal floodplain encroachment. The back addition will be built on footings, not on a foundation. The total floodplain encroachment is 4.28 cubic feet, and will be mitigated by creating 8.56 cubic feet of compensatory flood storage. Additionally, this project proposes adding three new drywells to the site, reducing stormwater runoff. Finally, this project proposes to create a 400 square foot vegetated buffer zone with native plantings close to the 100-foot wetlands buffer. The native plantings will mitigate stormwater runoff better than the existing grass yard and create better quality wildlife habitat.

2. This project proposes to mitigate stormwater runoff and enhance stormwater quality through three interventions: The addition of three new drywells, a new 400 square foot vegetated buffer area, and a new permeable paver driveway (described above). These interventions will control stormwater runoff and infiltrate runoff such that nutrients and pollutants will be removed prior to entering Alewife Brook.

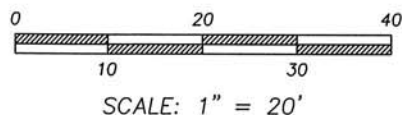
3. The 400 square foot vegetated buffer will include native plants. The water table on this site is high, so plants will be selected such that they can tolerate both dry and wet conditions. Pollinator plants will also be planted to encourage enhanced wildlife habitat. This project will include the removal of non-native plants from overgrown areas (without the use of chemicals or toxic sprays) and planting native vegetation buffer along the border of riverfront area on back of property. Supplemental landscaping to front of house to include pruning existing shrubs (not more than 20% per the Commission's regulations) and adding native shrubbery and vegetation.

3. This project minimizes the impacts of climate change on the structure by building the addition and deck above the floodplain, improving stormwater management, and increasing vegetative cover onsite.



0 Lat: 42° 25' 24" N • Long: 71° 9' 7" W
Scale 1:18,056
Map Records: 58
Slight chance light rain, 44° near Medford, MA.

DMS DD MGR UTM



CURRENT OWNER: JEFFREY STERN
TITLE REFERENCE: BK 26089 PG 364
PLAN REFERENCE: 1049 OF 1948

THIS PLAN WAS PREPARED WITHOUT A FULL TITLE EXAMINATION AND IS NOT A CERTIFICATION TO THE TITLE OF THE LANDS SHOWN. THE OWNERSHIP OF ABUTTING PROPERTIES IS ACCORDING TO ASSESSORS RECORDS. THIS PLAN MAY OR MAY NOT SHOW ALL ENCUMBRANCES WHETHER EXPRESSED, IMPLIED OR PRESCRIPTIVE.

SURVEYOR'S CERTIFICATION:

TO: TIMOTHY BLANCHARD

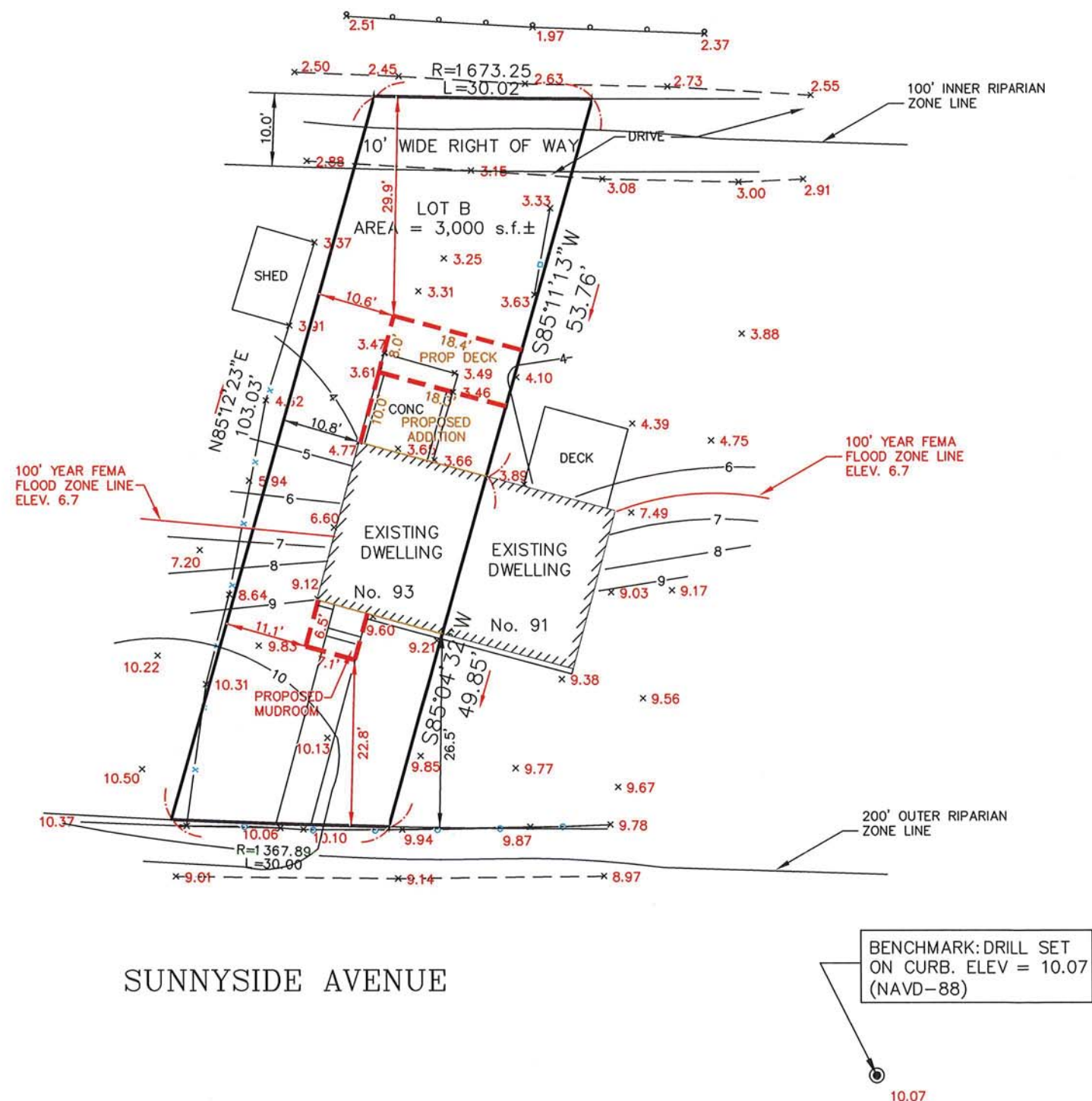
I CERTIFY THAT THIS PLAN AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE GENERALLY ACCEPTABLE PRACTICES OF LAND SURVEYORS IN THE COMMONWEALTH OF MASSACHUSETTS FOR A PLAN AND SURVEY OF THIS TYPE. THIS CERTIFICATION IS MADE ONLY TO THE ABOVE NAMED INDIVIDUAL(S) AND IS NULL AND VOID UPON ANY FURTHER CONVEYANCE OF THIS PLAN.

THE FIELD WORK WAS COMPLETED ON: JANUARY 15, 2020
DATE OF PLAN: JANUARY 17, 2020


RICHARD J. MEDE, JR. P.L.S.

01/17/2020

DATE:



TOPOGRAPHIC PLAN OF LAND
93 SUNNYSIDE AVE
ARLINGTON, MA.
(MIDDLESEX COUNTY)

PREPARED BY:

**MEDFORD
ENGINEERING
& SURVEY**

ANGELO B. VENEZIANO ASSOCIATES
15 HALL STREET, MEDFORD, MA 02155
781-396-4466 fax: 781-396-8052

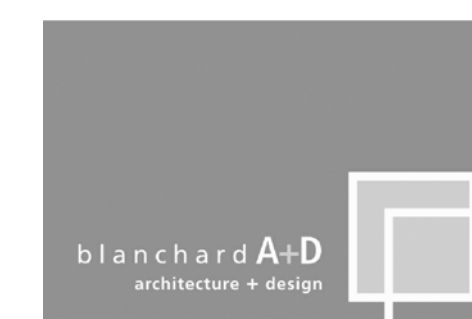
PREPARED FOR:

TIMOTHY BLANCHARD

DRAWN	CHECKED	FILE No.
CAV	RJM	20706

**GREENBLATT
- COONEY
RESIDENCE**

93 SUNNYSIDE AVENUE
ARLINGTON, MA 02474



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661 MASSACHUSETTS AVENUE
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tblanchard@gmail.com
TELEPHONE 617-519-5434

NOT FOR
CONSTRUCTION



GREENBLATT
- COONEY
RESIDENCE

93 SUNNYSIDE AVENUE
ARLINGTON, MA 02474



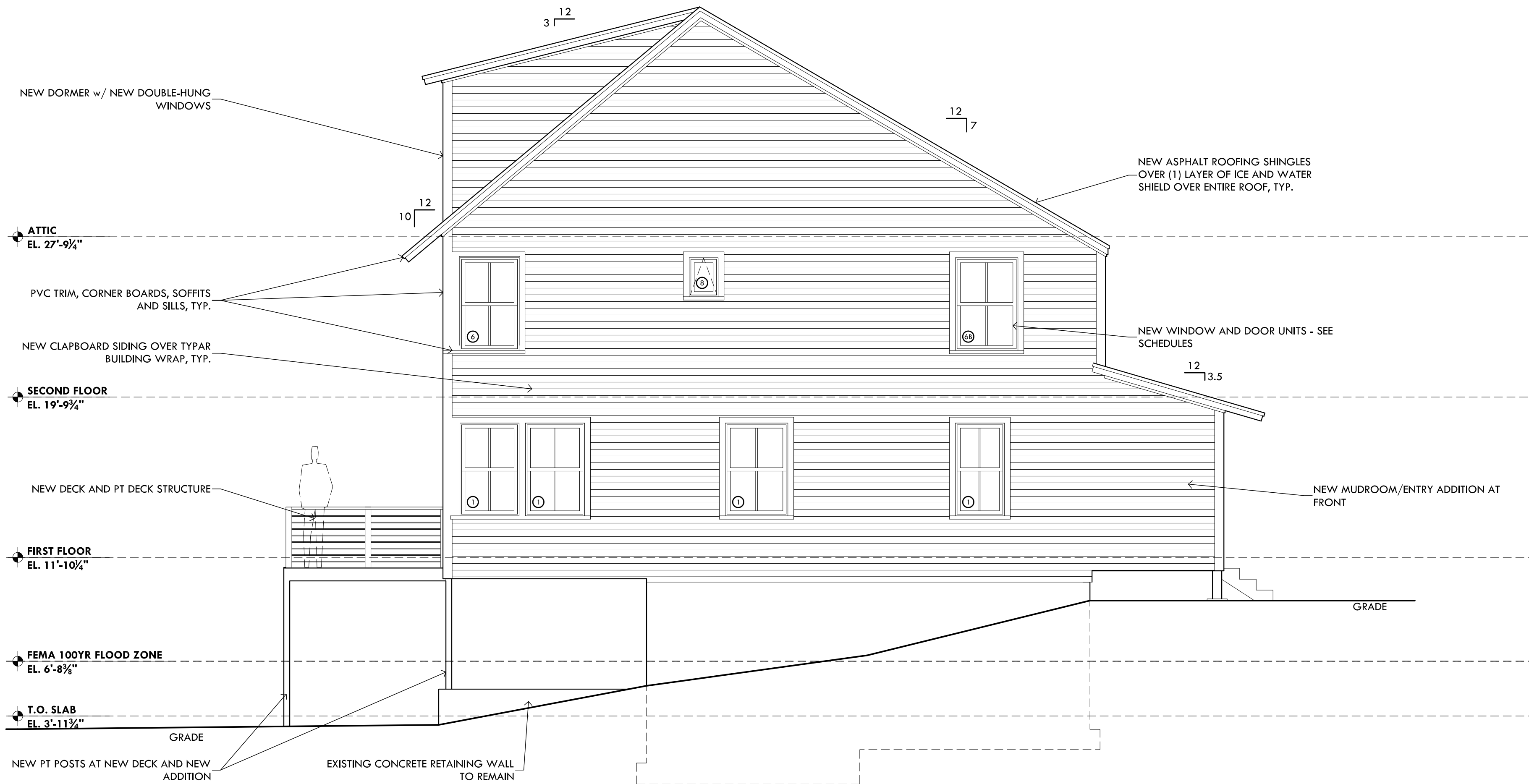
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02/10/20 CONSERVATION COMMISSION		
No	Date	Revision / Issue
Project Number	Scale	
1908	AS NOTED	
Drawn By	Checked By	
tb	tb	
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PROPOSED
EXTERIOR
ELEVATIONS

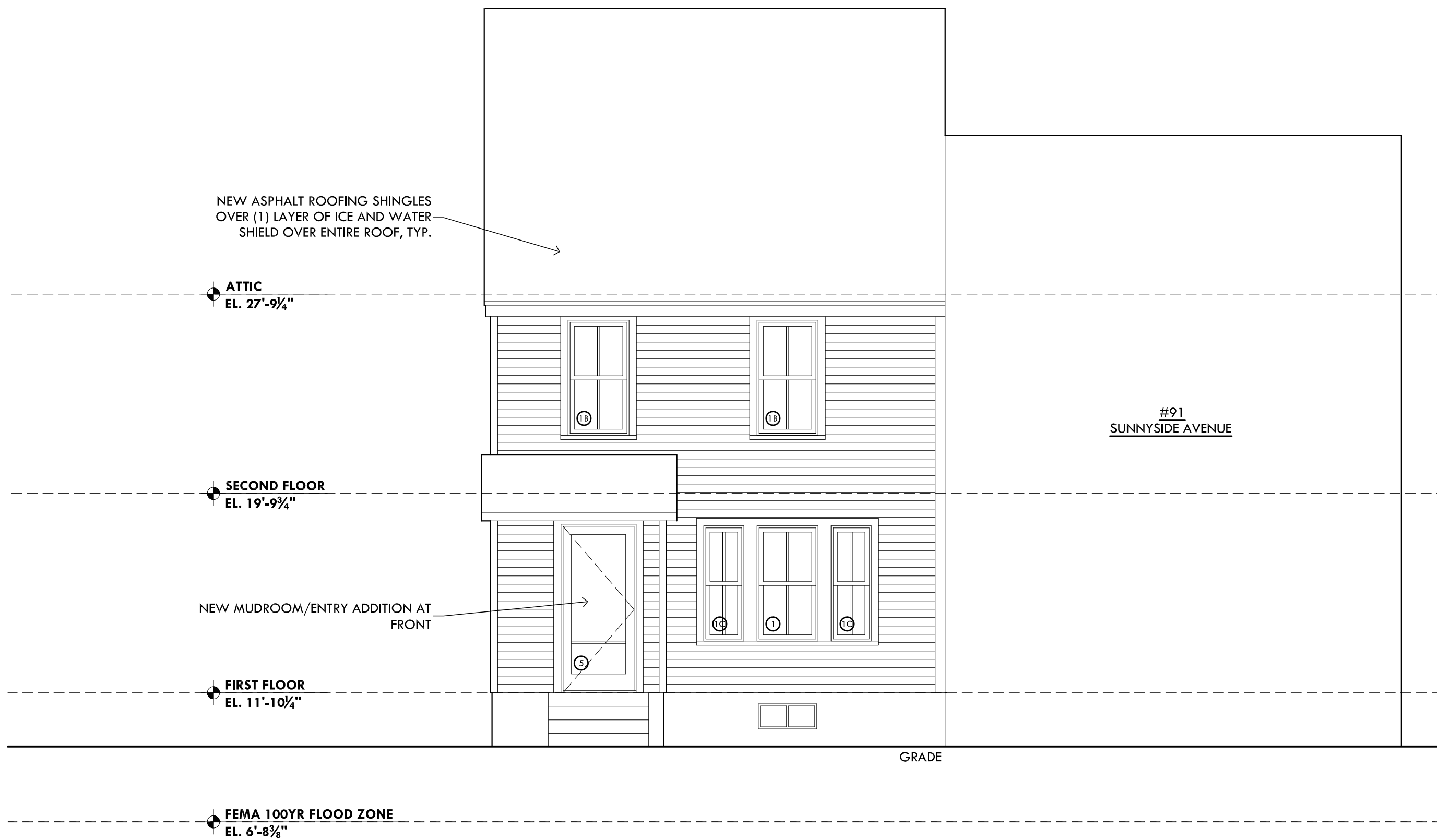
A3.0



PROPOSED NORTH ELEVATION

1/4" = 1'-0"

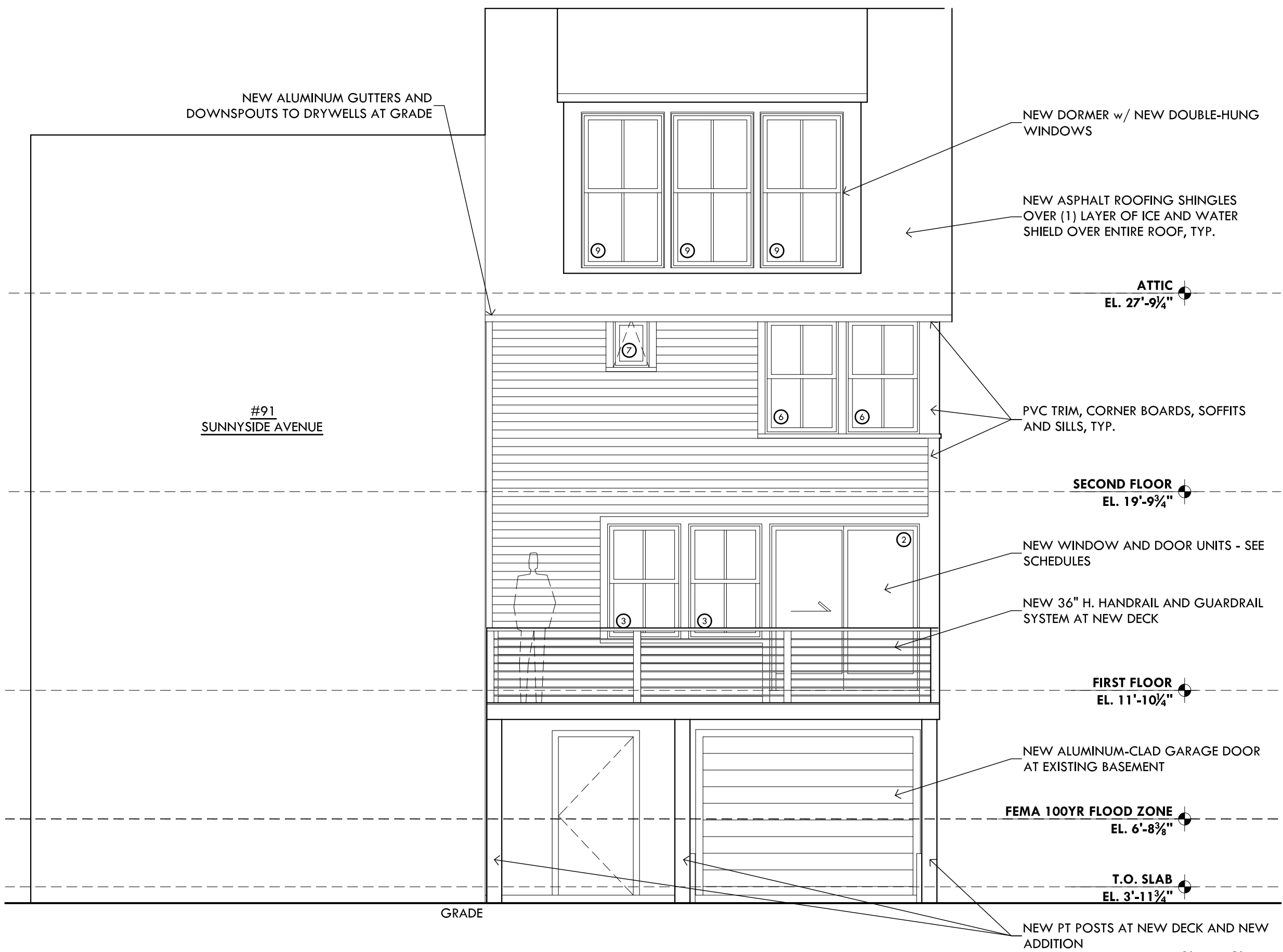
A



PROPOSED EAST ELEVATION

1/4" = 1'-0"

B



PROPOSED WEST ELEVATION

1/4" = 1'-0"

C



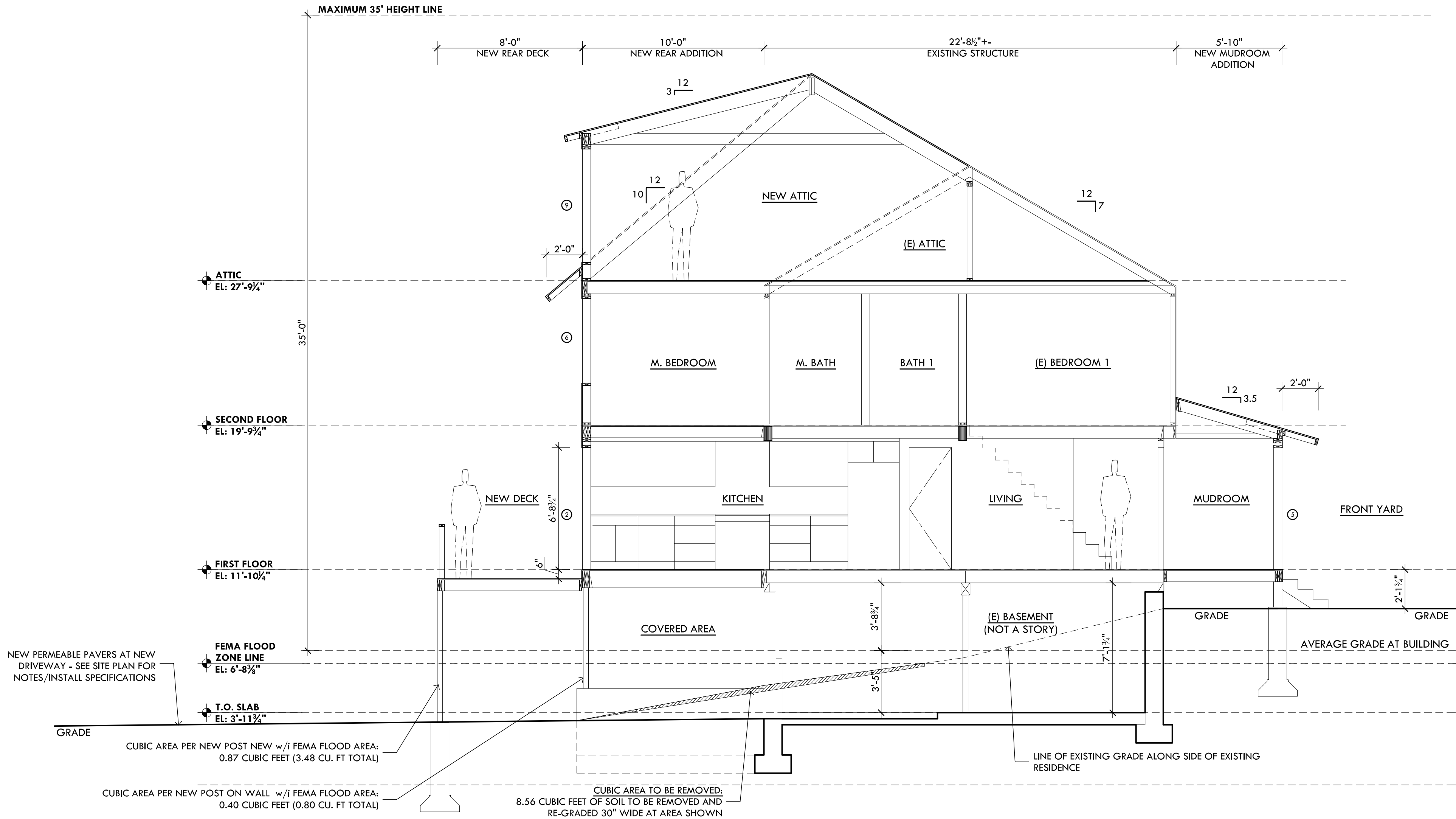
GREENBLATT
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NOT FOR
CONSTRUCTION



EAST-WEST SECTION AT KITCHEN/LIVING

1/4" = 1'-0"

A

02/13/20 CONSERVATION COMMISSION		
No	Date	Revision / Issue
Project Number		
1908		AS NOTED
Drawn By		
tb		tb
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BUILDING
SECTIONS



A4.0

ECO-PRIORA™

Architectural design with engineered performance.

Designed with special spacer bars, the resulting 7mm gap is filled with a clear, fine stone chip that allows rapid penetration of rainwater into the sub-base and subsoil.



**COFFEE CREEK
STANDARD FINISH**
SPECIAL ORDER



**GRANITE BLEND
STANDARD FINISH**



**SIERRA
STANDARD FINISH**



**COFFEE CREEK
TUMBLED FINISH**
SPECIAL ORDER



**GRANITE BLEND
TUMBLED FINISH**
SPECIAL ORDER



**SIERRA
TUMBLED**
SPECIAL ORDER



**AUTUMN SUNSET
UMBRIANO FINISH**
SPECIAL ORDER



**MIDNIGHT SKY
UMBRIANO FINISH**
SPECIAL ORDER



**SUMMER WHEAT
UMBRIANO FINISH**
SPECIAL ORDER



**WINTER MARVEL
UMBRIANO FINISH**
SPECIAL ORDER



10"X10"
24 CM X 24 CM X 8 CM
9.5" X 9.5" X 3.125"



5"X10"
24 CM X 12 CM X 8 CM
9.5" X 4.75" X 3.125"



5"X5"
12 CM X 12 CM X 8 CM
4.75" X 4.75" X 3.125"

	Unit	SqFt Per			Per Bundle	Soldier LnFt Per		Sailor LnFt Per		Units Per		Lbs Per	
Stones & Bundling	Thickness	Bundle	Layer	Stone	Layers	SqFt	Bundle	SqFt	Bundle	SqFt	Bundle	Layers	Bundle
10"x10"	3-1/8" (8cm)	86.6	12.37	0.619	7	0.786	110.2	0.79	110.24	1.62	140	443	3099
5"x10"	3-1/8" (8cm)	74.59	10.66	0.304	7	0.773	96.4	0.39	192.89	3.28	245	381	2669
5"x5"	3-1/8" (8cm)	74.59	10.66	0.152	7	0.387	192.9	0.39	192.89	6.57	490	381	2669

Sold in full bundles only and shipped on refundable skids. Eco-Priora is available in Series 3000 and Umbriano finishes. Minimum quantities apply on custom orders. Textured surfaces require a buffer between the plate compactor and the paver surface to prevent scuffing. Specially graded aggregates must be used for the joints. Contact Unilock for more information.



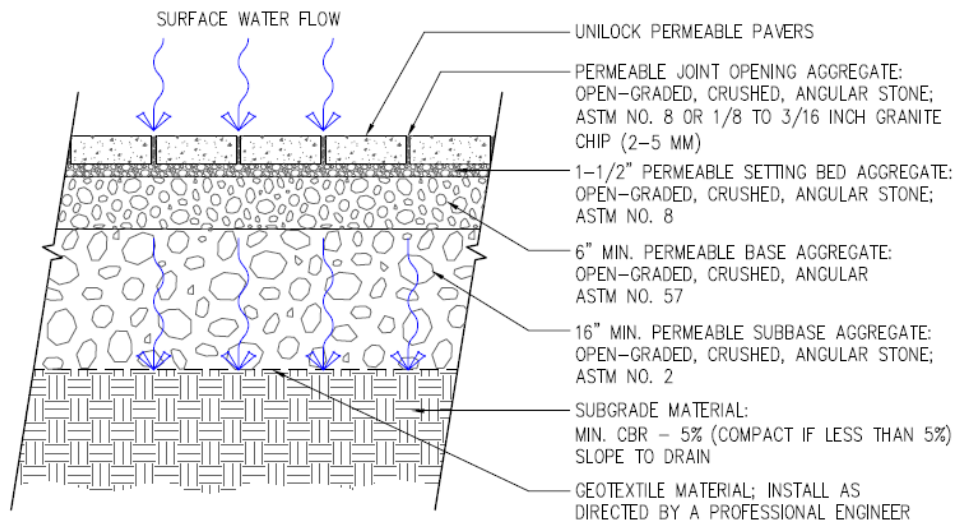
Eco-Priora H
5"x10" (50%)
10"x10" (50%)

Eco-Priora E
5"x10"(100%)

32-14-13.19

Unilock Permeable

For any additional information or assistance with this spec please contact your Unilock Representative.



***** Delete all text in RED after modifying the text in BLUE. All BLUE text requires modification. *****

FOREWORD

These specifications have been prepared for the general guidance of architects, landscape architects, engineers, contractor and superintendents associated with the construction of interlocking concrete pavements. Consult with a licensed architect, landscape architect or engineer to determine the suitability of the design, confirm site conditions and monitor the installation in critical applications. Unilock is not responsible for the information in this specification meeting local or national building codes. The Architect, Landscape Architect or Engineer of Record is responsible selecting products that meet any and all building code requirements to gain occupancy permit and updating this specification as necessary.

INTRODUCTION

Unilock® permeable pavers are manufactured in a variety of shapes and colors for residential, commercial, municipal and industrial applications. They offer design professionals several engineered pavement systems that are efficient, durable, economical and aesthetically attractive.

Unilock® permeable pavers are manufactured to tight dimensional tolerances. This, in combination with their permeable and interlocking capabilities, allows the surface to be completely porous with a high resistance to compressive loads and lateral forces.

SECTION 32 14 13.19

PERMEABLE CONCRETE PAVER MATERIALS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes the following:
 - 1. Permeable Concrete Pavers
 - 2. Permeable Joint Opening Aggregate
 - 3. Permeable Joint Aggregate Type 1
 - 4. Permeable Joint Aggregate Type 2
 - 5. Permeable Setting Bed Aggregate (Open-graded)
 - 6. Permeable Base Aggregate (Open-graded)
 - 7. Permeable Subbase Aggregate (Open-graded)

1.02 REFERENCES

Note: Design street, industrial, port and airport pavement thicknesses in consultation with a qualified civil engineer, in accordance with established flexible pavement design procedures, LOCKPAVE® software, and in accordance with Interlocking Concrete Pavement Institute Technical Bulletins. Sample construction detail drawings are available from Unilock®. This specification may require modifications.

- A. ASTM International, latest edition:
 - 1. C 29 Bulk Density and Voids in Aggregate Materials.
 - 2. C 33, Standard Specification for Concrete Aggregates.
 - 3. C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - 4. C 140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
 - 5. D 448, Standard Classification for Sizes of Aggregate for Road and Bridge Construction.
 - 6. C 936, Standard Specification for Solid Concrete Interlocking Paving Units.
 - 7. C 979, Standard Specification for Pigments for Integrally Colored Concrete.

8. D 698 Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 5.5 lb (24.4 N) Rammer and 12 in. (305 mm) drop.
9. D 1557 Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 10-lb (44.5 N) Rammer and 18 in. (457 mm) drop.
10. C1645 Standard Test Method for Freeze-thaw and De-icing Salt Durability of Solid Concrete Interlocking Paving Units
11. D 4254, Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
12. D 4632, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
13. D 4533, Standard Test Method for Index Trapezoidal Tearing Strength of Geotextiles
14. D 4833, Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products
15. D 4491, Standard Test Method for Water Permeability of Geotextiles by Permittivity
16. D 4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile

Delete the BLUE text above if no geotextile is being utilized.

Note: In order to determine the latest version of the listed specifications and standards, please consult the ASTM web page (www.astm.com)

- B. U.S. Green Building Council Leadership in Energy and Environmental Design (LEED)
1. Building Design + Construction, latest edition

1.03 SUBMITTALS

- A. Permeable Concrete Pavers:
1. Samples for verification: Three representative full-size samples of each paver type, thickness, color and finish that indicate the range of color variation and texture expected upon project completion.
 2. Accepted samples become the standard of acceptance for the product produced.
 3. Test results from an independent testing laboratory for compliance of concrete pavers with ASTM C 936.
 4. Manufacturer's catalog product data, installation instructions, and material safety data sheets for the safe handling of the specified materials and products.
- B. Permeable Joint Opening Aggregate:
1. Provide three representative one pound samples in containers of aggregate materials that indicate the range of color variation and texture expected upon project completion.
 2. Accepted samples become the standard of acceptance for the product produced.
 3. Test results from an independent testing laboratory for sieve analysis, including washed gradations per ASTM C 136.
 4. Test results for void space percentage per ASTM C 29.
- C. Permeable Setting Bed, Base and Subbase Aggregate:
1. Test results from an independent testing laboratory for compliance with ASTM D 448 No. 8, No. 57 and No. 2.
 2. Test results from an independent testing laboratory for sieve analysis, including washed gradations per ASTM C 136.
 3. Test results for void space percentage per ASTM C 29.
- D. Paving Installation Contractor:
1. Job references from a minimum of three projects similar in size and complexity. Provide Owner/Client/General Contractor names, postal address, phone, fax, and email address.
- E. LEED (required only for LEED projects, delete otherwise)
1. LEED Materials and Resources Credit 4, Recycled Materials: Submit letter from manufacturer certifying the products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content.

- a. Include statement indicating costs for each product having recycled content.
- 2. LEED Materials and Resources Credit 5, Regional Materials: Submit letter from manufacturer certifying products having been extracted, harvested, or recovered, as well as manufactured within 500 miles of the project site.
 - a. Include a statement indicating the percentage by weight which is extracted, harvested, or recovered within 500 miles of the project site.
- 3. LEED Sustainable Sites Credit 7.1, Non-roof: Submit letter from manufacturer certifying the solar reflectance index (SRI) of the paver is 29 or greater.

1.04 QUALITY ASSURANCE

- A. Utilize a Manufacturer having at least ten years of experience manufacturing interlocking concrete pavers on projects of similar nature or project size.
- B. Source Limitations:
 - 1. Obtain Permeable Concrete Pavers from one source location with the resources to provide products of consistent quality in appearance and physical properties.
 - 2. Obtain Permeable Joint Opening Aggregate from one source with the resources to provide materials and products of consistent quality in appearance and physical properties.
- C. Paving Contractor Qualifications:
 - 1. Utilize an installer having successfully completed concrete paver installation similar in design, material, and extent indicated on this project.
- D. Mockups:
 - 1. Install a 5 ft x 5 ft paver area.
 - 2. Use this area to determine joint sizes, lines, laying pattern(s) and levelness. This area will serve as the standard by which the workmanship will be judged.
 - 3. Subject to acceptance by owner, mock-up may be retained as part of finished work.
 - 4. If mock-up is not retained, haul offsite and dispose legally.

1.05 DELIVERY, STORAGE & HANDLING

- A. In accordance with Conditions of the Contract and Division 1 Product Requirement Section. (Modify this to match the general conditions of the specific project)
- B. Deliver Permeable Concrete Pavers in manufacturer's original, unopened and undamaged container packaging with identification labels intact.
 - 1. Coordinate delivery and paving schedule to minimize interference with normal use of streets and sidewalks adjacent to paver installation.
 - 2. Deliver concrete pavers to the site in steel banded, plastic banded or plastic wrapped packaging capable of transfer by forklift or clamp lift.
 - 3. Unload pavers at job site in such a manner that no damage occurs to the product or adjacent surfaces.
- C. Store and protect materials free from mud, dirt and other foreign materials.

1.06 PROJECT/SITE CONDITIONS

- A. Environmental Requirements:
 - 1. Install permeable pavers only on unfrozen permeable setting bed aggregate materials.
 - 2. Install permeable setting bed only on unfrozen permeable base and subbase aggregates.
 - 3. Install permeable base or subbase aggregates only over unfrozen subgrade.

1.07 PERMEABLE CONCRETE PAVER OVERAGE AND ATTIC STOCK

- A. Provide a minimum of 5% additional material for overage to be used during construction.
- B. Furnish 100 square feet of each product and size used to owner for maintenance and repair. Furnish Permeable Concrete Pavers from the same production run as installed materials.
- C. Manufacture to supply maintenance and reinstatement manuals for Permeable Concrete Paver units.

- 1.08 LEED REQUIREMENTS (required only for LEED projects, delete otherwise)
 A. Add any specific requirements necessary for achieving desired credits.

PART 2 PRODUCTS

2.01 PERMEABLE CONCRETE PAVERS

- A. Basis-of-Design Product: The permeable concrete paver shapes are based on:
1. Unilock: (Select product or products being used)
 - a. Eco-Optiloc
 - b. Eco-Priora
 - c. Eco-Promenade
 - d. Eco-Line
 - e. DuraFlow
 - f. Town Hall
 - g. (other Unilock products)
 2. As manufactured by:
 Unilock (Add location)
 Address
 City, State and Zip
 Contact: (insert Unilock representative name and phone number) or your local Territory Manager
 3. The specified products establish minimum requirements that substitutions must meet to be considered acceptable.
 - a. To obtain acceptance of unspecified products, submit written requests at least 7 days before the Bid Date.
- Note: Unless required by the owner, an "or equal" line is not necessary when using a basis-of-design specification with the above information is listed and outline in Division 1, Product Substitution Procedures.
- Or choose number 3 below and delete above number 3.
3. Substitutions: No substitutions permitted.
- B. Product requirements:
1. Permeable Paver Type 1: Unilock Eco-Optiloc (or other Unilock product name)
 - a. Finish: (Select finish type from below and insert here. Finish type will affect product pricing).
 1. Standard – this is not a face mix finish.
 2. Smooth (Premier) – this is a face mix finish.
 3. Brushed (IL Campo) – this is a face mix finish.
 4. Exposed Granite (Series 3000) – this is a face mix finish.
 5. Granite appearance (Umbriano) – this is a face mix finish.
 6. Tile appearance (Senzo) – this is a face mix finish.
 7. Add other Unilock options.
 - b. Color: Insert product color
 - c. Edge: Chamfer - 3 mm bevel
 - d. Size: Manufacture the sizes indicated with a maximum tolerance of plus or minus 1/16 inch for length and width. Maximum height tolerance of plus or minus 1/8 inch.
 1. L-shape

Note: Imperial dimensions are nominal equivalents to the metric dimensions.
 2. Permeable Paver Type 2: Unilock Eco-Priora (or other Unilock product name)
 - a. Finish: (Select finish type from below and insert here. Finish type will affect product pricing).
 1. Standard – this is not a face mix finish.
 2. Smooth (Premier) – this is a face mix finish.
 3. Brushed (IL Campo) – this is a face mix finish.

4. Exposed Granite (Series 3000) – this is a face mix finish.
5. Granite appearance (Umbriano) – this is a face mix finish.
6. Tile appearance (Senzo) – this is a face mix finish.
7. Add other Unilock options.
- b. Color: Insert product color
- c. Edge: Chamfer - 3 mm rolled
- d. Size: Manufacture the sizes indicated with a maximum tolerance of plus or minus 1/16 inch for length and width. Maximum height tolerance of plus or minus 1/8 inch.
 1. 120 mm (5 in) x 120 mm (5 in) x 80 mm (3-1/8 in) thick
 2. 120 mm (5 in) x 240 mm (10 in) x 80 mm (3-1/8 in) thick
 3. 240 mm (10 in) x 240 mm (10 in) x 80 mm (3-1/8 in) thick

Note: Imperial dimensions are nominal equivalents to the metric dimensions.
3. Permeable Paver Type 3: Town Hall (or other Unilock product name)
 - a. Finish: molded Streetpaver
 - b. Color: Insert product color(s): Burgundy Red, Burnt Clay, Old Oak
 - c. Edge: molded
 - d. Size: Manufacture the sizes indicated with a maximum tolerance of plus or minus 1/16 inch for length and width. Maximum height tolerance of plus or minus 1/8 inch..
 1. 10 cm (4 in) x 25 cm (9-3/4 in) x 7 cm (2-3/4 in) thick
4. (Insert additional Permeable Paver Types here as necessary or delete this line)
- C. Provide pavers meeting the minimum material and physical properties set forth in ASTM C 936, Standard Specification for Interlocking Concrete Paving Units. Efflorescence is not a cause for rejection.
 1. Average compressive strength 8000 psi (55MPa) with no individual unit under 7,200 psi (50 MPa).
 2. Average absorption of 5% with no unit greater than 7% when tested according to ASTM C 140.
 3. Conforming to ASTM C 1645 when tested for freeze-thaw requirements.
 4. Height tolerances +/- 3.2 mm (1/8 in).

Note: Efflorescence is a whitish powder-like deposit that sometimes appears on concrete products. Calcium hydroxide and other water-soluble materials form or are present during the hydration of Portland cement. Pore water becomes saturated with these materials, and diffuses to the surface of the concrete. When this water evaporates, the soluble materials remain as a whitish deposit on the concrete surface. The calcium hydroxide is converted to calcium carbonate during a reaction with carbon dioxide from the atmosphere. The calcium carbonate is difficult to remove with water. However, the efflorescence will wear off with time, and it is advisable to wait a few months before attempting to remove any efflorescence. Commercially available cleaners can be used, provided directions are carefully followed. Some cleaners contain acids that may alter the color of the pavers.
- D. Accept only pigments in concrete pavers conforming to ASTM C 979.
Note: ACI Report No. 212.3R provides guidance on the use of pigments.
- E. Maximum allowable breakage of product is 5%.

2.02 PERMEABLE JOINT OPENING AGGREGATE

- A. Provide Permeable Joint Opening Aggregate materials conforming to ASTM C 33 and gradation requirements of ASTM D 448 No. 8 as shown in Table 1. Unilock recommends using granite chips listed in table 2 below for vehicular areas with heavy traffic loads such as roadways or drive-through areas.

**TABLE 1 - ECO-OPTILOC
PERMEABLE JOINT OPENING AGGREGATE
GRADATION REQUIREMENTS
(CRUSHED LIMESTONE)**

ASTM No. 8	
Sieve Size	Percent Passing
1/2 in (12.5 mm)	100
3/8 in (9.5 mm)	85 to 100
No. 4 (4.75 mm)	10 to 30
No. 8 (2.36 mm)	0 to 10
No. 16 (1.18 mm)	0 to 5

- B. Provide Permeable Joint Opening Aggregate materials conforming to ASTM C 33 and gradation requirements as presented in Table 2.

1. Supplier:
 - a. [Kafka Granite LLC, 101 S. Weber Ave, Stratford, WI 54484 – Toll Free: 800-852-7415](#)
 - b. [Alliance Aqua-Roc](#)
 - c. [SEK Perm Chip](#)
2. Color: [\(Specify granite chip color if other than crushed limestone\)](#)

**TABLE 2 - ECO-PRIORA & TOWN HALL
PERMEABLE JOINT OPENING AGGREGATE
GRADATION REQUIREMENTS
(GRANITE CHIPS)**

1/8 to 3/16 inch granite chips	
Sieve Size	Percent Passing
1/4 in (6 mm)	97 to 100
No. 4 (4.75 mm)	70 to 83
No. 8 (2.36 mm)	37 to 50
No. 16 (1.18 mm)	0 to 12
pan	

2.03 PERMEABLE SETTING BED AGGREGATE

- A. Provide Permeable Setting Bed Aggregate materials conforming to ASTM C 33 and gradation requirements of ASTM D 448 No. 8 as presented in Table 3.

**TABLE 3
PERMEABLE SETTING BED AGGREGATE
GRADATION REQUIREMENTS**

ASTM No. 8	
Sieve Size	Percent Passing
½ in (12.5 mm)	100
3/8 in (9.5 mm)	85 to 100
No. 4 (4.75 mm)	10 to 30
No. 8 (2.36 mm)	0 to 10
No. 16 (1.18 mm)	0 to 5

2.04 PERMEABLE BASE AGGREGATE

- A. Provide Permeable Base Aggregate materials conforming to ASTM C 33 and gradation requirements of ASTM D 448 No. 57 as presented in Table 4.

TABLE 4
PERMEABLE BASE AGGREGATE
GRADATION REQUIREMENTS

ASTM No. 57	
Sieve Size	Percent Passing
1-1/2 in (37.5 mm)	100
1 in (25 mm)	95 to 100
1/2 in (12.5 mm)	25 to 60
No. 4 (4.75 mm)	0 to 10
No. 8 (2.36 mm)	0 to 5

2.05 PERMEABLE SUBBASE AGGREGATE

- A. Provide Permeable Subbase Aggregate materials conforming to ASTM C 33 and gradation requirements of ASTM D 448 No. 2 as presented in Table 5.

TABLE 5
PERMEABLE SUBBASE AGGREGATE
GRADATION REQUIREMENTS

ASTM No. 2	
Sieve Size	Percent Passing
3 in (75 mm)	100
2-1/2 in (63 mm)	90 to 100
2 in (50 mm)	35 to 70
1-1/2 in (37.5 mm)	0 to 15
3/4 (19 mm)	0 to 5

Note: For all aggregates, provide washed, clean, have zero plasticity, free from deleterious or foreign matter, crushed, angular rock and contain no No. 200 sieve size aggregate materials used in the construction of permeable pavement. Aggregate materials serve as the structural load bearing platform of the pavement as well as a temporary receptor for the infiltrated water that is collected through the openings in the pavement's surface.

2.06 GEOTEXTILE (Optional depending on soil conditions)

- A. Provide Geotextile material conforming to the following performance characteristics, measured per the test methods referenced:
- 4 oz., nonwoven needle punched geotextile composed of 100% polypropylene staple fibers that are inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.
 - Grab Tensile Strength: ASTM D 4632: 115 lbs.
 - Grab Tensile Elongation: ASTM D 4632: 50%
 - Trapezoidal Tear: ASTM D 4533: 50 lbs.
 - Puncture: ASTM D 4833: 65 lbs.
 - Apparent Opening Size: ASTM D 4751: 0.212 mm, 70 U.S. Sieve
 - Permittivity: ASTM D 4491: 2.0 sec⁻¹
 - Flow Rate: ASTM D 4491: 140 gal/min/s.f.
- B. As supplied by Unilock (add location, address, City, State and Zip)
Contact: (Insert Unilock representative name and phone number) or your local Territory Manager
- Carthage Mills – FX-40HS

2. U.S. Fabrics – US 115NW
3. Mirafi – 140N

2.07 EDGE RESTRAINTS

- A. Concrete Edge Restraint as indicated.
- B. Plastic and Metal Edge Restraints:
 1. Permaloc, www.permaloc.com
 - a. Material Type: Aluminum
 - b. Model No.: 3 inch GeoEdge capture plate and geogrid
 2. SEK Surebond
 - a. Model No.: 8 feet PermEdge with attached geogrid

Note: The provision of suitable edge restraints is critical to the satisfactory performance of interlocking concrete block pavement. Abut pavers tightly against the restraints to prevent rotation under load and any consequent spreading of joints. Install sufficiently stable edge restraints that are, in addition to providing suitable edge support for the paver units, able to withstand the impact of temperature changes, vehicular traffic and/or snow removal equipment.

Curbs, gutters or curbed gutter, constructed to the dimensions of municipal standards (noting that these standards generally refer to cast-in-place concrete sections), are considered to be acceptable edge restraints for heavy duty installations. Where extremely heavy industrial equipment is involved such as container handling equipment, review the flexural strength of the edge restraint carefully particularly if a section that is flush with the surface is used and may be subjected to high point loading.

2.08 ACCESSORIES (Optional depending on project needs)

- A. [Cleaners] [Sealers]
 1. Supplier: Unilock (add location, address, City, State and Zip)
Contact: (Insert Unilock representative name and phone number) or your local Territory Manager
 2. Material Type and Description: (Specify material type and description)
 3. Material Standard: (Specify material standard)

Note: Generally sealing permeable pavers for utilitarian uses such as parking lots is not necessary. Consult with your product representative prior to specifying or remove section 2.08 Accessories.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas indicated to receive paving for compliance with requirements for installation tolerances and other conditions affecting performance for the following items before placing the Permeable Concrete Pavers.
 1. Verify that subgrade preparation, compacted density and elevations conform to specified requirements.
 2. Verify that Geotextiles, if applicable, have been placed according to drawings and specifications.
 3. Verify that Permeable Base and Subbase Aggregate materials, thickness, compacted density, surface tolerances and elevations conform to specified requirements.
 4. Provide written density test results for soil subgrade, Permeable Base and Subbase Aggregate materials to the Owner, General Contractor and paver installation subcontractor.
 5. Verify location, type, and elevations of edge restraints, concrete collars around utility structures, and drainage inlets.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Beginning of bedding sand and paver installation signifies acceptance of base and edge restraints.

3.02 PREPARATION

- A. Verify that the subgrade soil is free from standing water.
- B. Stockpile Permeable Setting Bed, Joint, Base and Subbase Aggregate materials such that they are free from standing water, uniformly graded, free of any organic material or sediment, debris, and ready for placement.
- C. Remove any excess thickness of soil applied over the excavated soil subgrade to trap sediment from adjacent construction activities before placing the Geotextile and Permeable Subbase Aggregate materials.
- D. Keep area where pavement is to be constructed free from sediment during entire job. Remove and replace all Geotextile, Permeable Joint, Setting Bed, Base and Subbase Aggregate materials contaminated with sediment with clean materials.
- E. Complete all subdrainage of underground services within the pavement area in conjunction with subgrade preparation and before the commencement of Permeable Subbase Aggregate construction.
- F. Prevent damage to underdrain pipes, overflow pipes, observation wells, or inlets and other drainage appurtenances during installation. Report all damage immediately.
- G. Compact soil subgrade uniformly to at least 90 percent of Standard Proctor Density per ASTM D 698 for pedestrian areas. Compact soil subgrade uniformly to at least 95 percent Modified Proctor per ASTM D 1557 for vehicular areas.
- H. Proof-roll prepared subgrade according to requirements in Division 31 Section "Earth Moving" to identify soft pockets and areas of excess yielding. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting and replace with compacted backfill or fill as directed.

Note: Base compaction and proof-rolling of the subgrade soil on the recommendations of the Design Engineer. Request the Architect/Engineer to inspect subgrade preparations, elevations and conduct density tests for conformance to specifications.

Note: Mechanical tampers (jumping jacks) are recommended for compaction of soil subgrade and aggregate base around lamp standards, utility structures, building edges, curbs, tree wells and other protrusions. Compact areas, not accessible to roller compaction equipment, to the specified density with mechanical tampers. **CAUTION** – Proceed with care around the perimeters of excavations, buildings, curbs, etc. These areas are especially prone to consolidation and settlement. Do not place wedges of backfill in these areas. If possible particularly in these areas, proceed with backfilling and compacting in shallow lifts, parallel to the finished surface.

3.03 INSTALLATION

A. EDGE RESTRAINTS

- 1. Provide edge restraints as indicated.
 - a. Install job-built concrete edge restraints to comply with requirements in Division 3 Section "Cast-in-Place Concrete." (Add section number and match specification name)
 - b. Provide concrete edge restraint along the perimeter of all paving as specified. Install the face of the concrete edge restraint, where it abuts pavers vertical down to the subbase.
 - c. Construct concrete edge restraint to dimensions and level specified and support on a compacted subbase not less than 6 in (150 mm) thick.
- 2. Provide plastic or metal edge restraints as indicated. (Delete if not being used).
 - a. Provide plastic or metal edge restraints along the perimeter of all paving as indicated and supported on a minimum of 6 inches (150 mm) of Base Aggregate.

- b. Provide 10" spiral galvanized or stainless steel spike to fasten plastic edge restraint at 24 inches on center for straight sections and 12 inches on center for curved sections.
- B. GEOTEXTILES (Delete if not being used).
 1. Provide separation geotextile on bottom and sides of prepared soil subgrade. Secure in place to prevent wrinkling or folding from equipment tires and tracks.
 2. Overlap ends and edges a minimum of 18 in. (450 mm) in the direction of drainage.
- C. PERMEABLE BASE AND SUBBASE AGGREGATE
 1. Provide the Permeable Subbase Aggregate in uniform lifts not exceeding 6 in., (150 mm) loose thickness and compact to at least 95 percent as per ASTM D 4254 to depths as indicated.
 2. Compact the Permeable Subbase Aggregate material with at least two passes in the vibratory mode then at least two in the static mode with a minimum 10 ton vibratory roller until there is no visible movement. Do not crush aggregate with the roller.
 3. Tolerance: Do not exceed the specified surface grade of the compacted Permeable Subbase Aggregate material more than $\pm 3/4$ in. (20 mm) over a 10 ft. (3 m) long straightedge laid in any direction.
 4. Provide the Permeable Base Aggregate material in uniform lifts not exceeding 6 in. (150 mm) over the compacted Permeable Subbase Aggregate material and compact to at least 95 percent as per ASTM D 4254 to depths as indicated.
 5. Compact the Permeable Base Aggregate material with at least two passes in the vibratory mode then at least two in the static mode with a minimum 10 ton vibratory roller until there is no visible movement. Do not crush aggregate with the compaction device.
 6. Tolerance: Do not exceed the specified surface grade of the compacted Permeable Base Aggregate material more than $\pm 1/2$ in. (13 mm) over a 10 ft. (3 m) long straightedge laid in any direction.
 7. Grade and compact the upper surface of the Permeable Base Aggregate material sufficiently to prevent infiltration of the Permeable Setting Bed Aggregate material both during construction and throughout its service life.

Note: In-place density of the Permeable Base and Subbase Aggregate materials may be checked per ASTM D 4254. Establish a Compacted density of 95% of the laboratory index density for the subbase and base stone.
- D. PERMEABLE SETTING BED AGGREGATE
 1. Provide, spread and screed Permeable Setting Bed aggregate evenly over the Permeable Base Aggregate course.
 - a. Protect screeded Permeable Setting Bed Aggregate from being disturbed.
 - b. Screed only the area which can be covered by pavers in one day.
 - c. Do not use Permeable Setting Bed Aggregate material to fill depressions in the base surface.
 2. Keep moisture content constant and density loose and constant until Concrete Pavers are set and compacted.
 3. Inspect the Permeable Setting Bed Aggregate course prior to commencing the placement of the permeable concrete pavers.
 4. Inspect the Setting Bed Aggregate course prior to commencing the placement of the Permeable Concrete Pavers. Acceptance of the Setting Bed Aggregate occurs with the initiation of Permeable Concrete Paver placement.
- E. PERMEABLE CONCRETE PAVERS
 1. Replace unit pavers with chips, cracks, voids, discolorations, and other defects that might be visible in finished work.
 2. Mix Concrete Pavers from a minimum of three (3) bundles simultaneously drawing the paver vertically rather than horizontally, as they are placed, to produce uniform blend of colors and textures. (Color variation occurs with all concrete products. This phenomenon is influenced by a variety of factors, e.g. moisture content, curing conditions, different aggregates and, most commonly, from different production

runs. By installing from a minimum of three (3) bundles simultaneously, variation in color is dispersed and blended throughout the project).

3. Exercise care in handling face mix pavers to prevent surfaces from contacting backs or edges of other units.
4. Provide Permeable Concrete Pavers using joint pattern as indicated. Adjust joint pattern at pavement edges such that cutting of edge pavers is minimized. Cut all pavers exposed to vehicular tires no smaller than one-third of a whole paver.
5. Use string lines or chalk lines on Permeable Setting Bed aggregate to hold all pattern lines true.
6. Set surface elevation of pavers 1/8 in. (3 mm) above adjacent drainage inlets, concrete collars or channels.
7. Place units hand tight against spacer bars. Adjust horizontal placement of laid pavers to align straight.
 - a. When installation is performed with mechanical equipment, use only unit pavers with spacer bars on sides of each unit.
8. Provide space between paver units of 1/32 in. (1 mm) wide to achieve straight bond lines.
9. Prevent joint (bond) lines from shifting more than $\pm 1/2$ in. (± 15 mm) over 50 ft. (15 m) from string lines.
10. Fill gaps between units or at edges of the paved area that exceed 3/8 inch (10 mm) with pieces cut to fit from full-size unit pavers.
11. Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.
12. Prevent all traffic on installed pavers until Permeable Joint Aggregate has been vibrated into joints. Keep skid steer and forklift equipment off newly laid pavers that have not received initial compaction and Permeable Joint Aggregate material.
13. Vibrate pavers into leveling course with a low-amplitude plate vibrator capable of a to 5000-lbf (22-kN) compaction force at 80 to 90 Hz. Perform at least three passes across paving with vibrator. Vibrate under the following conditions:
 - a. After edge pavers are installed and there is a completed surface.
 - b. Compact installed concrete pavers to within 6 feet (1,800 mm) of the laying face before ending each day's work. Cover pavers that have not been compacted and leveling course on which pavers have not been placed, with nonstaining plastic sheets to prevent Permeable Setting Bed Aggregate from becoming disturbed.
14. Protect face mix Concrete Paver surface from scuffing during compaction by utilizing a urethane pad.
15. Remove any cracked or structurally damaged pavers and replace with new units prior to installing Permeable Joint Opening Aggregate material.
16. Provide, spread and sweep Permeable Joint Opening Aggregate into joints immediately after vibrating pavers into Permeable Setting Bed course until full. Vibrate pavers and add Permeable Joint Aggregate material until joints are completely filled, then remove excess material. This will require at least 4 passes with a plate compactor.
17. Remove excess Permeable Joint Aggregate broom clean from surface when installation is complete.

3.04 FIELD QUALITY CONTROL

- A. Verify final elevations for conformance to the drawings after sweeping the surface clean.
 1. Prevent final Concrete Paver finished grade elevations from deviating more than $\pm 3/8$ in. (± 10 mm) under a 10 ft (3 m) straightedge or indicated slope, for finished surface of paving.
- B. [Lippage: Paver-to-Paver Lippage:](#)
 1. [No greater than 3 mm \(1/8 inch\) difference in height between adjacent pavers.](#)

Note: The industry standard acceptable lippage between adjacent pavers is 3 mm (1/8 inch). Achieving a completely flush paver surface is most desirable but may be unattainable depending on factors such as paver type, setting bed materials or depth, ASTM manufacturing standards or other specific project needs. Consult with your Unilock representative to determine the best approach for a reasonable lippage tolerance on each project.

3.05 REPAIRING, CLEANING AND SEALING

- A. Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.
- B. Cleaning: Remove excess dirt, debris, stains, grit, etc. from exposed paver surfaces; wash and scrub clean.
 - 1. Clean Permeable Concrete Pavers in accordance with the manufacturer's written recommendations.
- C. Seal as indicated. (If not indicated elsewhere in the contract documents, sealing is not required and remove this section 3.05, C.)
 - 1. Apply Sealer for Permeable Concrete Pavers in accordance with the sealer and paver manufacturer's written recommendations.

3.06 PROTECTION

- A. Protect completed work from damage due to subsequent construction activity on the site.

3.07 PERMEABLE JOINT AGGREGATE MATERIAL REFILLING

- A. Remove all debris from joint and provide additional Permeable Joint Aggregate material after 120 days and before 150 days after date of Substantial Completion/Provisional Acceptance.
 - 1. Fill Permeable Joint Aggregate material full to the lip of the paver.

NOTE: This preventative maintenance requirement is very important to include in your specification to help increase the long term function of the system. This is a good item to mention during the prebid meeting.

4.08 LIFE CYCLE ACTIVITIES

- A. Paver cleaning: Clean Permeable Concrete Pavers as needed to remove staining, dirt, debris, etc.
 - 1. Clean per manufacturers recommendations.
- B. Maintenance: Permeable Joint Aggregate Material.
 - 1. Annually inspect Permeable Joint Aggregate material for areas clogged with debris.
 - 2. Vacuum or sweep as necessary to restore surface infiltration.
 - 3. Remove debris by vacuuming or sweeping Permeable Joint Aggregate
 - a. Replenish removed Permeable Joint Aggregate material with clean aggregate material flush to paver lip.
 - b. Sweep excess material from paver surface.

END OF SECTION