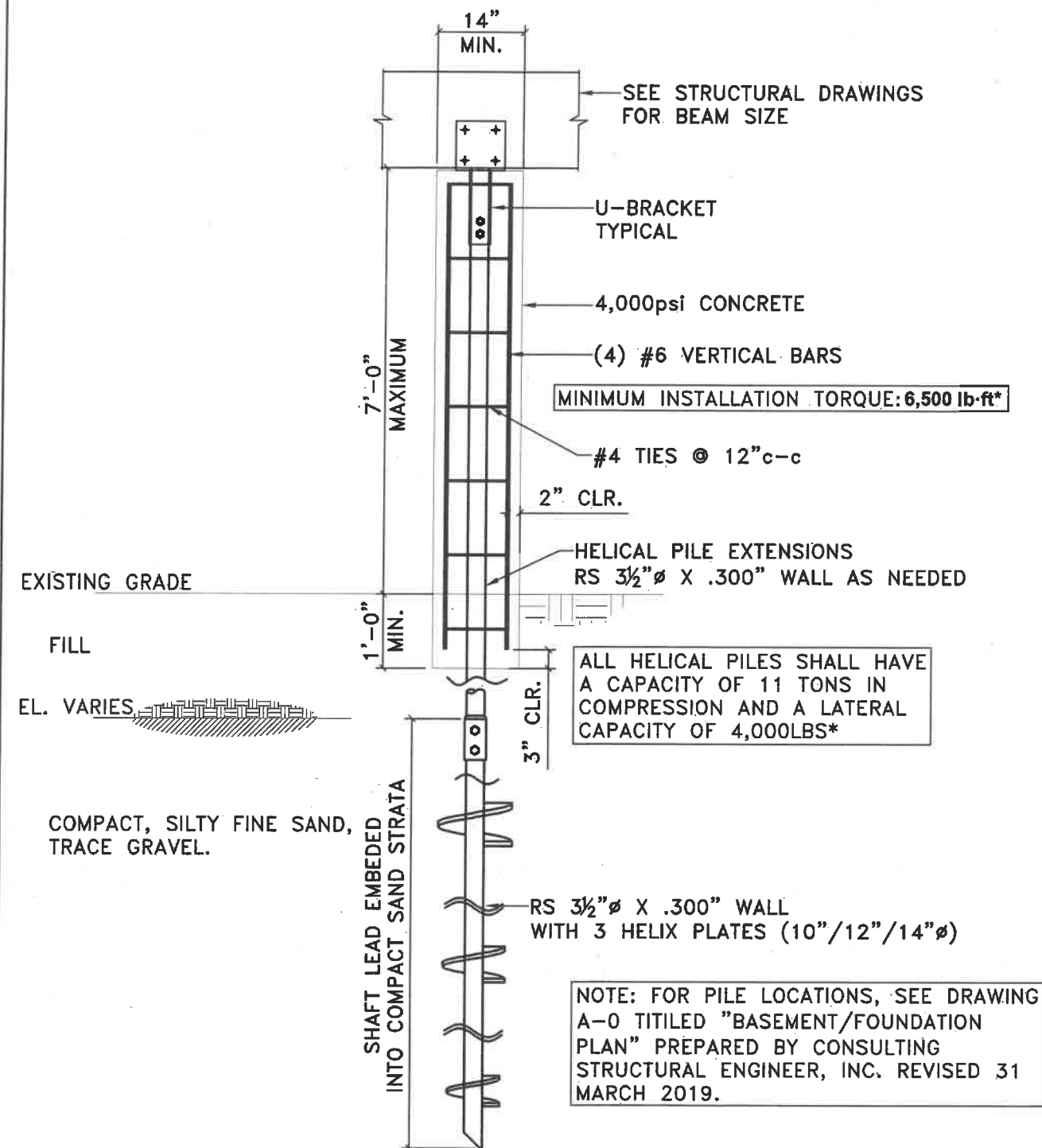




TYPICAL HELICAL PILE SECTION
NOT TO SCALE

GENERAL NOTES

SUBSURFACE INFORMATION USED TO PREPARE THIS DESIGN INCLUDE THREE BORING LOGS PREPARED BY CARR-DEE CORP. DATED 24 MARCH 2023.

VERIFY LOCATIONS OF ALL UTILITIES PRIOR TO COMMENCING HELICAL PILE INSTALLATION. SHOULD UTILITIES INTERFERE WITH THE CONSTRUCTION OF ANY WORK SHOWN ON THIS DRAWING, NOTIFY THE DESIGN ENGINEER IMMEDIATELY SO THAT MODIFICATIONS TO THE WORK CAN BE MADE.

SOIL CONDITIONS AND PARAMETERS USED IN THE DESIGN WERE SELECTED BASED ON DESCRIPTIONS AND SPT N-VALUES GIVEN IN THE AVAILABLE PROJECT BORING LOGS. IF FIELD CONDITIONS VARY FROM THOSE ASSUMED, NOTIFY DESIGN ENGINEER IMMEDIATELY.

IT IS INTENDED THAT ALL HELICAL PILES BEAR IN THE COMPACT SAND LAYER SHOWN ON THE BORING LOGS. THE TOP OF THIS STRATUM IS EXPECTED TO VARY BETWEEN ELEVATIONS 12± AND 25± FEET RELATIVE TO THE EXISTING GROUND SURFACE ELEVATIONS WHERE BORINGS WERE COMPLETED.

SLIGHT VARIATIONS FROM THOSE SHOWN ON THIS SCHEMATIC DESIGN DRAWING AMONG MANUFACTURERS OF HELICAL PILES. HELICAL PILE INSTALLATION SHALL BE PERFORMED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

INSTALL HELICAL PILES AT THE LOCATIONS SHOWN TO THE MINIMUM DEPTH AND TO THE MINIMUM TORQUE VALUE REQUIRED. MONITORING SHALL BE PERFORMED AS REQUIRED BY MASSACHUSETTS BUILDING CODE AND TORQUE INSTALLATION SHALL BE MONITORED THROUGHOUT THE INSTALLATION PROCESS.

*THE DESIGN LOADS TAKEN FROM LETTER TITLED "REVIEW OF HOUSE AND SITE PLAN" BY CONSULTING STRUCTURAL ENGINEER, INC. DATED 11 MARCH 2021. LOADS SHALL BE VERIFIED BY STRUCTURAL ENGINEER PRIOR TO INSTALLATION.

MATERIALS:

HELICAL PILES: 3 1/2" Ø x 0.300" SHAFT WITH 3 HELICES LEAD (10"/12"/14") MINIMUM AND APPROPRIATE PILE CAP BRACKET FOR NEW CONSTRUCTION.

ALL HELICAL PILES TO BE CORROSION PROTECTED BY HOT-DIP GALVANIZATION AFTER FABRICATION CONFORMING TO ASTM A153. ZINC USED SHALL CONFORM TO ASTM B6 AND SHALL BE AT LEAST EQUAL TO THE GRADE PRIME WESTERN (MINIMUM 98% ZINC). A MINIMUM OF 0.5% NICKEL (BY WEIGHT) SHALL BE ADDED TO THE GALVANIZING BATH.

ALL OTHER STEEL MEMBERS SHALL BE FABRICATED FROM STEEL MEETING THE REQUIREMENTS OF ASTM A36 GRADE 36 UNLESS NOTED OTHERWISE. MEMBERS SIZES OF EQUAL OR GREATER CAPACITY AS THOSE SHOWN MAY BE SUBSTITUTED.

PLACE CONCRETE BY APPROVED METHODS OF ACI304.

REINFORCING: PLACE REINFORCING USING STANDARD BAR SUPPORTS TO PROVIDE PROPER CLEARANCE AND PREVENT DISPLACEMENT DURING CONCRETE PLACEMENT AND OTHER OPERATIONS.

SPLICES, IF USED, SHALL BE CLASS B LAP SPLICES PER ACI-318 OR APPROVED MECHANICAL SPLICES WITH A CAPACITY OF AT LEAST 125% OF THE BAR STRENGTH.

MINIMUM CONCRETE COVER: CONCRETE PLACED AGAINST EARTH - 3 IN. FORMED CONCRETE PERMANENTLY EXPOSED TO EARTH - 1 1/2 IN. (2 IN. FOR #6 BARS OR LARGER).

FORMWORK: PROPERLY BRACE AND SHORE FORMWORK TO MAINTAIN ALIGNMENT AND TOLERANCES IN ACCORDANCE WITH ACI 347.

REINFORCING BARS SHALL BE PLACED IN ACCORDANCE WITH THE LATEST EDITION OF THE CRSI "RECOMMENDED PRACTICE FOR PLACING REINFORCING BARS".



Geotechnical Consultants, Inc.
201 Boston Post Road West
Marlborough, MA 01752
(508)229-0900 FAX (508)229-2279



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EXPONENTIAL CONSTRUCTION CORP
47 MELLE STREET
FRAMINGHAM, MASSACHUSETTS

HELICAL PILE DESIGN
1014 HIGHLAND STREET
HOLLISTON, MASSACHUSETTS

GCI # 2235331

Date
10 MAY 2023

Drawn By
JF

Scale
AS NOTED

Checked By
RP

1 OF 1

HP1

No.	Issue	Revision	Date
0	Issue		5-10-2023

Perc. Test ▽ Observed Groundwater

Test Date: September 21, 2015 @ 8:00 am

Weather: 58°-Sunny/Clear

Testing: Eric Dickinson - CIVILIZED SOLUTIONS

Witness: Scott Moles, ES - Holliston BOR Director

I CERTIFY THAT I AM A LICENSED ~~SOIL~~ EVALUATOR (SEE #13621), HAVING PASSED THE TRAINING AND TESTING REQUIREMENTS IN APRIL 2013.

Eric I. Dickinson
ERIC I. DICKINSON

Test Pit #1

EL. 98.4	Ap Topsoil
6" (97.9)	Bw Silt Loam 10YR5/6 Roots to 20"
20" (96.7)	Redox 5Y7/1
P-1C	C Sandy Loam 5Y6/3 Few cobbles, 10% Gravel, Friable, Standing water@125"
125" (87.9)	▽ Standing Water
132" (87.4)	

Class II

SCS Class Sandy Loam

Test Pit #2

EL. 97.1	Ap Topsoil
6" (96.6)	Bw Silt Loam 10YR5/6 Roots to 24"
24" (95.1)	Redox 5Y7/1
P-2C	C Sandy Loam 5Y6/3 Few cobbles, 10% Gravel, Friable, Standing water@129"
129" (86.4)	▽ Standing Water
132" (86.1)	

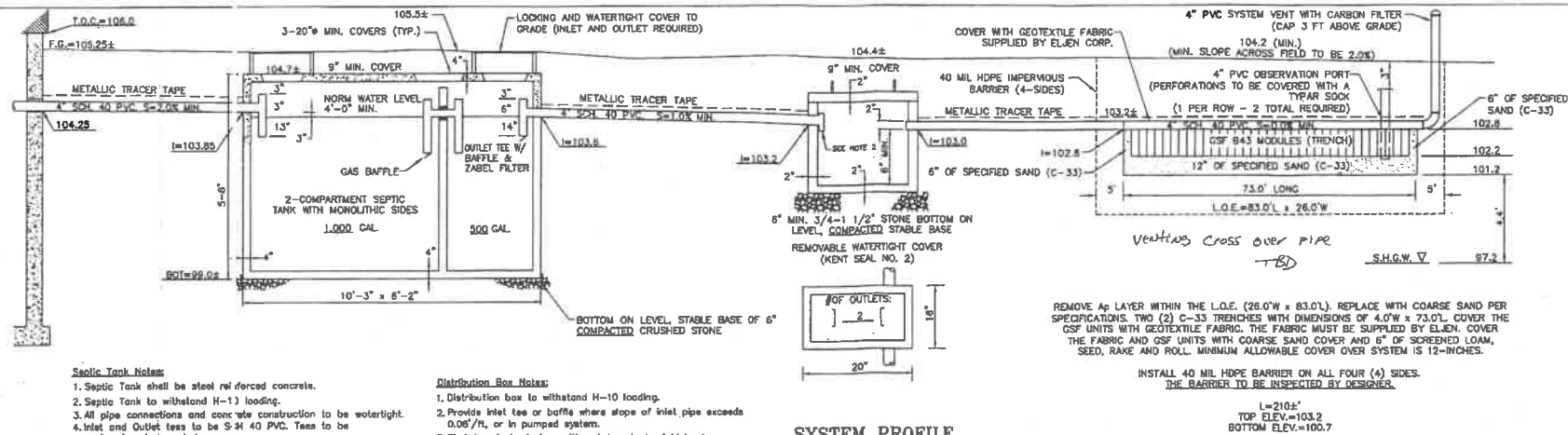
Class II

SCS Class Sandy Loam

Hole	P-1(C) (TP-1)	P-2(Bw) (TP-2)	P-2(C) (TP-2)
Depth (in.)	52"-64"	12"-24"	60"-72"
Time @ 12" 11"	8:55 am	10:00 am	10:18 am
10"	9:18 am		10:36 am
9"	9:32 am		11:06 am
8"	9:49 am	10:04 am	11:40 am
7"	10:07 am	10:07 am	1:16 pm
6"	10:29 am	10:08 am	2:02 pm
Times (9-6")	57 Min	3 Min	134 Min
Rate (Min/')	20 MPI	<2 MPI	45 MPI

1. This plan is for the construction of the sewage disposal facility ONLY.
2. All pipes shall be SCH 40 PTC or equivalent, unless otherwise noted.
3. Contractor shall call for inspections and approvals from the Board of Health and the Engineer after:
 - a.) excavation
 - b.) installation of system components
 - c.) backfilling and final grading
4. Engineer shall certify installation and final grades on "As-built" plan. Contractor shall certify that installation conforms to approved As-built: plan.
5. Prior to final backfill inspection, the contractor shall submit to B.O.H. a sketch with dimensions to system components from building corners and depth to access covers.
6. Contractor shall keep vehicles and materials off of the S.A.S. at all times.
7. No industrial wastes or categories are applicable.
8. Fill shall not be placed during rain or snow.
9. Excavation to be dry and scurfed. Dewatering is required if fill is to be placed below groundwater.
10. No existing or proposed wells are within 200' of S.A.S., except as shown.
11. There are no known public wells or surface water supplies within 400 feet; private wells within 200 feet; inland tanks or wetlands within 50 feet; no surface or subsurface drains of any kind except as shown, and no foundation drains. The work area inside the regulatory floodway and the 100-year floodplain.
12. Area is Nitrogen Sensitive.
13. All system components shall be marked with magnetic marking tape.

1. Within the limit of excavation, remove all topsoil (Ap) and other impervious material.
2. All construction materials and methods shall conform to D.E.P. Title 5 and the local Board of Health Regulations.
3. Contractor shall be responsible for locating any and all underground utilities within the limits of construction. This includes securing and paying for the services of the local utility and private companies to mark all underground utilities on the property. The Engineer does not guarantee that ALL utilities and subsurface structures are shown.
4. Sand shall be stockpiled at edge and pushed/cast inward over excavated area.
5. Contractor shall install and maintain flagging around the system until the Certificate of Compliance is issued.



Fill material shall be comprised of clean granular soil, free from organic matter and deleterious substances. Mixtures and layers of different classes of soils shall not be used. The fill shall not contain any material larger than two inches. A sieve analysis, using a #4 sieve, shall be performed on a representative sample of the fill delivered to the site, up to 40% by weight of the fill sample may be retained on the #4 sieve. Sieve analysis also shall be performed on the fraction of the fill sample passing the #6 sieve, such analysis must demonstrate that the material meets each of the following specifications:

sieve size	effective particle size	% that must pass sieve
4	4.75 mm	100% - 100%
50	0.30 mm	10% - 100%
100	0.15 mm	0% - 20%
200	0.075 mm	0% - 5%

3. Recommended manufacturer—Loma, or approved equivalent.

4. Recommended manufacturer—Loma, or approved equivalent.

NOT TO SCALE

S 31°20'51" E
253.56'

S 34°14'21" E
18.93'

50' BUFFER TO S.V.W.

40' REAR YARD SETBACK

50' SIDE YARD SETBACK

WETLANDS

LOT 8
1.39 ACRES

50' SIDE YARD SETBACK

50' BUFFER TO S.V.W.

20' DRAIN EASEMENT

BALCONY AREA ON HELICAL PIERS

PROPOSED 3-BEDROOM RESIDENCE
TOD=108.0
S AB=98.5
GARAGE=98.0

BIT. CONC. DRIVEWAY

INV=104.25

TEMP. SOIL STOCKPILE (LOAN ONLY)

INV=99.8
A12

GRADE TO DRAIN

4" SCH. 40 PVC
2-COMPARTMENT SEPTIC TANK WITH MONOLITHIC SIDES

4" PVC CLEANOUT (CAP TO GRADE)

4-FT MAX. BLOCK WALL (BY OTHERS)

4" OBSERVATION PORT

9-FT MAX. BLOCK WALL (BY OTHERS)

1:1 RAP-SLOPE

4" OBSERVATION PORT

4" SCH. 40 PVC
2-COMPARTMENT SEPTIC TANK WITH MONOLITHIC SIDES

3:1 GRASSED SLOPE

3:1 GRASSED SLOPE

BITUMINOUS SIDEWALK (PROTECT DURING CONSTRUCTION)

PROP. ELECTRIC, TELEPHONE AND CABLE (BY OTHERS)

CB RM=97.8

BM SPK SET IN POLE#91
ELEV.=100.00

CONSTRUCTION ACCESS (EXISTING CURB CUT)

PROP. WATER SERVICE (BY OTHERS)

ELVEN B43 MODULES TRENCH CONFIGURATION
(2 ROWS @ 18 UNITS PER ROW)

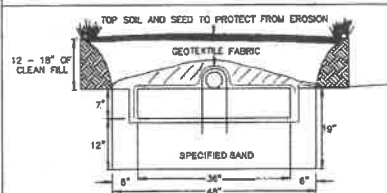
4" OBSERVATION PORT

CROSS OVER P.I.P.
T&D

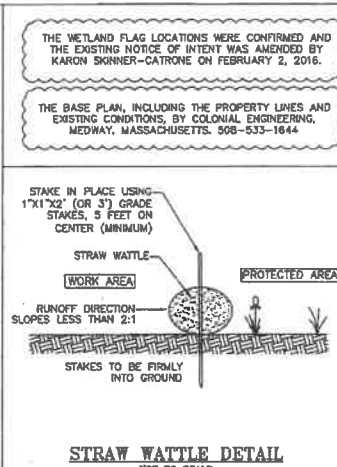
HIGHLAND STREET

(50' WIDE COUNTY LAYOUT)

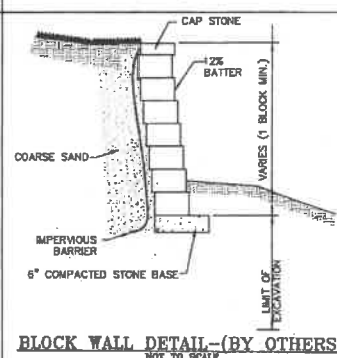
Sieve Size	Sieve Square opening size	Specification per cent passing (wet sieve)
3/8 inch	9.52 mm	100
No. 4	4.76 mm	85-100
No. 8	2.38 mm	60-100
No. 18	1.19 mm	40-85
No. 30	590 μ m	25-60
No. 50	297 μ m ²	10-30
No. 100	149 μ m	0-10
No. 200	75 μ m	0-5



TYPICAL ELJEN B43 TRENCH SECTION



STRAW WATTLE DETAIL



BLOCK WALL DETAIL--(BY OTHERS)
NOT TO SCALE

Prattice St

Holliston High School

Regier Hwy Rd

Leland Tree Rd

Spring Ln

Smithhurst Dr

Prospect St

Locust Tree Rd

Crevecoeur Dr

Highland St

Mollis St

LOCUS
1614 Highland St

	New Meets Existing (N.M.E.)
L.O.E.	Limit of Excavation
N.I.C.	Not In Contact
	Test Pit
(2)	Perc Hols
A — A	Section A-A
---98---	Existing Contour Elevation
---100---	Proposed Contour Elevation
	Groundwater
S.H.G.W	Seasonal High Groundwater

DESIGN FLOW: Single-Family Residence
3-Bedrooms Proposed
3 Bedrooms @ 110 GPD/Br = 330 GPD
SEPTIC TANK:
Required $330 \times 3 = 990$ Gal
Provided: 1,500 Gal
(Use a 2-Compartment Monolithic Tank)
GARBAGE GRINDER IS PROHIBITED
LEACHING FACILITY:
Design Per Cent 45 Min./Inch
Soil Class II
Loading Rate 0.20 Gal/Day/SF
Assume: Eljen GSF B45 Modules (Trench)
REQUIRED:
 330 GPD
 0.60 GPD/SF = 1,650 SF = 990 SF (PER ELJEN MANUAL)
(MIN. 36 UNITS REQ'D)
PROVIDED: TRENCH CONFIG--36 UNITS PROVIDED
2 ROWS OF 18 UNITS (7'8" LONG)
MIN. TRENCH REQUIRED:
(36 MODS $\times 4$ FT/UNIT) $\div 11$ SAND = 141 FT
PROVIDED: (36 MODS $\times 4$ FT/UNIT) $\div 11$ SAND = 145 FT
RESERVE AREA PROVIDED:
(36 MODS $\times 4$ FT/UNIT) $\div 11$ SAND = 145 FT

4" Foundation	<u>104.25</u>
4" Septic Tank (IN)	<u>103.85</u>
4" Septic Tank (OUT)	<u>103.6</u>
4" Distribution Box (IN)	<u>103.2</u>
4" Distribution Box (OUT)	<u>103.0</u>
4" Beg. Leaching Pipe	<u>102.8</u>
4" End Leaching Pipe	<u>102.8</u>
Elev. at Bottom of Eljen	<u>102.2</u>
Elev. at Bottom of C-33 Sand	<u>101.2</u>
Elev. at Bottom of Excavation	<u>6" BC</u>
Observed Groundwater Elev.	<u>87.9</u>
High Groundwater Elev.	<u>87.2</u>
Determination Method	<u>Soil Morphology</u>
B.O.H. Correction Factor	<u>N/A</u>

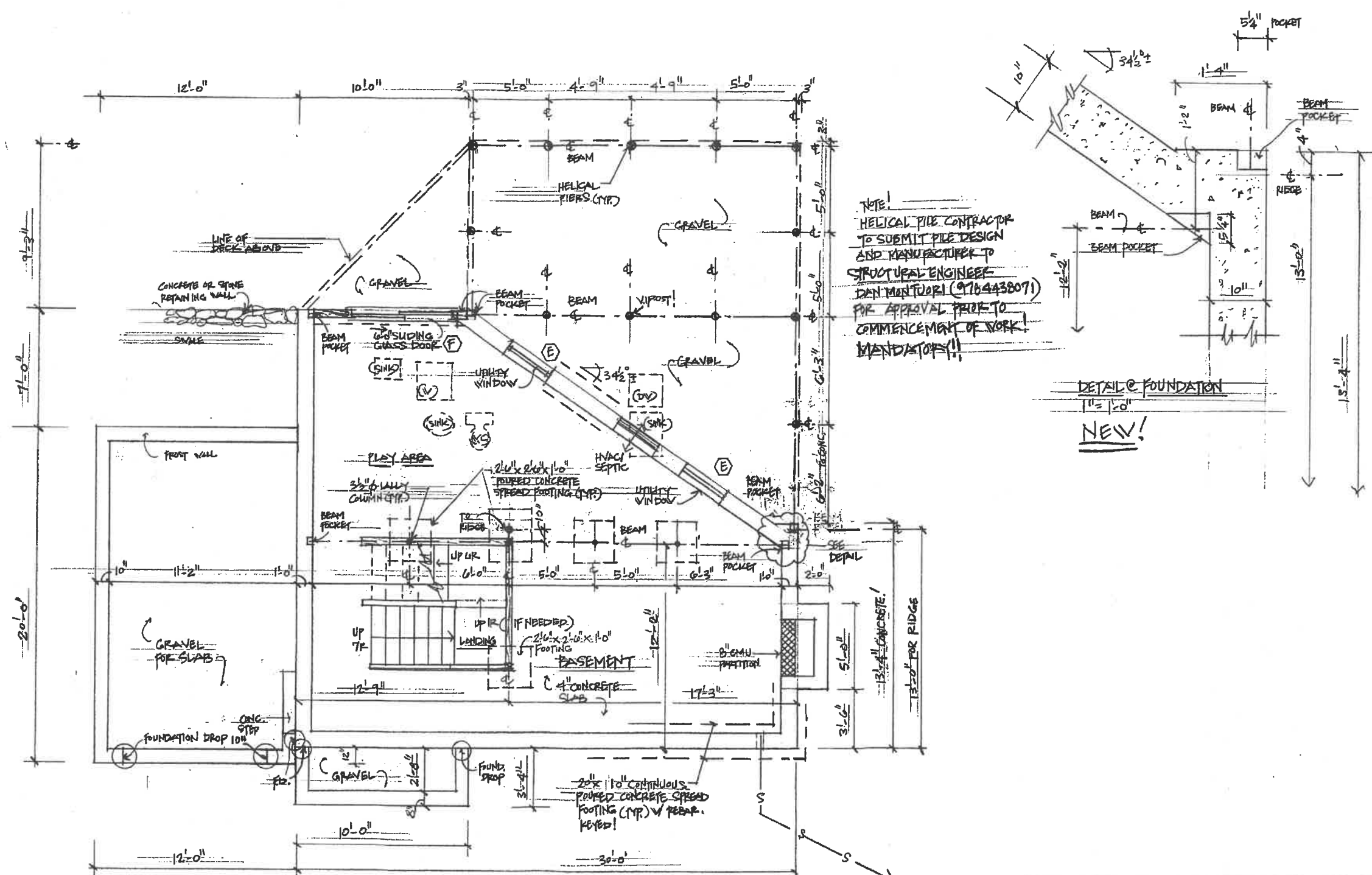
Approved with notes
Scott Wells 9-7-2023

1014 Highland Street Holliston, Massachusetts	
APPLICANT(S): Jose Aarao De Andrade 52 North Avenue Natick, MA 01740	ASSESSOR'S: MAP <u>8.E</u> BLOCK <u>1</u> LOT <u>8.0</u>

Revision History	2/3/18 ADDRESS OFF-SITE RUNOFF PER CONSERVATION COMMISSION
	3/6/18 REVISED LIMIT OF WORK/EROSION CONTROL BARRIER AND LEACHING FACILITY BREKING
	9/6/18 REVISED HOUSE TO INCLUDE BALCONY ON HELICAL PIERS
	9/19/18 ELIMINATE PUMP CHAMBER, ADD RETAINING WALLS
	9/19/18 ELIMINATE PUMP CHAMBER, ADD RETAINING WALLS
	8/29/23 NEW OWNER, STAMP EXPIRED PLAN

DESIGNED: E. Dickinson, RS	PREPARED BY:
CHECKED: ED	<i>CIVILized Solutions</i>
SCALE: 1"=20'	31 Smith Road Hopkinton, MA 01748 P: 508.306.1924
DATE: Dec. 9, 2015	





NOTE!
HELICAL PILE CONTRACTOR
TO SUBMIT PILE DESIGN
AND MANUFACTURE TO
STRUCTURAL ENGINEER
DANTE MONTUORI (9784438071)
FOR APPROVAL PRIOR TO
COMMENCEMENT OF WORK!
MANDATORY!!

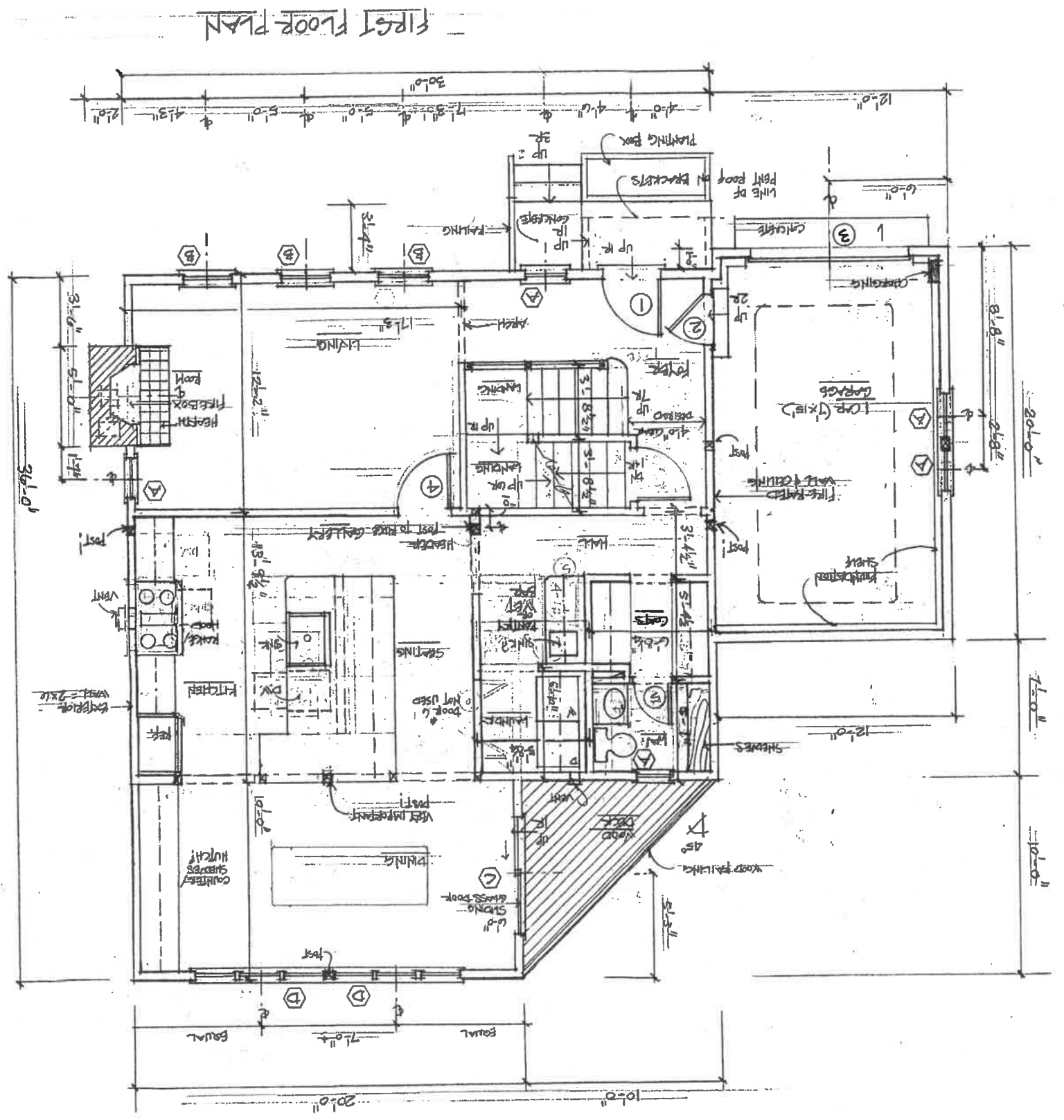
DETAIL C FOUNDATION
1" = 1'-0"
NEW!

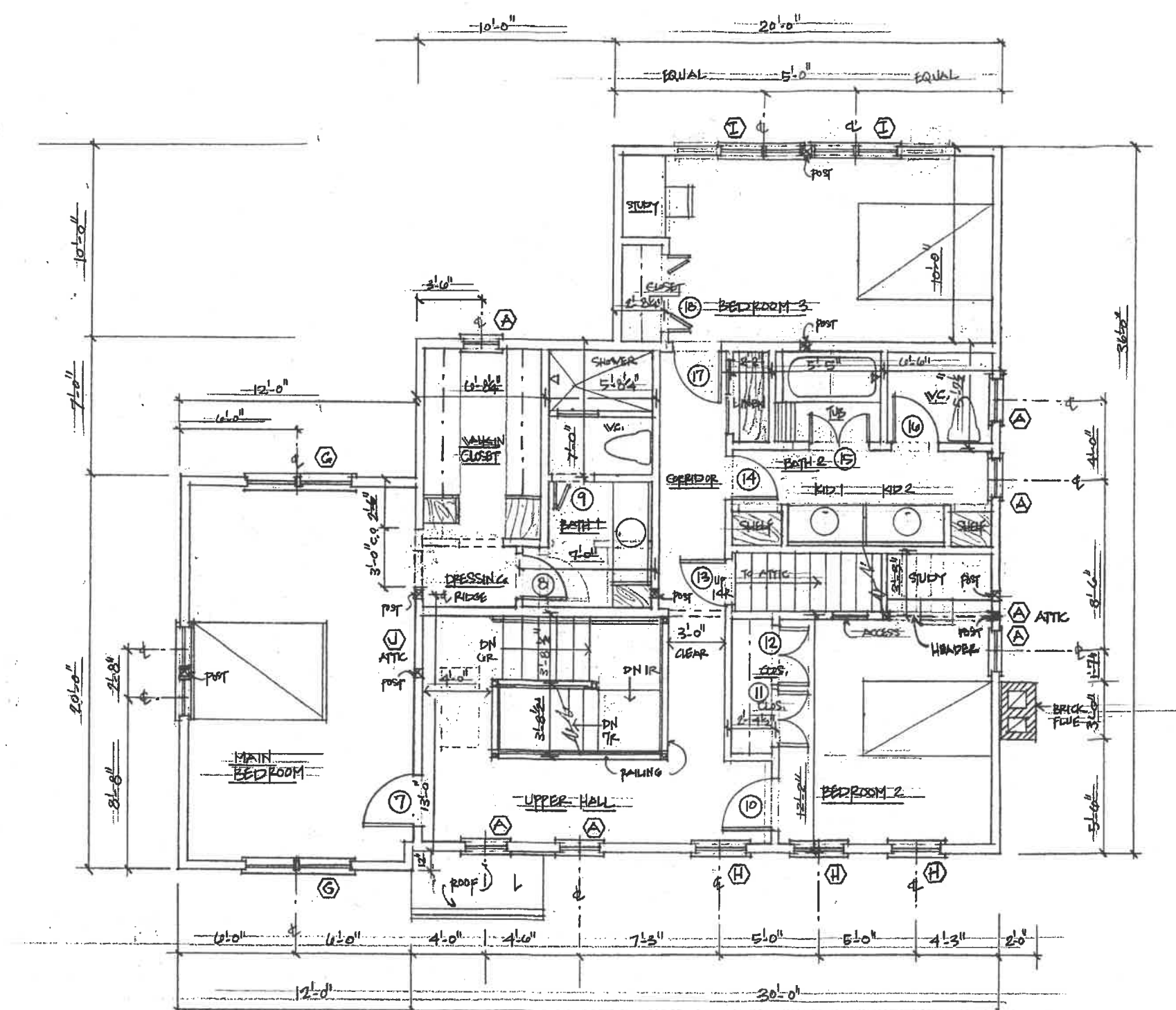
BASEMENT/FOUNDATION PLAN



NEW SINGLE FAMILY DWELLING		
SCALE: 1/4" = 1'-0"	APPROVED BY:	DRAWN BY: ACB
DATE: 16 MARCH 19		REVISED: 31 MARCH 19
1014 HIGHLAND ST, HOLLISTON, MASS.		
		DRAWING NUMBER A-0

DRAWING NUMBER		DATE: 6 MARCH 19	
NEW SINGLE FAMILY DWELLING		DRAWN BY: AOB	
104 HIGHLAND ST. HOLLISTON, MASS.		APPROVED BY:	
REVISIONS		SCALE: 1/8" = 1'-0"	



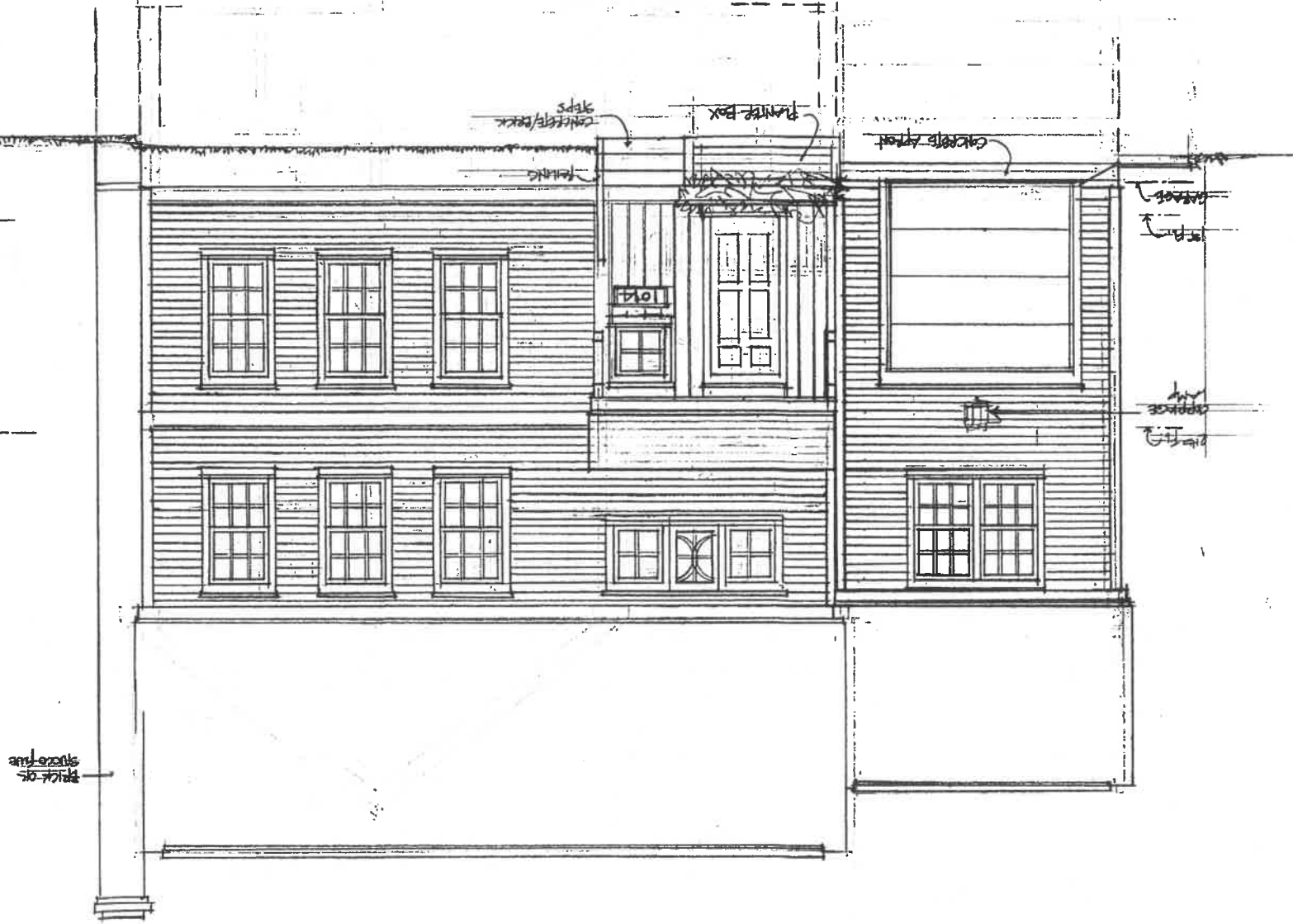


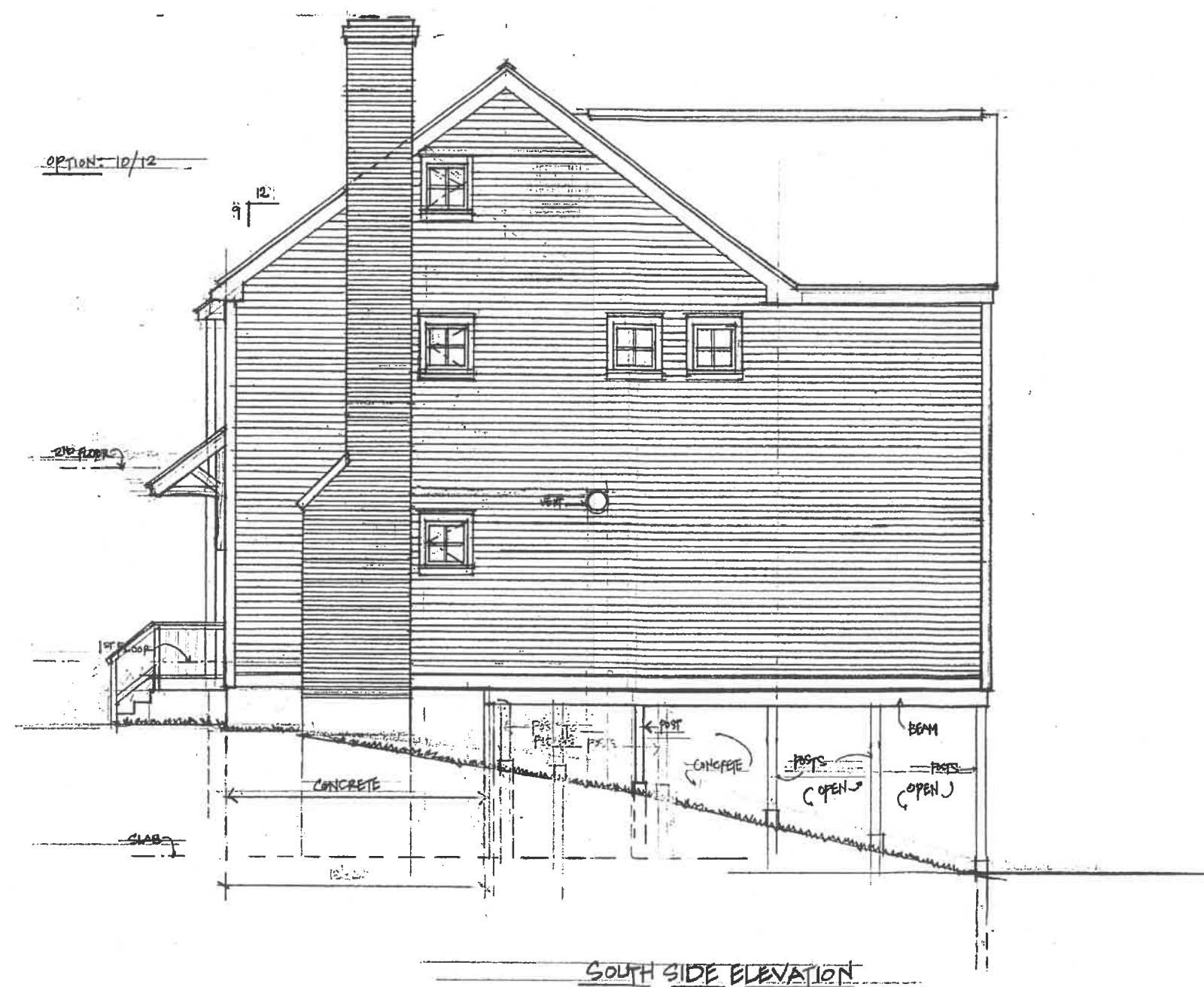
SECOND FLOOR PLAN

NEW SINGLE FAMILY DWELLING		
SCALE: 1/4" = 1'-0"	APPROVED BY:	DRAWN BY: ACB
DATE: 12 MARCH '19		REVISED 31 MARCH '19
1014 HIGHLAND ST., HOLLISTON, MASS.		
DRAWING NUMBER		A-2

DRAWING NUMBER		A-3	
1014 HIGHLAND ST. HOLLISTON, MASS.			
DATE: 6 MARCH 19		SCALE: 1/4" = 1'-0"	
DRAWN BY: A.C.B.		APPROVED BY:	
NEW SINGLE FAMILY DWELLING			

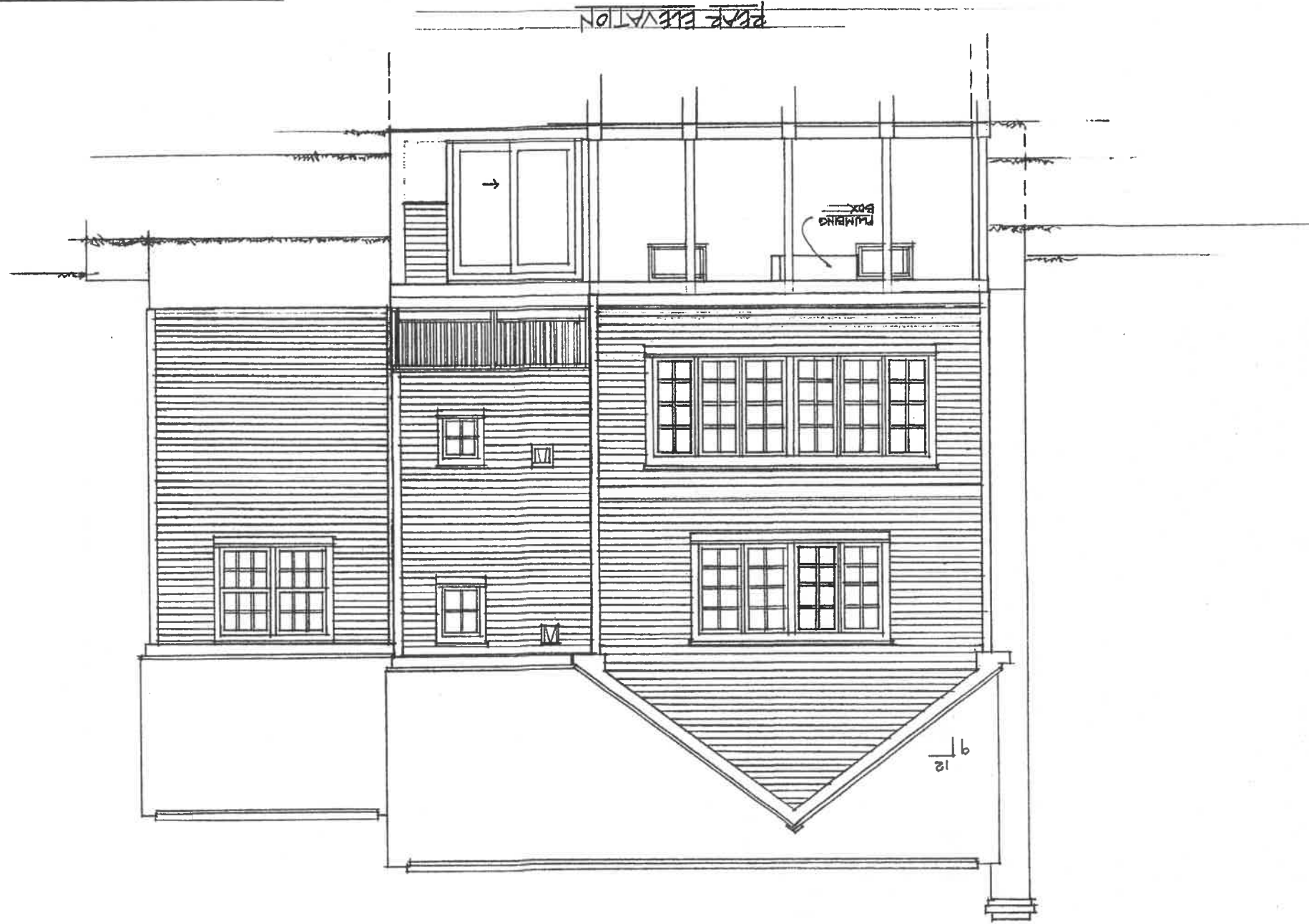
FRONT ELEVATION

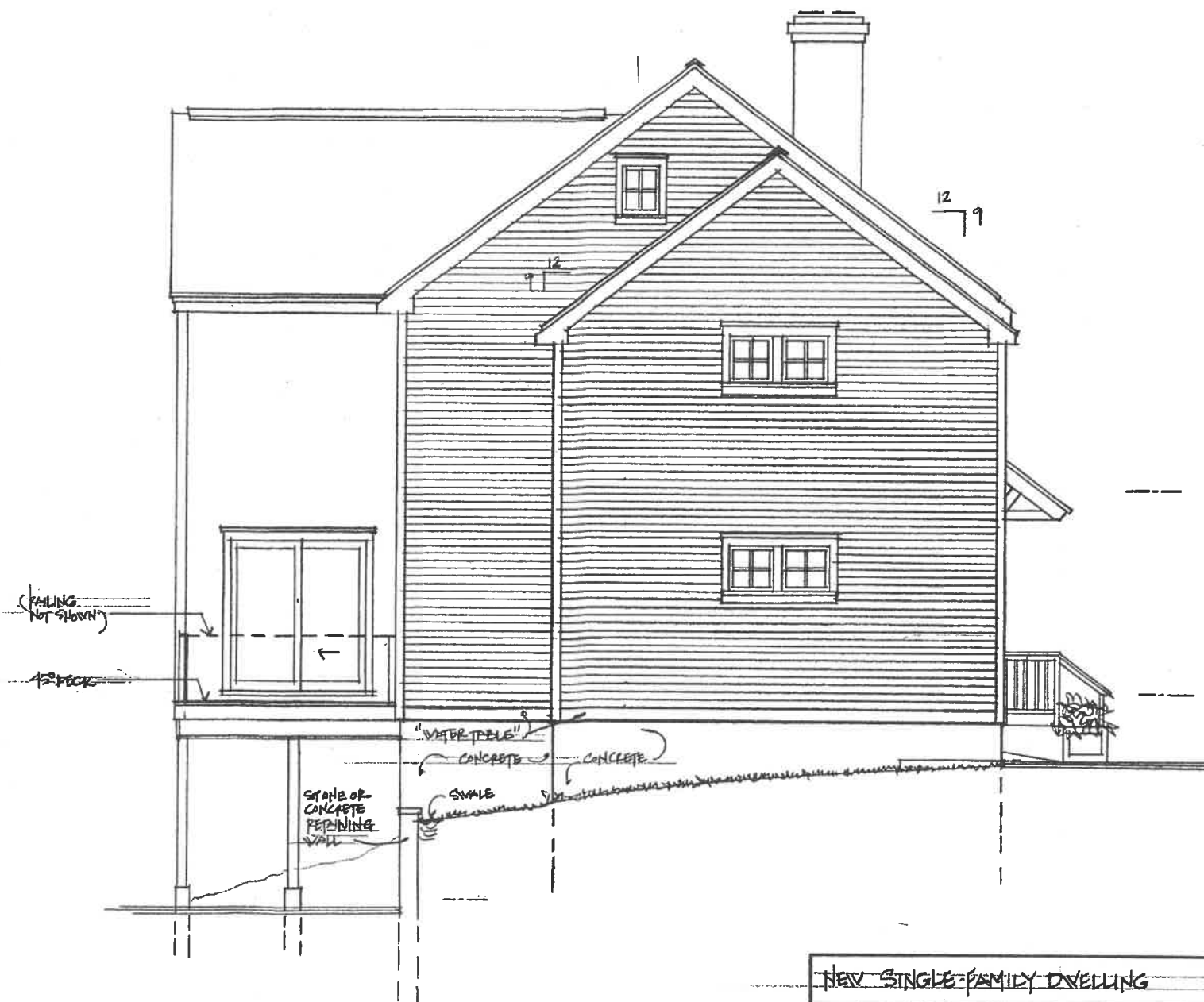




NEW SINGLE-FAMILY DWELLING			
SCALE: 1/4" = 1'-0"	APPROVED BY:	DRAWN BY: ACC	
DATE: 6 MARCH '11		REVISED: 31 MARCH '11	
1014 HIGHLAND ST., HOLLISTON, MASS.			
DRAWING NUMBER		A-4	

DRAWING NUMBER		A-5	
1014 HIGHLAND ST. HOLISTON, MASS.			
DATE:			
REVISED			
DRAWN BY: JCB		APPROVED BY: [Signature]	
NEW SINGLE FAMILY DWELLING			

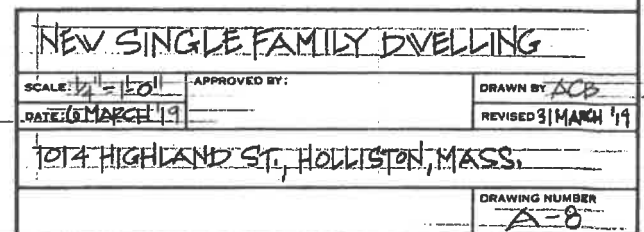
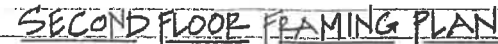


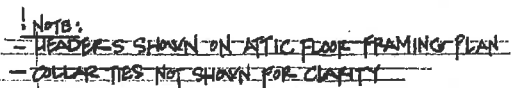


NORTH SIDE ELEVATION

NEW SINGLE-FAMILY DWELLING			
SCALE: 1/4" = 1'-0"	APPROVED BY:	DRAWN BY: ACB	
DATE: 6 MARCH '99		REVISED:	
1014 HIGHLAND ST., HOLLISTON, MASS.			
DRAWING NUMBER			A-0

Note: Box cut under plumbing fixtures





COMMONWEALTH OF MASSACHUSETTS
DANTE F. MONTUORI
STRUCTURAL
NO. 7971
REGISTERED
PROFESSIONAL ENGINEER

NEW SINGLE FAMILY DWELLING

SCALE: $\frac{1}{4}'' = 1'-0''$ APPROVED BY: _____

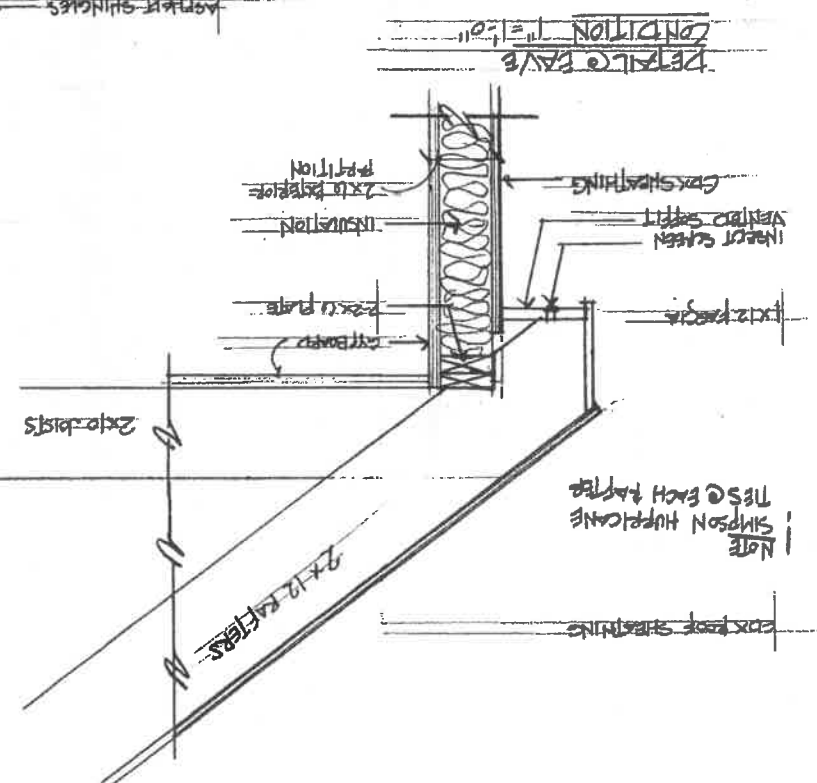
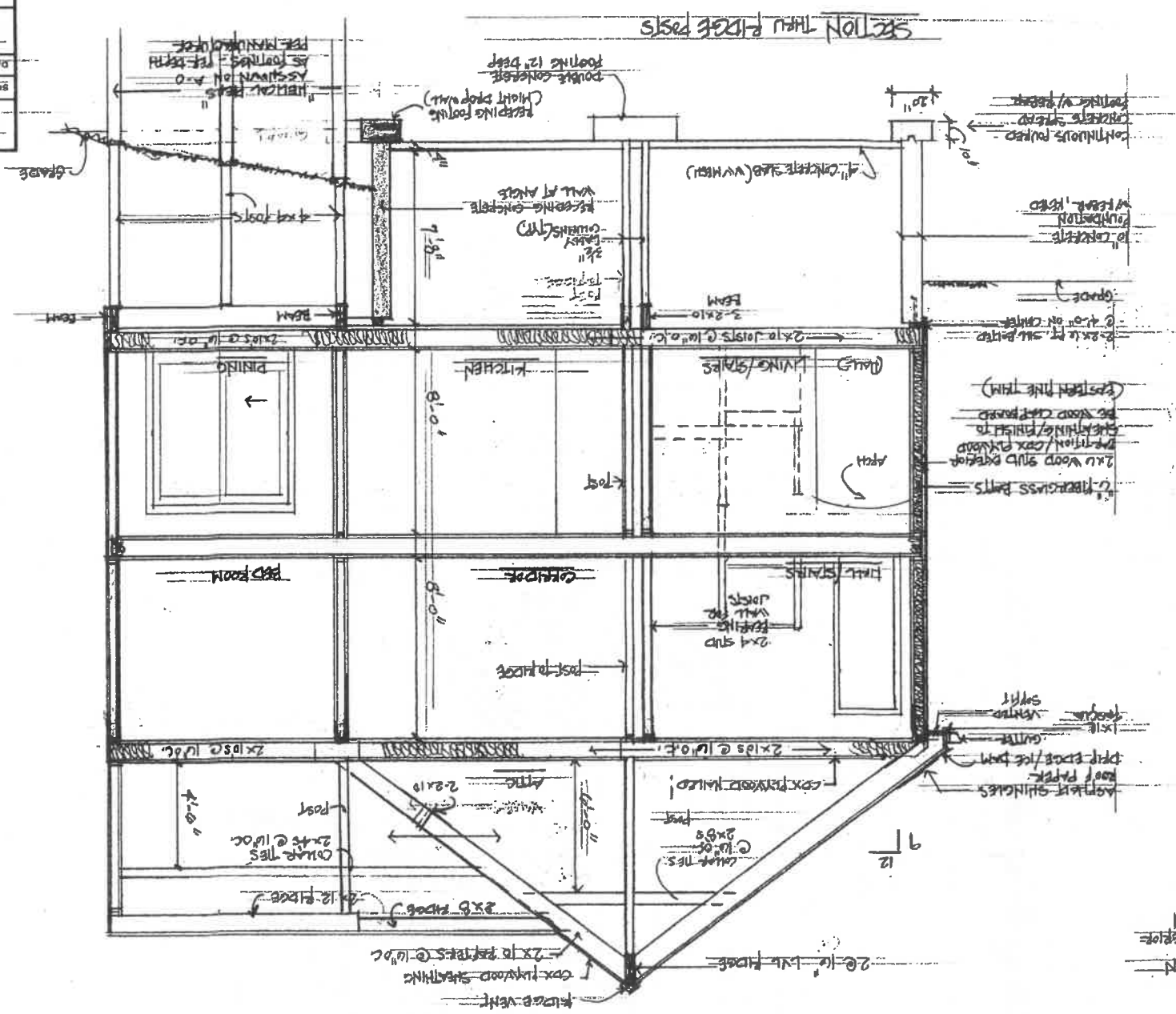
DATE: MARCH 19 _____ DRAWN BY: _____

REVISED _____

1014 HIGHLAND ST., HOLLISTON, MASS. _____

DRAWING NUMBER
A-10

DRAWING NUMBER A-11	
PROJECT NEW SINGLE-FAMILY DWELLING	
DATE: 6 MAR 1974	APPROVED BY: [Signature]
REVISIONS	DRAWN BY: ACB
1014 HIGHLAND ST., HOLLISSTON, MASS.	



DETAIL OF GABLE END WALL

SECTION THRU FRONT PORCH

