



CLIENT
Scott Goodwin

PROJECT
Goodwin- Charlotte Lake Home

PROJECT NO.
H03.001

ISSUE
8/31/20

CLIENT ADDRESS
715 Cedar Beach Road
Charlotte, VT 05445
Tel: 802.922.6336

STUDIO GOODWIN
1970 Veterans Highway
Unit A28
Levittown PA 19056
Tel: 773.358.0447





LOT COVERAGE CALCULATIONS

	Area (sf)	Percentage
Property Area	52272	100.00%
Existing Building Area	1356	2.59%
Proposed Building Area	1672	3.20%
Existing Lot Coverage	5222	9.99%
Proposed Lot Coverage	5135	9.82%

	Lot Coverage (sf)
Existing House	944
Existing Detached Garage	412
Existing Driveway	3803
Removal of Driveway	-1267
Proposed Reduced Driveway	2536
Existing Stairs to Water	63
Proposed Additional house	316
Proposed Deck and stairs (lakeside)	442
Proposed Patio	240
Proposed Walkway, steps, and patio (driveway side)	182
Total Proposed	5135

Structure Area and Volume % Increase and Total Increase

Proposed Total	1754	15031
Existing Total	711	5772
Total Increase	1043	9259
Percent Increase	146.69%	160.41%

PROPOSED STRUCTURE AREA AND VOLUME CALCULATIONS

	Area (sf)	Volume (cf)
Living Room	349	3141
Dinning Room	260	2340
Kitchen	182	1820
Foyer	60	480
Half Bathroom	26	234
First Floor Total	877	8015
Hall	207	1656
Master Bedroom	184	1472
Master Closet	40	320
Master Bathroom	107	856
Guest Bedroom	136	1088
Guest Bathroom	81	648
Laundry Closet	24	192
Office	98	784
Second Floor Total	877	7016
Proposed Total	1754	15031

Existing Structure Area and Volume Calculation

	Area (sf)	Volume (cf)
Living Room	251	2008
Sun Room	168	1428
Kitchen	41	328
Foyer	47	376
3/4 Bathroom	48	384
Bedroom 1	78	624
Bedroom 2	78	624
Existing Floor Total	711	5772

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- C. 1.1Proposed Condition Site Plan
- C. 1.2Potential Well Location Markup
- C. 1.3Erosion Control Plan
- C. 2.0Erosion Control Notes and Details
- C. 2.1Details
- C. 2.2Details
- C. 3.0Specifications
- C. 3.1Specifications

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- E.02Existing Elevations
- E.03Existing Elevations- Photos

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- A.02Second Floor Plan
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- A.04North Elevation
- A.05East Elevation
- A.06South Elevation
- A.07Window Schedule
- A.08West Elevation-Rendered
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- A.10East Elevation-Rendered
- A.11South Elevation-Rendered
- A.12South Perspective
- A.13North Perspective
- A.14West Perspective
- A.15East Perspective

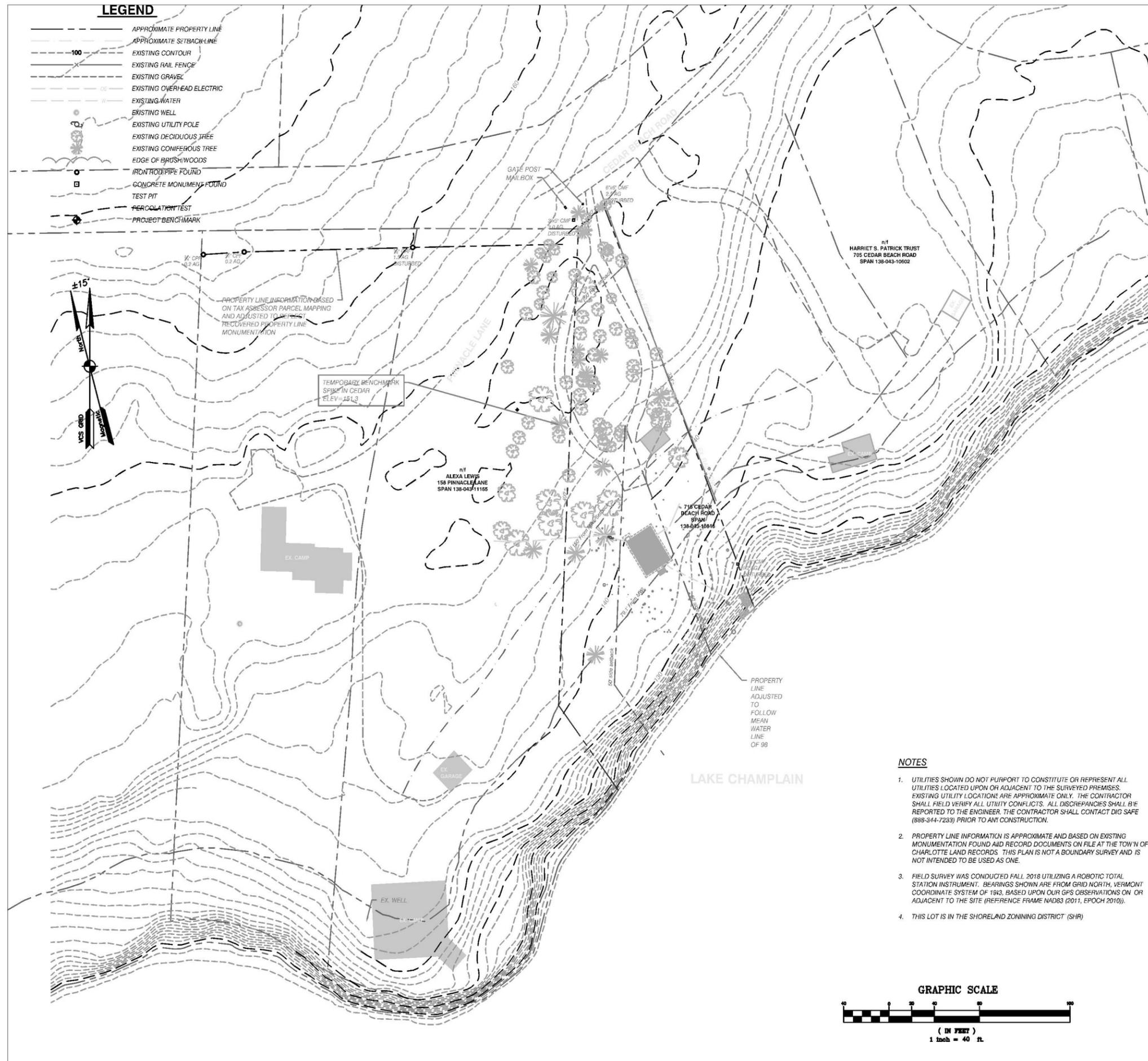
Studio Goodwin
1970 Veterans Highway
Unit A28
Levittown PA 19056
Tel: 773.358.0447

CLIENT
Scott Goodwin
715 Cedar Beach Road
Pleasanton, CA 94566
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ISSUE
June 4th, 2020
RE-ISSUE
August 31st, 2020

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DRAWN BY
JG
DESCRIPTION
Sheet Index



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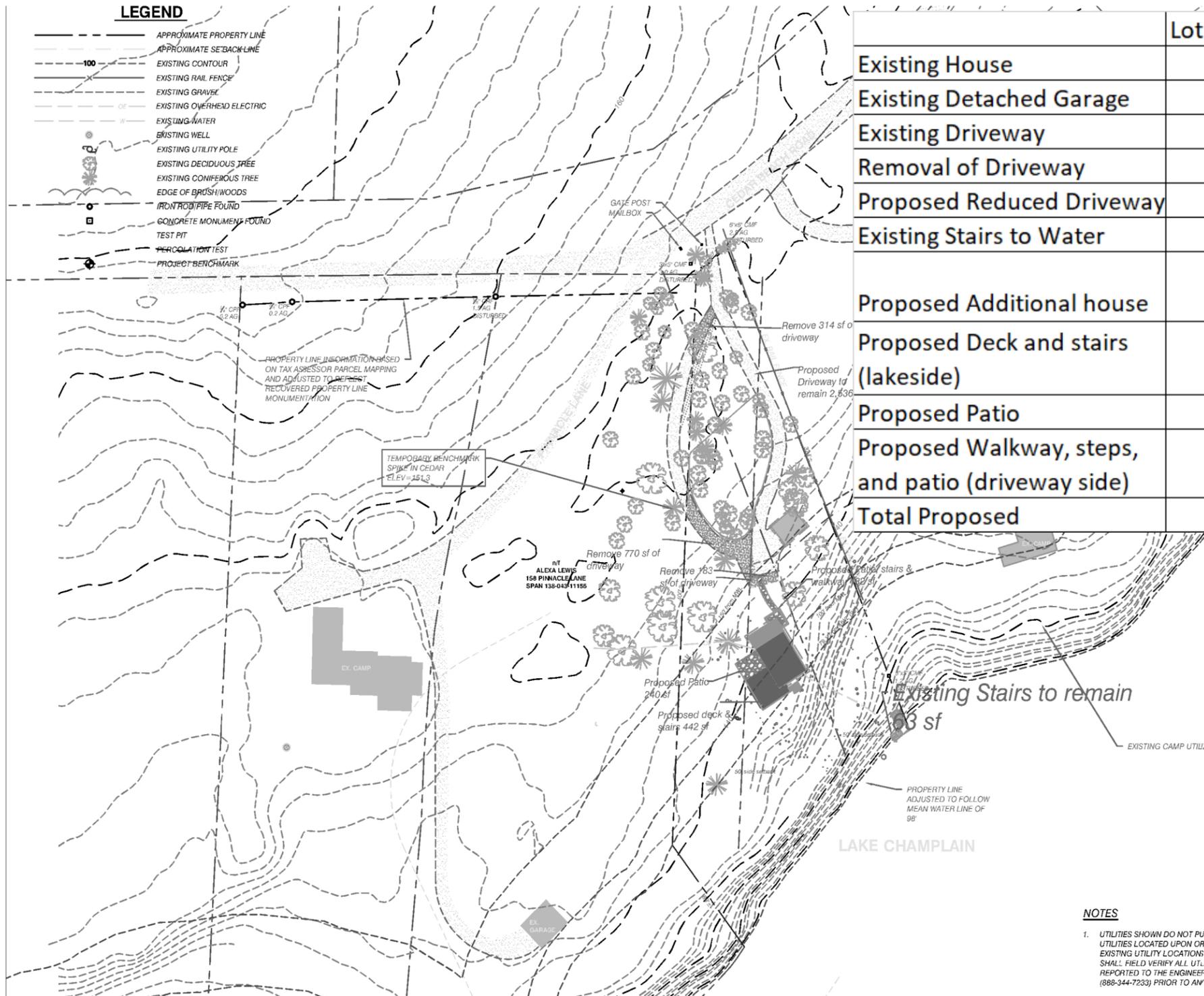
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JG

DESCRIPTION
Existing Site Plan



LEGEND

- APPROXIMATE PROPERTY LINE
- APPROXIMATE SETBACK LINE
- 100 --- EXISTING CONTOUR
- EXISTING RAIL FENCE
- EXISTING GRAVEL
- OF --- EXISTING OVERHEAD ELECTRIC
- W --- EXISTING WATER
- EXISTING WELL
- EXISTING UTILITY POLE
- EXISTING DECIDUOUS TREE
- EXISTING CONIFEROUS TREE
- EDGE OF BRUSH WOODS
- IRON ROD/PIPE FOUND
- CONCRETE MONUMENT FOUND
- TEST PIT
- PERCOLATION TEST
- PROJECT BENCHMARK

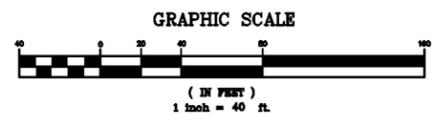


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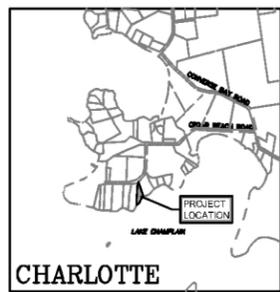
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NOTES

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2. PROPERTY LINE INFORMATION IS APPROXIMATE AND BASED ON EXISTING MONUMENTATION FOUND AND RECORD DOCUMENTS ON FILE AT THE TOWN OF CHARLOTTE LAND RECORDS. THIS PLAN IS NOT A BOUNDARY SURVEY AND IS NOT INTENDED TO BE USED AS ONE.
3. FIELD SURVEY WAS CONDUCTED FALL 2018 UTILIZING A ROBOTIC TOTAL STATION INSTRUMENT. BEARINGS SHOWN ARE FROM GRID NORTH, VERMONT COORDINATE SYSTEM OF 1983, BASED UPON OUR GPS OBSERVATIONS ON OR ADJACENT TO THE SITE (REFERENCE FRAME NAD83 (2011, EPOCH 2010)).
4. THIS LOT IS IN THE SHORELAND ZONING DISTRICT (SHR)



715 CEDAR BEACH ROAD
CHARLOTTE, VT 05445



CHARLOTTE
LOCATION MAP
1" = 2000'

EXISTING AND PROPOSED CONDITIONS SITE PLAN

1" = 40' Site Plan



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JG

DESCRIPTION
Proposed Site Plan

Shirley Bruce - Test Pits
715 Cedar Beach Road, Charlotte
September 5, 2018

- D. Marshall
- TP #1
0"-8" Loose dark brown very fine sandy loam
8"-14" Loose brown very fine sandy loam
14"-32" Medium compact brown loam and rock fragments
SHGWT - None Seeps - None
Roots to 26" Ledge at 32"
- TP #2
0"-9" Loose dark brown very fine sandy loam
9"-14" Loose light brown very fine sandy loam and rock fragments
14"-26" Medium compact brown loam and rock fragments
SHGWT - None Seeps - None
Roots to 26" Ledge at 26"
- TP #3
0"-8" Loose dark brown very fine sandy loam
8"-16" Loose to medium compact brown very fine sandy loam and rock fragments
16"-26" Medium compact brown loam
SHGWT - None Seeps - None
Roots to 26" Ledge at 26"
- TP #4
0"-6" Loose dark brown very fine sandy loam
6"-12" Loose to medium compact light brown very fine sandy loam
12"-18" Medium compact brown loam
18"-35" Compact gray-brown silt loam
SHGWT - 12" Seeps - None
Roots to 34" Ledge at 35"
- TP #5
0"-8" Loose dark brown very fine sandy loam
8"-14" Medium compact light brown very fine sandy loam
14"-22" Medium compact brown loam
SHGWT - None Seeps - None
Roots to 20" Ledge at 22"
- TP #6
0"-8" Loose brown very fine sandy loam
8"-20" Loose medium compact brown loam with rock fragments
SHGWT - None Seeps - None
Roots to 20" Ledge at 20"
- TP #7
0"-8" Loose dark brown fine sandy loam
8"-20" Loose brown very fine sandy loam and rock fragments
SHGWT - None Seeps - None
Roots to 20" Ledge at 20"
- TP #8
0"-8" Loose dark brown very fine sandy loam
8"-15" Loose to medium compact light brown loam
15"-24" Medium compact brown loam and rock fragments
SHGWT - None Seeps - None
Roots to 24" Ledge at 24"
- TP #9
0"-10" Loose brown very fine sandy loam
10"-16" Loose orange-brown very fine sandy loam
16"-20" Medium compact rock fragments and gray brown silt
SHGWT - None Seeps - None
Roots to 20" Ledge at 20"
- TP #10
0"-10" Loose dark brown very fine sandy loam
10"-14" Loose light brown very fine sandy loam
14"-24" Loose light brown fine sandy loam and small rock fragments
24"-30" Medium compact brown loam and rock fragments
30"-32" Compact gray brown silt loam
SHGWT - None Seeps - None
Roots to 30" Ledge at 32"
- TP #11
0"-6" Loose brown loam
6"-24" Loose brown fine sandy loam and small rock fragments
24"-39" Loose to medium compact gray-brown fine sandy loam and shells
SHGWT - None Seeps - None
Roots to 38" Ledge at 39"
- TP #12
0"-5" Loose dark brown fine sandy loam
5"-16" Loose to medium compact tan very fine sandy loam
16"-30" Loose gray brown fine sandy loam and rock fragments
30"-35" Compact brown silt with shells
SHGWT - None Seeps - None
Roots to 29" Ledge at 35"
- TP #13
Ledge at 14"
- TP #13A
0"-5" Loose dark brown loam
5"-12" Loose light brown fine sandy loam
12"-26" Loose light brown fine sandy loam and rock fragments
26"-31" Medium compact light brown loam
SHGWT - 26" Seeps - None
Roots to 26" Ledge at 31"

PERC TEST INFORMATON

PT#1 8.1 MIN/INCH
PT#2 13.2 MIN/INCH

LEGEND

- APPROXIMATE PROPERTY LINE
- APPROXIMATE SETBACK LINE
- - - EXISTING CONTOUR
- - - EXISTING RAIL FENCE
- - - EXISTING GRAVEL
- OE --- EXISTING OVERHEAD ELECTRIC
- W --- EXISTING WATER
- EXISTING WELL
- EXISTING UTILITY POLE
- EXISTING DECIDUOUS TREE
- EXISTING CONIFEROUS TREE
- EDGE OF BRUSHWOODS
- IRON ROD/PIPE FOUND
- CONCRETE MONUMENT FOUND
- TEST PIT
- PERCOLATION TEST
- PROJECT BENCHMARK

PROPERTY LINE INFORMATION BASED ON TAX ASSESSOR PARCEL MAPPING AND ADJUSTED TO REFLECT RECOVERED PROPERTY LINE MONUMENTATION

TEMPORARY BENCHMARK SPIKE IN CEDAR ELEV=151.3

APPROXIMATE LOCATION OF PERMITTED WASTEWATER MOUND FROM PLANS PREPARED BY WAITE-HEINDEL ENVIRONMENTAL

n/t ALEXA LEWIS 158 PINNACLE LANE SPAN 138-043-11155

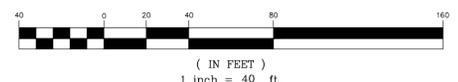
EX. CAMP

LAKE CHAMPLAIN

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- THIS LOT IS IN THE SHORELAND ZONING DISTRICT (SHR)

GRAPHIC SCALE



SITE ENGINEER:



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

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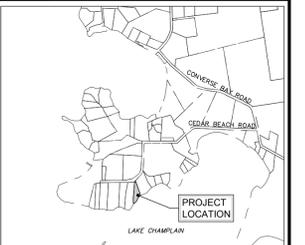
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DSM

CLIENT:
ESTATE OF SHIRLEY L. BRUCE

PROJECT:

WASTEWATER SYSTEM

715 CEDAR BEACH ROAD
CHARLOTTE, VT 05445



CHARLOTTE

LOCATION MAP
1" = 200'

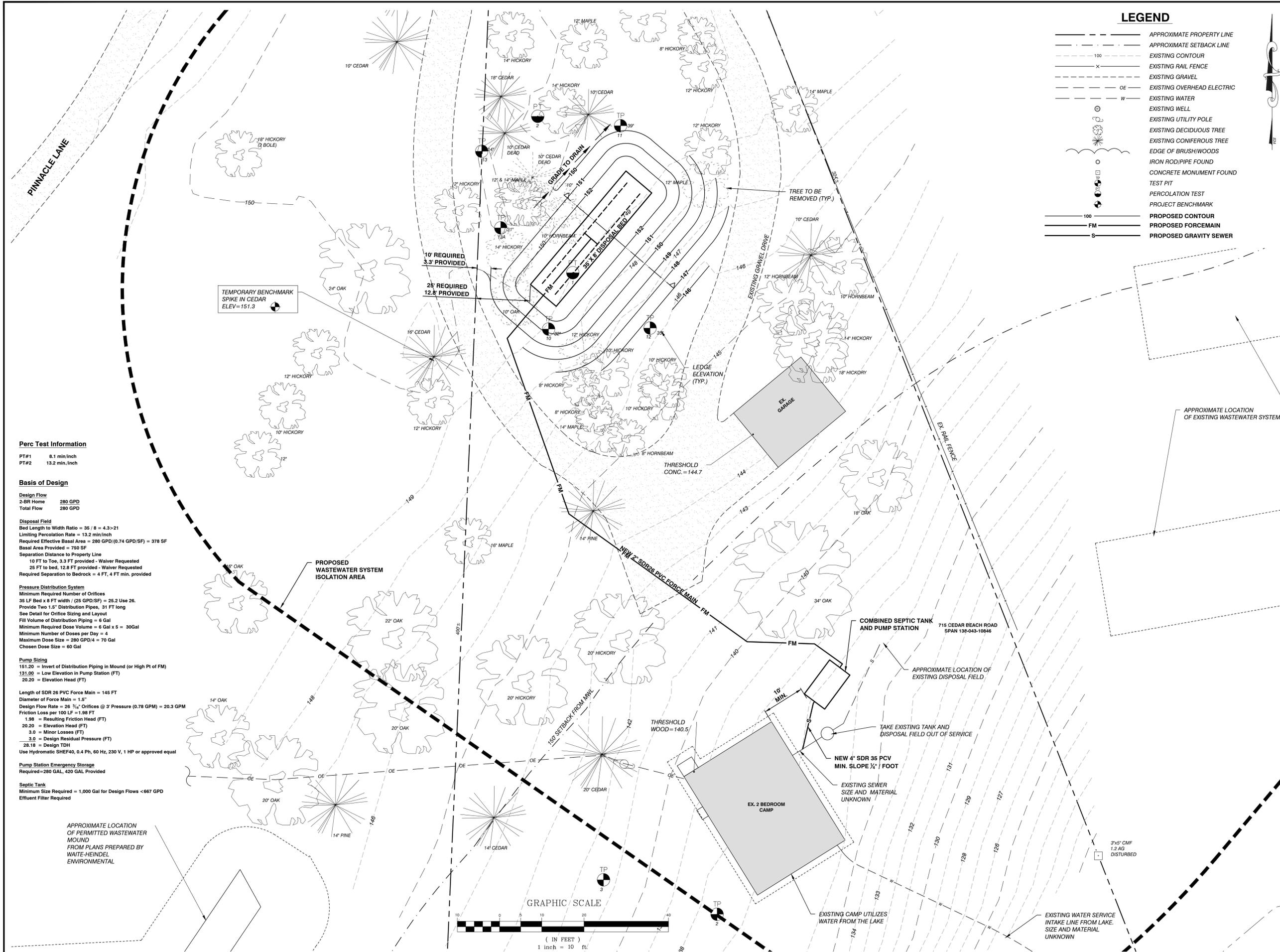
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EXISTING AND PROPOSED CONDITIONS SITE PLAN

DATE
8/31/20
SCALE
1" = 40'
PROJ. NO.
18198

DRAWING NUMBER

C1.0



LEGEND

- APPROXIMATE PROPERTY LINE
- - - APPROXIMATE SETBACK LINE
- - - 100 EXISTING CONTOUR
- x - EXISTING RAIL FENCE
- - - EXISTING GRAVEL
- - - OE EXISTING OVERHEAD ELECTRIC
- - - W EXISTING WATER
- EXISTING WELL
- EXISTING UTILITY POLE
- EXISTING DECIDUOUS TREE
- EXISTING CONIFEROUS TREE
- EDGE OF BRUSH/WOODS
- IRON ROD/PIPE FOUND
- CONCRETE MONUMENT FOUND
- TEST PIT
- PERCOLATION TEST
- PROJECT BENCHMARK
- PROPOSED CONTOUR
- FM PROPOSED FORCEMAIN
- S PROPOSED GRAVITY SEWER

SITE ENGINEER:



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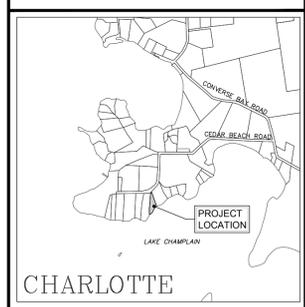
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CHECKED	DSM
APPROVED	DSM

CLIENT:
ESTATE OF SHIRLEY L. BRUCE

PROJECT:
WASTEWATER SYSTEM

715 CEDAR BEACH ROAD
CHARLOTTE, VT 05445



CHARLOTTE
LOCATION MAP
1" = 2000'

DATE	CHECKED	REVISION

PROPOSED CONDITIONS SITE PLAN

DATE	8/31/20	DRAWING NUMBER	C1.1	
SCALE	1" = 10'	PROJ. NO.		18198

Perc Test Information

PT#1	8.1 min./inch
PT#2	13.2 min./inch

Basis of Design

Design Flow	2-BR Home	280 GPD
Total Flow		280 GPD

Disposal Field

Bed Length to Width Ratio = 35 / 8 = 4.3 > 21
Limiting Percolation Rate = 13.2 min./inch
Required Effective Basal Area = 280 GPD / (0.74 GPD/SF) = 378 SF
Basal Area Provided = 750 SF
Separation Distance to Property Line
10 FT to Toe, 3.3 FT provided - Waiver Requested
25 FT to bed, 12.8 FT provided - Waiver Requested
Required Separation to Bedrock = 4 FT, 4 FT min. provided

Pressure Distribution System

Minimum Required Number of Orifices
35 LF Bed x 8 FT width / (25 GPD/SF) = 25.2 Use 26.
Provide Two 1.5" Distribution Pipes, 31 FT long
See Detail for Orifice Sizing and Layout
Fill Volume of Distribution Piping = 6 Gal
Minimum Required Dose Volume = 6 Gal x 5 = 30Gal
Minimum Number of Doses per Day = 4
Maximum Dose Size = 280 GPD/4 = 70 Gal
Chosen Dose Size = 60 Gal

Pump Sizing

151.20 = Invert of Distribution Piping in Mound (or High Pt of FM)
131.00 = Low Elevation in Pump Station (FT)
20.20 = Elevation Head (FT)

Length of SDR 26 PVC Force Main = 145 FT

Diameter of Force Main = 1.5"
Design Flow Rate = 26 3/4" Orifices @ 3" Pressure (0.78 GPM) = 20.3 GPM
Friction Loss per 100 LF = 1.98 FT
1.98 = Resulting Friction Head (FT)
20.20 = Elevation Head (FT)
3.0 = Minor Losses (FT)
3.0 = Design Residual Pressure (FT)
28.18 = Design TDH
Use Hydromatic SHEF40, 0.4 Ph, 60 Hz, 230 V, 1 HP or approved equal

Pump Station Emergency Storage

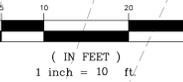
Required=280 GAL, 420 GAL Provided

Septic Tank

Minimum Size Required = 1,000 Gal for Design Flows < 667 GPD
Effluent Filter Required

APPROXIMATE LOCATION OF PERMITTED WASTEWATER MOUND FROM PLANS PREPARED BY WAITE-HEINDEL ENVIRONMENTAL

GRAPHIC SCALE



Shirley Bruce - Test Pits
715 Cedar Beach Road, Charlotte
September 5, 2018

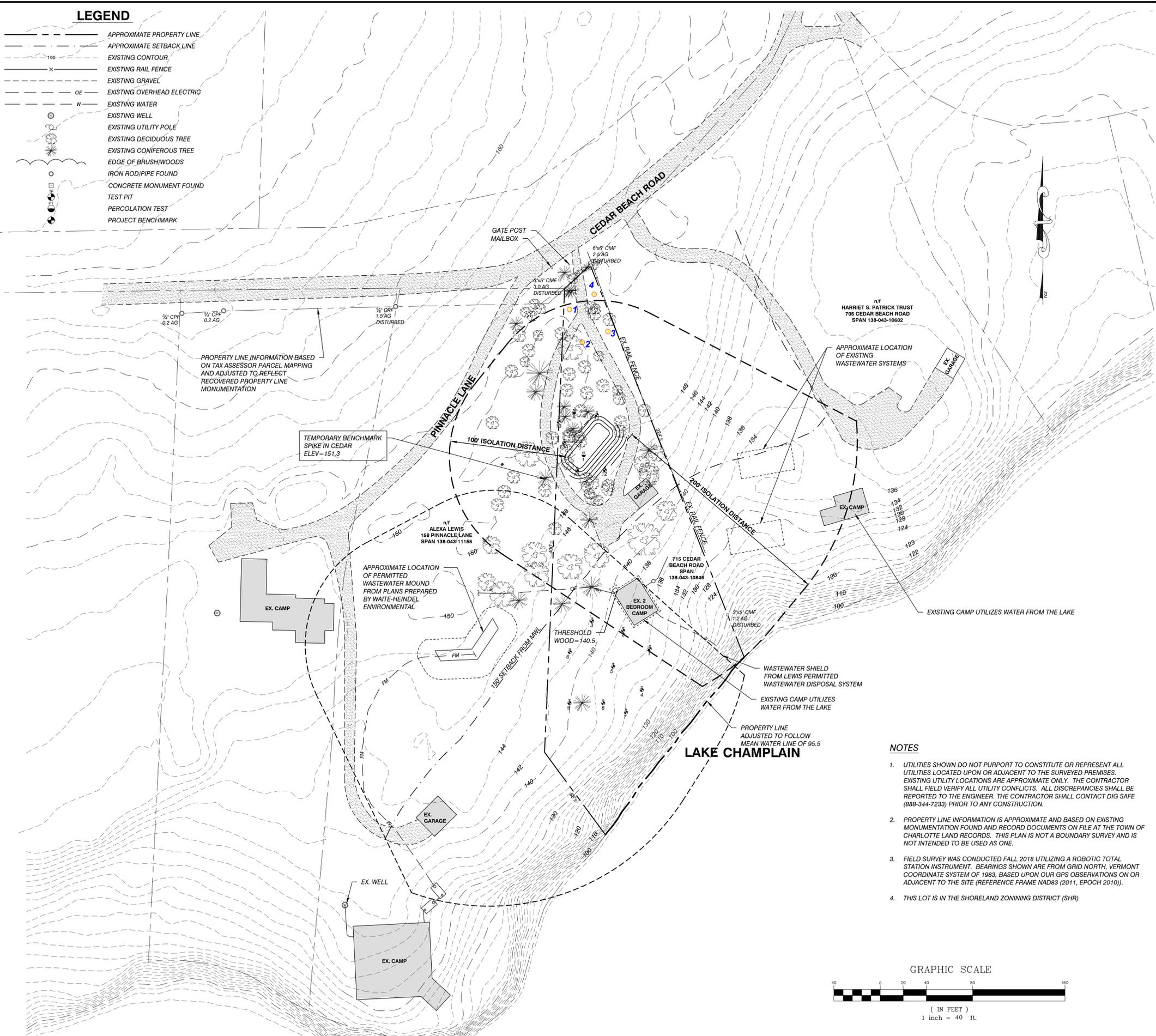
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14"-32" Medium compact brown loam and rock fragments
SHGWT - None Seeps - None
Roots to 26" Ledge at 32"
- TP #2
0"-9" Loose dark brown very fine sandy loam
9"-14" Loose light brown very fine sandy loam and rock fragments
14"-26" Medium compact brown loam and rock fragments
SHGWT - None Seeps - None
Roots to 26" Ledge at 26"
- TP #3
0"-8" Loose dark brown very fine sandy loam
8"-16" Loose to medium compact brown very fine sandy loam and rock fragments
16"-26" Medium compact brown loam
SHGWT - None Seeps - None
Roots to 26" Ledge at 26"
- TP #4
0"-6" Loose dark brown very fine sandy loam
6"-12" Loose to medium compact light brown very fine sandy loam
12"-18" Medium compact brown loam
18"-35" Compact gray-brown silt loam
SHGWT - 12" Seeps - None
Roots to 34" Ledge at 35"
- TP #5
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8"-14" Medium compact light brown very fine sandy loam
14"-22" Medium compact brown loam
SHGWT - None Seeps - None
Roots to 20" Ledge at 22"
- TP #6
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SHGWT - None Seeps - None
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- TP #7
0"-8" Loose dark brown fine sandy loam
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8"-15" Loose to medium compact light brown loam
15"-24" Medium compact brown loam and rock fragments
SHGWT - None Seeps - None
Roots to 24" Ledge at 24"
- TP #9
0"-10" Loose brown very fine sandy loam
10"-16" Loose orange-brown very fine sandy loam
16"-20" Medium compact rock fragments and gray brown silt
SHGWT - None Seeps - None
Roots to 20" Ledge at 20"
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30"-35" Compact brown silt with shells
SHGWT - None Seeps - None
Roots to 29" Ledge at 35"
- TP #13
Ledge at 14"
- TP #13A
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5"-12" Loose light brown fine sandy loam
12"-26" Loose light brown fine sandy loam and rock fragments
26"-31" Medium compact light brown loam
SHGWT - 26" Seeps - None
Roots to 26" Ledge at 31"

PERC TEST INFORMATION

PT#1 8.1 MIN/INCH
PT#2 13.2 MIN/INCH

LEGEND

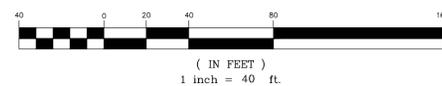
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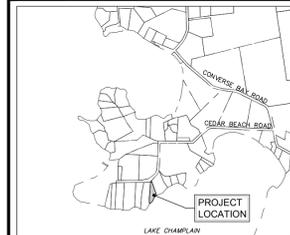
CLIENT:

ESTATE OF SHIRLEY
L. BRUCE

PROJECT:

WASTEWATER
SYSTEM

715 CEDAR BEACH ROAD
CHARLOTTE, VT 05445



CHARLOTTE

LOCATION MAP

1" = 200'

DATE	CHECKED	REVISION

Potential Well
Location
Mark-up

DATE

8/31/20

SCALE

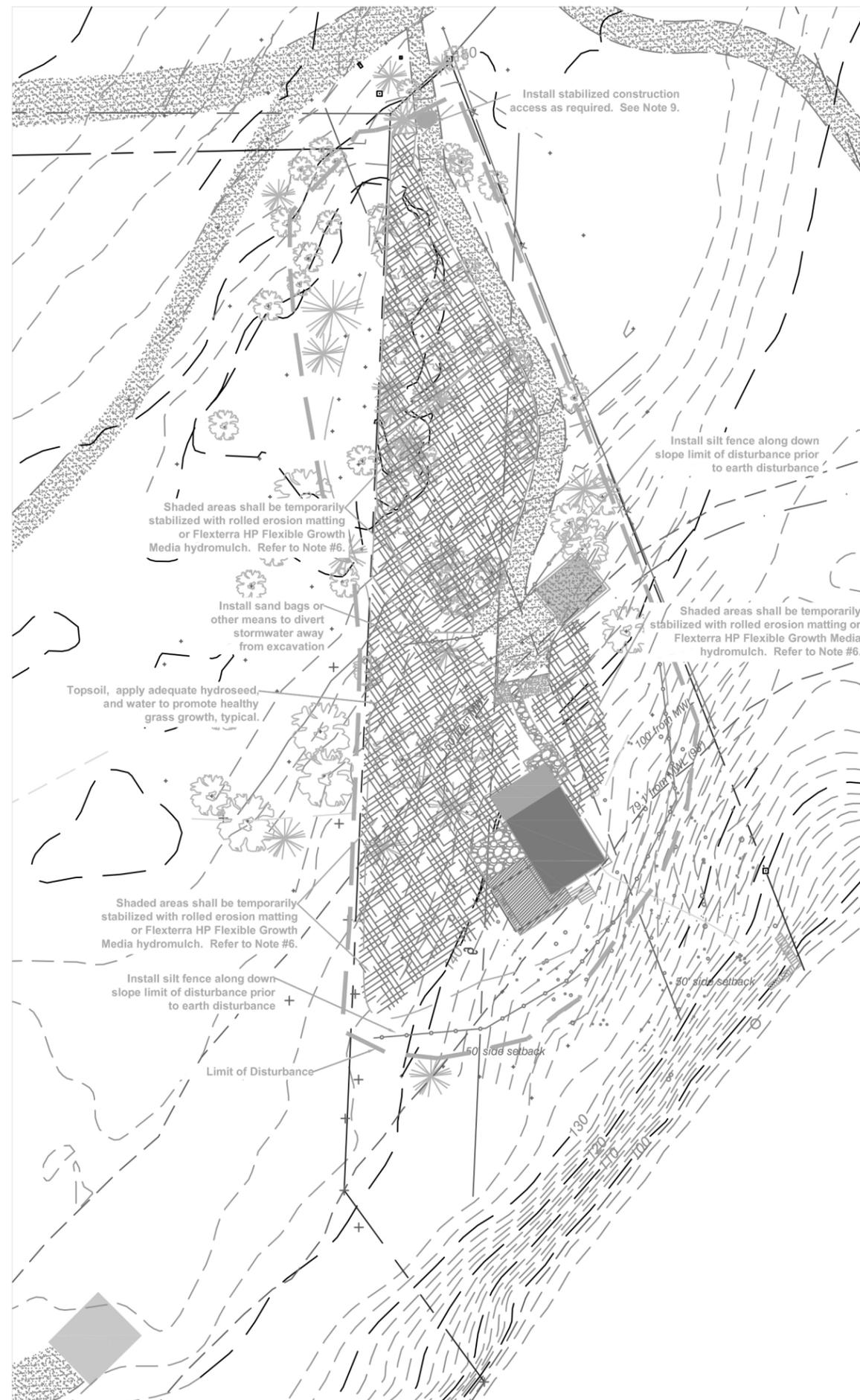
1" = 40'

PROJ. NO.

18198

DRAWING NUMBER

C1.2



1. Contractor shall be responsible for complying with all State and local erosion prevention and sediment control standards and permit requirements during construction. The Erosion Prevention & Sediment Control Permit shall be posted near the construction entrance, or in a location visible to the public.
2. The Contractor shall be the On-site Coordinator for the project and shall be responsible for all required inspections (minimum weekly and after any storm event that produces a discharge) maintenance, and reporting.
3. The limit of disturbance shall be clearly defined by Contractor's surveyor prior to clearing. Clearing and grubbing shall not begin until disturbance limits and sediment controls are in place. All roots, stumps and deleterious materials shall be removed from the site. The Contractor shall minimize the amount of disturbed land at any given time.
4. The erosion prevention and sediment control practices shown on these plans are the minimum required for the project. The Contractor shall employ and maintain as many best management practices as necessary to prevent soil from leaving the construction site. If evidence is found of sediment tracking or eroded soil leaving the construction site, the Engineer may direct Site Contractor to implement additional best management practices at no additional cost to Owner.
5. All areas of disturbance shall be permanently or temporarily stabilized as soon as possible and within 48 hours of final grading. All areas of disturbance shall be at least temporarily stabilized 14 days after initial disturbance during the summer or daily during winter construction unless the following exceptions apply:
 - a. Stabilization is not required if earthwork is to continue in the area in the next 24 hours and there is no precipitation forecast in the next 24 hours.
 - b. Stabilization is not required if the work is occurring in a self-contained excavation (i.e. no outlet) with a depth of 2 ft. or greater (e.g. house foundation excavation, utility trenches). Stabilization measures shall include mulch and netting, erosion control matting, crushed stone, gravel, or pavement.
6. Unless specifically indicated on the plans acceptable methods of stabilization shall include:
 - STRAW Mulching - 2 tons per acre. Only STRAW mulch is allowed. Approximately 2" uniform thickness. Only allowed on relatively flat areas with minimum upslope watershed. Mulch must be properly secured with netting to prevent material from being blown away by wind (windthrow).
 - Hydroseeding* - Preferred Method of Temporary Stabilization. Apply at the manufacturer's recommended application rate. Contractor shall provide evidence of proper application rate. Hydroseeding must be accompanied by erosion control matting in areas of concentrated flow. Hydroseeding on slopes 3:1 and steeper, as shaded on the plan, and all hydroseeding after October 1st must be done with a dense cover of hydromulch, Flexterra High Performance, Flexible Growth Media, or approved equal.
 - Erosion control matting - NAG S75BN may be applied to slopes less than 3:1 (H:V). NAG S150BN matting must be applied to all slopes 3:1 (H:V) or greater (unless otherwise indicated) and in areas of concentrated flow. All rolled erosion control matting must be removed prior to first mowing.
 - Crushed stone or crushed gravel - Typically used for temporary access roads and construction staging areas.
7. The Contractor shall use water for dust control.
8. A stabilized construction entrance (See Detail) shall be installed and maintained at all construction access locations where construction vehicles travel off the existing hardscape. Contractor shall be responsible for installing crushed stone to provide stable areas for construction vehicle traffic, staging, and storage. The Contractor is responsible for providing and maintaining sufficient stone to prevent rutting and sediment tracking.
9. Any paved roads used by construction vehicles shall be swept daily, or at a greater frequency, if dirt or gravel is tracked from the site. The swept debris shall be removed from face of curb, if applicable, before any forecasted rain event.
10. All temporary erosion and sediment control measures shall be removed within 30 days after final stabilization or after the measures are no longer needed, unless otherwise authorized.
11. All sediment removed from sediment control practices shall be placed in an approved soil disposal area.
12. All areas that do not have established vegetation by October 15th must be stabilized in accordance with the Winter Stabilization requirements outlined in the Low Risk Site Handbook. See Details.
13. After permanent seeding the Contractor shall be responsible for watering to ensure adequate vegetative growth. Weed growth is not considered acceptable vegetative growth.
14. Water from dewatering activities that flows off site must be clear. Turbid, or visibly discolored water must not be pumped into storm sewers. Discolored water must be pumped to a sediment filter bag, DirtBag or approved equal, in the location indicated on the plans or other area approved by the Engineer that is located away from exposed or disturbed soil.
15. The perimeter of the site and all BMPs will be inspected at the end of each workday to ensure that sediment will not leave the site. If sediment has traveled beyond the site boundary, it shall be swept up or otherwise removed and deposited on-site in an upgradient area at the end of each workday.

Legend

-  Existing Contours
-  Limit of Disturbance
-  Temporary Silt Fence
-  Straw wattles
-  Crushed Stone Stabilization
-  Rolled Erosion Control Matting



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ISSUE
June 4th, 2020

RE-ISSUE
August 31st, 2020

PROJECT NO.
H03.001

PROJECT
Goodwin- Charlotte
Lake Home

DRAWN BY
JG

DESCRIPTION
Erosion Control Plan



Introduction

This project is subject to the terms and conditions of the authorization from the State of Vermont to discharge construction related storm water runoff.

Coverage under the State Construction General Permit 3-9020 is required for any construction activity that disturbs 1 or more acres of land, or is part of a larger development plan that will disturb 1 or more acres.

This project has been deemed to qualify as a Low Risk Site which is subject to the erosion prevention and sediment control (EPSC) standards set for in the State of Vermont's **Low Risk Site Handbook for Erosion Prevention and Sediment Control**

The following narrative and implementation requirements represent the minimum standard for which this site is required to be maintained as regulated by the State of Vermont.

Any best management practices (BMP's) depicted on the project's EPSC Site plan which go beyond the Handbook requirements are considered to be integral to the management of the site and represent components of the municipal EPSC approval for the project which shall be implemented.

The EPSC plan depicts one snap shot in time of the site. All construction sites are fluid in their day to day exposures and risks as it relates to minimizing sediment loss from the site. **It is the responsibility of the Contractor to implement the necessary BMP's to comply with the Low Risk Handbook standards outlined on this sheet based on the interim site disturbance conditions which may or may not be shown on the EPSC Site Plan.**

Specific BMP's which are critical to allowing the project to be considered a Low risk site include the items checked below:

- Limit the amount of disturbed earth to two acres or less at any one time.
- There shall be a maximum of 7 consecutive days of disturbed earth exposure in any location before temporary or final stabilization is implemented.

1. Mark Site Boundaries

Purpose:

Mark the site boundaries to identify the limits of construction. Delineating your site will help to limit the area of disturbance, preserve existing vegetation and limit erosion potential on the site.

How to comply:

Before beginning construction, walk the site boundaries and flag trees, post signs, or install orange safety fence. Fence is required on any boundary within 50 feet of a stream, lake, pond or wetland, unless the area is already developed (existing roads, buildings, etc.)

2. Limit Disturbance Area

Purpose:

Limit the amount of soil exposed at one time to reduce the potential erosion on site.

Requirements:

The permitted disturbance area is specified on the site's written authorization to discharge. Only the acreage listed on the authorization form may be exposed at any given time.

How to comply:

Plan ahead and phase the construction activities to ensure that no more than the permitted acreage is disturbed at one time. Be sure to properly stabilize exposed soil with seed and mulch or erosion control matting before beginning work in a new section of the site.

3. Stabilize Construction Entrance

Purpose:

A stabilized construction entrance helps remove mud from vehicle wheels to prevent tracking onto streets.

Requirements:

If there will be any vehicle traffic off of the construction site, you must install a stabilized construction entrance before construction begins.

How to install

Rock Size: Use a mix of 1 to 4 inch stone

Depth: 8 inches minimum

Width: 12 feet minimum

Length: 40 feet minimum (or length of driveway, if shorter)

Geotextile: Place filter cloth under entire gravel bed

Maintenance:

Redress with clean stone as required to keep sediment from tracking onto the street.

4. Install Silt Fence

Purpose:

Silt fences intercept runoff and allow suspended sediment to settle out.

Requirements:

- Silt fence must be installed:
 - on the downhill side of the construction activities
 - between any ditch, swale, storm sewer inlet, or waters of the State and the disturbed soil

* Hay bales must not be used as sediment barriers due to their tendency to degrade and fall apart.

Where to place:

- Place silt fence on the downhill edge of bare soil. At the bottom of slopes, place fence 10 feet downhill from the end of the slope (if space is available).
- Ensure the silt fence catches all runoff from bare soil.
- Maximum drainage area is 1/4 acre for 100 feet of silt fence.
- Install silt fence across the slope (not up and down hills)
- Install multiple rows of silt fence on long hills to break up flow.
- Do not install silt fence across ditches, channels, or streams or in stream buffers.

How to install silt fence:

- Dig a trench 6 inches deep across the slope
- Unroll silt fence along the trench
- Ensure stakes are on the downhill side of the fence
- Join fencing by rolling the end stakes together
- Drive stakes in against downhill side of trench
- Drive stakes until 16 inches of fabric is in trench
- Push fabric into trench; spread along bottom
- Fill trench with soil and pack down

Maintenance:

- Remove accumulated sediment before it is halfway up the fence.
- Ensure that silt fence is trenched in ground and there are no gaps.

5. Divert Upland Runoff

Purpose:

Diversion berms intercept runoff from above the construction site and direct it around the disturbed area. This prevents clean water from becoming muddied with soil from the construction site.

Requirements:

If storm water runs onto your site from upslope areas and your site meets the following two conditions, you must install a diversion berm before disturbing any soil.

- You plan to have one or more acres of soil exposed at any one time (excluding roads).
- Average slope of the disturbed area is 20% or steeper.

How to install:

- Compact the berm with a shovel or earth-moving equipment.
- Seed and mulch berm or cover with erosion control matting immediately after installation.
- Stabilize the flow channel with seed and straw mulch or erosion control matting. Line the channel with 4 inch stone if the channel slope is greater than 20%.
- Ensure the berm drains to an outlet stabilized with riprap. Ensure that there is no erosion at the outlet.
- The diversion berm shall remain in place until the disturbed areas are completely stabilized.

6. Slow Down Channelized Runoff

Purpose:

Stone check dams reduce erosion in drainage channels by slowing down the storm water flow.

Requirements:

If there is a concentrated flow (e.g. in a ditch or channel) of storm water on your site, then you must install stone check dams. Hay bales must not be used as check dams.

How to install:

- Height: No greater than 2 feet. Center of dam should be 9 inches lower than the side elevation
- Side slopes: 2:1 or flatter
- Stone size: Use a mixture of 2 to 9 inch stone
- Width: Dams should span the width of the channel and extend up the sides of the banks
- Spacing: Space the dams so that the bottom (toe) of the upstream dam is at the elevation of the top (crest) of the downstream dam. This spacing is equal to the height of the check dam divided by the channel slope.
Spacing (in feet) = Height of check dam (in feet)/Slope in channel (ft/ft)

Maintenance:

Remove sediment accumulated behind the dam as needed to allow channel to drain through the stone check dam and prevent large flows from carrying sediment over the dam. If significant erosion occurs between check dams, a liner of stone should be installed.

7. Construct Permanent Controls

Purpose:

Permanent storm water treatment practices are constructed to maintain water quality, ensure groundwater flows, and prevent downstream flooding. Practices include detention ponds and wetlands, infiltration basins, and storm water filters.

Requirements:

If the total impervious* area on your site, or within the common plan of development, will be 1 or more acres, you must apply for a State Storm water Discharge Permit and construct permanent storm water treatment practices on your site. These practices must be installed before the construction of any impervious surfaces.

How to comply:

Contact the Vermont Storm water Program and follow the requirements in the Vermont Storm water Management Manual. The Storm water Management Manual is available at: www.vtwaterquality.org/stormwater.htm

*An impervious surface is a manmade surface, including, but not limited to, paved and unpaved roads, parking areas, roofs, driveways, and walkways, from which precipitation runs off rather than infiltrates.

8. Stabilize Exposed Soil

Purpose:

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

Requirements:

All areas of disturbance must have temporary or permanent stabilization within 7, 14, or 21 days of initial disturbance, as stated in the project authorization. After this time, any disturbance in the area must be stabilized at the end of each work day.

The following exceptions apply:

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

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

How to comply:

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

Seeding Rates for Temporary Stabilization

April 15 - Sept. 15 -- Ryegrass (annual or perennial): 20 lbs./acre
Sept. 15 - April 15 -- Winter rye: 120 lbs./acre

Seeding Rates for Final Stabilization: Choose

Choose from:	Market Variety	lbs./acre	lbs./1000 sq. ft.	
Birds-foot trefoil	Empire/Pardoc	51	0.1	
or	Common white clover	8	0.2	
plus	Tall Fescue	KY-31/Rebel	10	0.25
plus	Redtop	Common	2	
or	Ryegrass (perennial)	Pennfine/Linx	5	0.1

1- Mix 2.5 each of Empire and Pardoc OR 2.5 lbs. of Birds-foot and 2.5 lbs. white clover per acre

Mulching Rates

April 15 - Sept. 15 -- Hay or Straw: 1 inch deep (1-2 bales/1000 s.f.)
Sept. 15 - April 15 -- Hay or Straw: 2 in. deep (2-4 bales/1000 s.f.)

Erosion Control Matting

As per manufacturer's instructions

Hydroseed

As per manufacturer's instructions

9. Winter Stabilization

Purpose:

Managing construction sites to minimize erosion and prevent sediment loading of waters is a year-round challenge. In Vermont, this challenge becomes even greater during the late fall, winter, and early spring months.

'Winter construction' as discussed here, describes the period between October 15 and April 15, when erosion prevention and sediment control is significantly more difficult.

Rains in late fall, thaws throughout the winter, and spring melt and rains can produce significant flows over frozen and saturated ground, greatly increasing the potential for erosion.

Requirements for Winter Shutdown:

For those projects that will complete earth disturbance activities prior to the winter period (October 15), the following requirements must be adhered to:

- For areas to be stabilized by vegetation, seeding shall be completed no later than September 15 to ensure adequate growth and cover.
- If seeding is not completed by September 15, additional non-vegetative protection must be used to stabilize the site for the winter period. This includes use of Erosion Control Matting or netting of a heavy mulch layer. Seeding with winter rye is recommended to allow for early germination during wet spring conditions.
- Where mulch is specified, apply roughly 2 inches with an 80-90% cover. Mulch should be tracked in or stabilized with netting in open areas vulnerable to wind.

Requirements for Winter Construction

If construction activities involving earth disturbance continue past October 15 or begin before April 15, the following requirements must be adhered to:

- Enlarged access points, stabilized to provide for snow stockpiling.
- Limits of disturbance moved or replaced to reflect boundary of winter work.
- A snow management plan prepared with adequate storage and control of meltwater, requiring cleared snow to be stored down slope of all areas of disturbance and out of storm water treatment structures.
- A minimum 25 foot buffer shall be maintained from perimeter controls such as silt fence.
- In areas of disturbance that drain to a water body within 100 feet, two rows of silt fence must be installed along the contour.
- Drainage structures must be kept open and free of snow and ice dams.
- Silt fence and other practices requiring earth disturbance must be installed ahead of frozen ground.
- Mulch used for temporary stabilization must be applied at double the standard rate, or a minimum of 3 inches with an 80-90% cover.
- To ensure cover of disturbed soil in advance of a melt event, areas of disturbed soil must be stabilized at the end of each work day, with the following exceptions:
 - If no precipitation within 24 hours is forecast and work will resume in the same disturbed area within 24 hours, daily stabilization is not necessary.
 - Disturbed areas that collect and retain runoff, such as house foundations or open utility trenches.
- Prior to stabilization, snow or ice must be removed to less than 1 inch thickness.
- Use stone to stabilize areas such as the perimeter of buildings under construction or where construction vehicle traffic is anticipated. Stone paths should be 10 to 20 feet wide to accommodate vehicular traffic.

10. Stabilize Soil at Final Grade

Purpose:

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

Requirements:

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

How to comply:

Bring the site or sections of the site to final grade as soon as possible after construction is completed. This will reduce the need for additional sediment and erosion control measures and will reduce the total disturbed area. For seeding and mulching rates, follow the specifications under Rule 8, Stabilizing Exposed Soil.

11. Dewatering Activities

Purpose:

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

Requirements:

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

How to comply:

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

12. Inspect Your Site

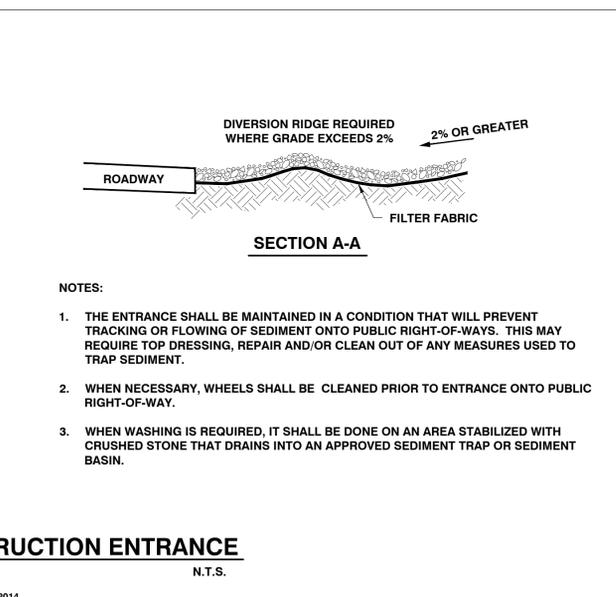
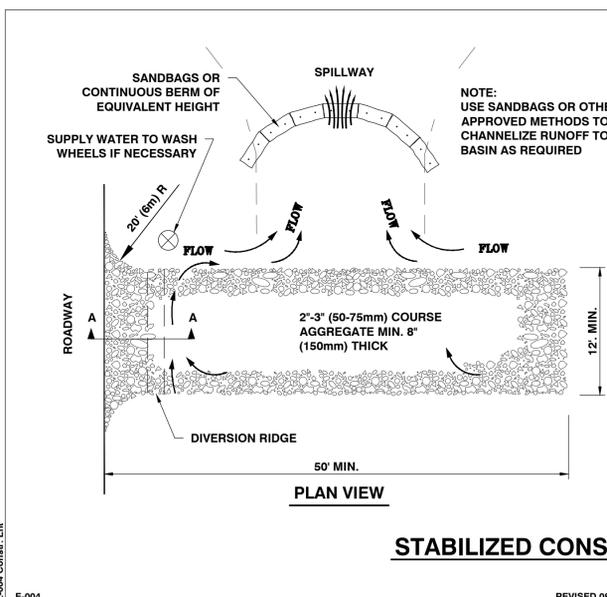
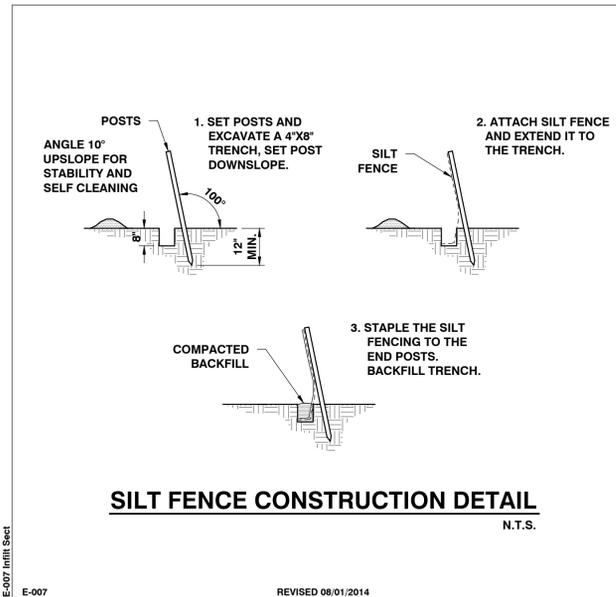
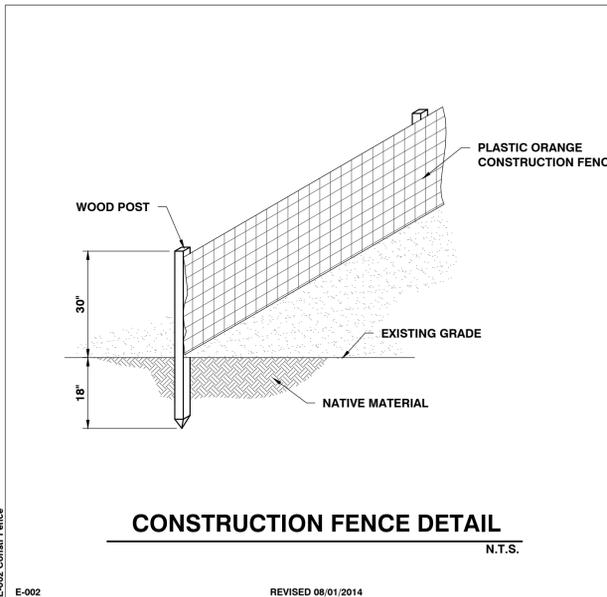
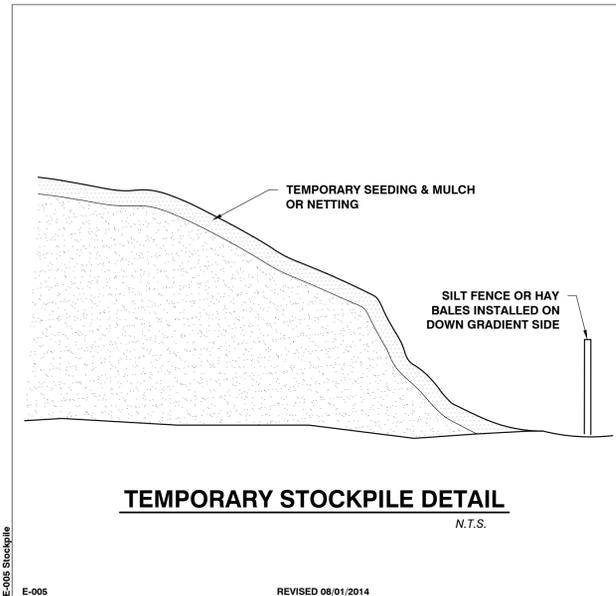
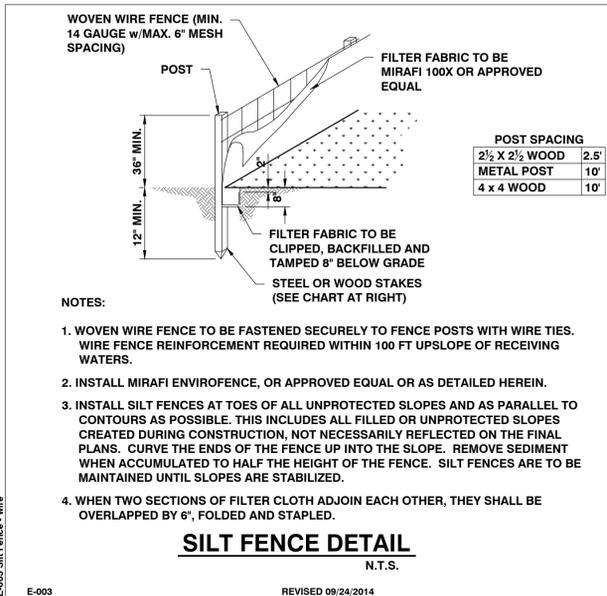
Purpose:

Perform site inspections to ensure that all sediment and erosion control practices are functioning properly. Regular inspections and maintenance of practices will help to reduce costs and protect water quality.

Requirements:

Inspect the site at least once every 7 days and after every rainfall or snow melt that results in a discharge from the site. Perform maintenance to ensure that practices are functioning according to the specifications outlined in this handbook.

In the event of a noticeable sediment discharge from the construction site, you must take immediate action to inspect and maintain existing erosion prevention and sediment control practices. Any visibly discolored storm water runoff to waters of the State must be reported. Forms for reporting discharges are available at: www.vtwaterquality.org/stormwater.htm



SITE ENGINEER:



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

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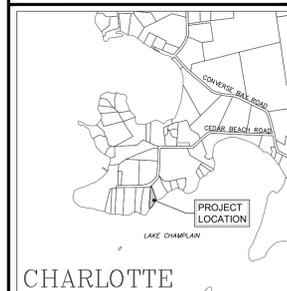
CLIENT:

ESTATE OF SHIRLEY
L. BRUCE

PROJECT:

WASTEWATER
SYSTEM

715 CEDAR BEACH ROAD
CHARLOTTE, VT 05445



LOCATION MAP

1" = 2000'

DATE	CHECKED	REVISION

EROSION
CONTROL NOTES
AND DETAILS

DATE

8/31/20

SCALE

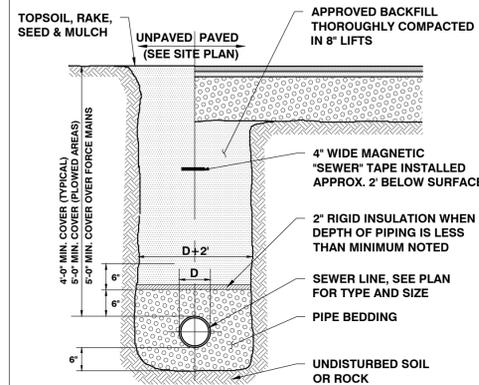
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PROJ. NO.

18198

DRAWING NUMBER

C2.0



- NOTES:**
1. COMPACTION OF BACKFILL AND BEDDING SHALL BE A MINIMUM OF 90% (98% UNDER ROADWAY SURFACES) OF MAXIMUM DRY DENSITY DETERMINED IN THE STANDARD PROCTOR TEST (ASTM D698).
 2. BEDDING MATERIAL SHALL NOT BE PLACED ON FROZEN SUBGRADE.
 3. APPROVED BACKFILL SHALL NOT CONTAIN ANY STONES MORE THAN 12" IN LARGEST DIMENSION (6" IN ROADWAYS, 1 1/2" MAXIMUM DIAMETER WITHIN 24" OF THE OUTSIDE OF THE PIPE), OR CONTAIN ANY FROZEN, WET, OR ORGANIC MATERIAL.
 4. TRENCHES SHALL BE COMPLETELY DEWATERED PRIOR TO PLACING OF PIPE BEDDING MATERIAL AND KEPT DEWATERED DURING INSTALLATION OF PIPE AND BACKFILL.
 5. IN TRENCHES WITH UNSTABLE MATERIALS OR HIGH WATER TABLE, TRENCH BOTTOM SHALL FIRST BE STABILIZED BY PLACEMENT OF FILTER FABRIC THEN CRUSHED STONE (3/4" MAXIMUM).
 6. THE SIDES OF TRENCHES 4' OR MORE IN DEPTH ENTERED BY PERSONNEL SHALL BE SHEETED OR SLOPED TO THE ANGLE OF REPOSE AS DEFINED BY O.S.H.A. STANDARDS.
 7. BEDDING MATERIAL FOR WASTEWATER LINES SHALL CONSIST OF CRUSHED STONE, GRAVEL, OR SAND WITH A MAXIMUM SIZE OF 3/4". SUBMIT A SAMPLE TO THE ENGINEER FOR APPROVAL.
 8. ALL JOINTS TO BE INSPECTED BY OWNER/ENGINEER/TOWN PRIOR TO BACKFILL.

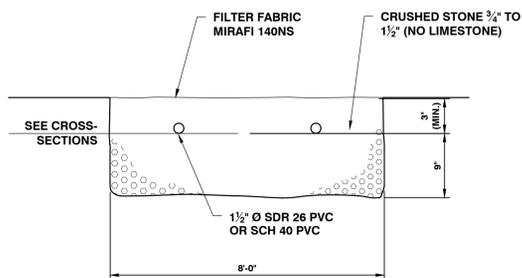
TYPICAL SEWER TRENCH DETAIL

N.T.S.

SWR-001 Trench

SWR-001

REVISED 12/08/2016



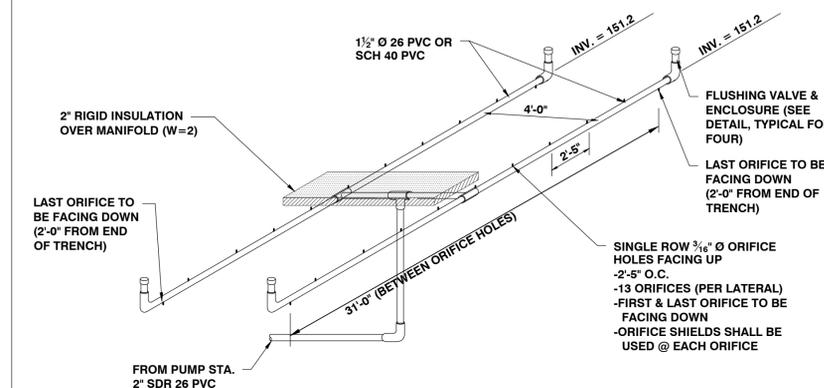
TYPICAL DISPOSAL FIELD TRENCH SECTION

N.T.S.

SWR-014 Disposal Trench

SWR-014

REVISED 10/31/2014

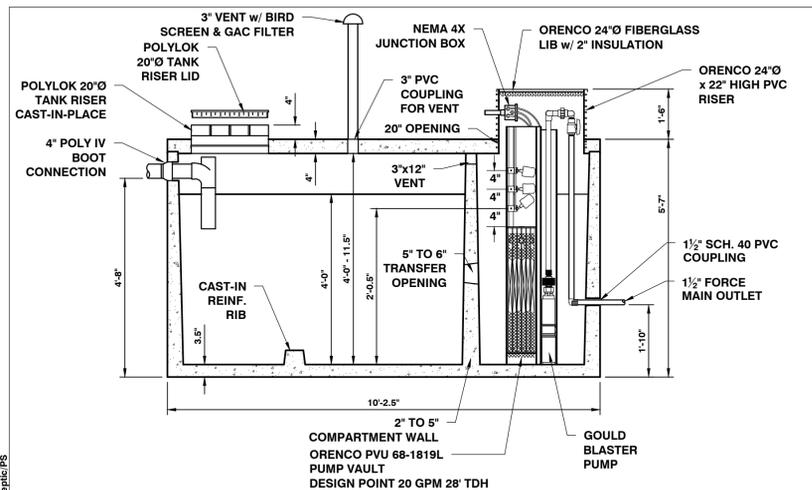


TRENCH PIPING DETAIL

N.T.S.

DET-022 Trench Piping

REVISED 7/10/2018



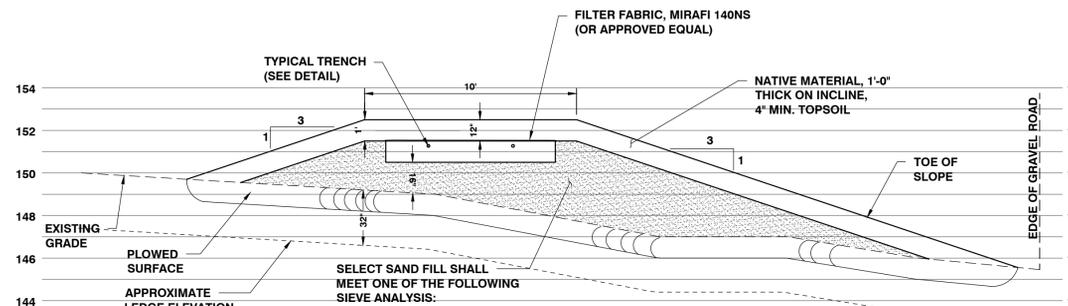
1,500 GALLON COMBINED SEPTIC TANK/PUMP STATION FOR 3 BEDROOM HOMES

N.T.S.

SWR-017 1500 Comb. Septic/PS

SWR-017

REVISED 10/17/2014



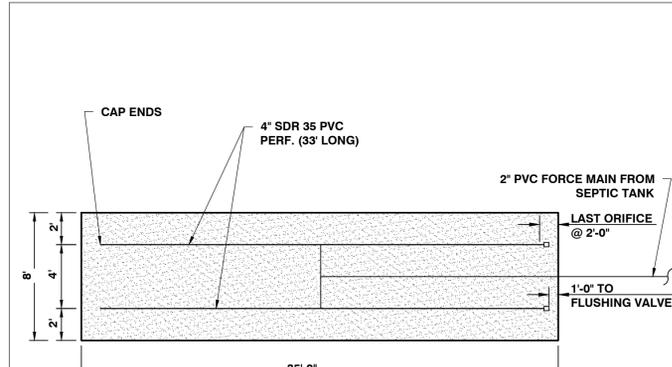
TYPICAL MOUND SECTION

1/4" = 1'-0"

SWR-024 Typical Mound Section

SWR-024

REVISED 10/31/2014



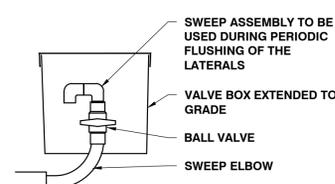
TYPICAL TRENCH PLAN

N.T.S.

SWR-023 Typical Trench

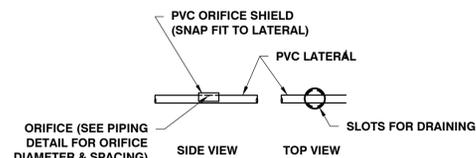
SWR-023

REVISED 10/31/2014



FLUSHING VALVE DETAIL

N.T.S.



ORIFICE SHIELD DETAIL

N.T.S.

SWR-013 Orifice/Flush Valve

SWR-013

REVISED 10/17/2014

SITE ENGINEER:



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

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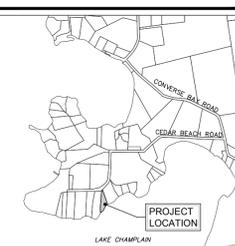
CLIENT:

ESTATE OF SHIRLEY L. BRUCE

PROJECT:

WASTEWATER SYSTEM

715 CEDAR BEACH ROAD
CHARLOTTE, VT 05445



CHARLOTTE

LOCATION MAP

1" = 2000'

DATE CHECKED REVISION

DATE	CHECKED	REVISION

DETAILS

DATE

8/31/20

SCALE

AS SHOWN

PROJ. NO.

18198

DRAWING NUMBER

C2.1

DISPOSAL FIELDS (SYSTEM C)

- A. Materials**
- Schedule 40 PVC pipe meeting the requirements of the latest revision of ASTM Specification D-1785 shall be used. Fittings used in the disposal fields shall be compatible with distribution lines material.
 - Crushed stone shall be clean, durable and no smaller than 3/4 or larger than 1 1/2 inches in diameter.
- B. Installation**
- The wastewater system shall be inspected during critical stages of construction by a qualified consultant. This shall include at a minimum the staking of the disposal field, the trenches after the initial 12" of stone and distribution piping is placed and a final inspection of the entire system. The Contractor will be responsible for contacting the Engineer to set up the inspection schedule.
 - The distribution box shall be installed level and arranged so that effluent is evenly distributed to each distribution line. Adequate provisions shall be taken to assure stability and provide access for inspection of the distribution box.
 - The pipe connection the distribution box to the distribution line shall be of tight joint construction laid on undisturbed soil or properly bedded throughout its length.
 - When cover over the sewer lines to the distribution box is less than 4 feet, install 2" rigid insulation over pipe.
 - When the trenches have been excavated, the sides and bottom shall be raked to scarify any smeared soil surfaces. Construction equipment not needed to construct the system should be kept off the area to be utilized for the absorption trench system to prevent undesirable compaction of the soils. Construction shall not be initiated when the soils moisture content is high.
 - At least 12" of crushed stone shall be placed in the bottom of the trench.
 - The distribution line shall then be carefully placed on the bedding with no slope, holes facing downward, and covered with at least 2" of crushed stone. Prior to covering, the distribution network should be tested with water for even distribution.
 - All work shall be done in accordance with the State of Vermont Environmental Protection Rules.

SWR-106 REVISED 10/17/2016

PUMP STATION / SEPTIC TANK TESTING

The tanks shall be tested by the following procedure and in conformance with the State of Vermont - Environmental Protection Rules:

- Exfiltration Leakage Test:** All pipes and other openings into the tank shall be suitably plugged and the plugs braced to prevent blowout. The tank shall then be filled with water to the top of the riser section. A period of time may be permitted, if the Contractor so wishes, to allow for absorption. At the end of this period, the tank shall be refilled to the top of the riser, if necessary, and the measuring time of at least four hours begun. At the end of the test period, the tank shall be refilled to the top of the riser, measuring the volume of water added. This amount shall be converted to gallons per vertical foot depth for 24 hours. The leakage for each tank shall not exceed four gallon/vertical foot/day. If leakage exceeds the allowable rate, repairs shall be made as approved by the Engineer and the tank retested. If the Contractor elects to backfill prior to testing, the testing shall be at his own risk, and it shall be incumbent upon the Contractor to determine the reason for any failure of the test. No adjustment in the leakage allowance will be made for unknown causes such as leaking plugs, absorption, etc. It will be assumed that all loss of water during the test is a result of leaks through the joints or through the concrete. Furthermore, the Contractor shall take any steps necessary to assure the Engineer that the water table is below the bottom of the tank throughout the test.

OR

- Vacuum test in accordance with ASTM C1227-03, Standard Specification for Precast Concrete Septic Tanks, except as noted below:**

- seal the empty tank and apply a vacuum to 5 inches (100mm) of mercury. The tank is approved if 90% of vacuum is held for 5 minutes.

SWR-105 Tank Testing Notes

SWR-105

	Horizontal Distance (Feet)		
	Leach field	Septic Tank	Sewer
Drilled Well Serving 1 Home - Up Slope of Disposal Field	100 (Min.) ¹	50	50
Drilled Well Serving 1 Home - Down Slope of Disposal Field	200 (Min.)	50	50
Shallow Well or Spring, Up Slope of Disposal Field	150 (Min.)	75	75
Shallow Well or Spring, Down Slope of Disposal Field	500 (Min.) ¹	75	75
Lakes, Ponds and Impoundment	50	25	25
Rivers, Streams	50	25	10
Drainage Swales, Roadway Ditches	25	-	-
Municipal Water Main	50	50	10
Service Water Lines	25	25	10
Roadways, Driveways, Buildings	10	5	5
Top of embankment or slope > 30%	25	10	-
Property Line	10 (25 Downslope) ²	10	10
Trees	10	10	10
Replacement Area	10	-	-
Foundation, Footing Drains	35 (75 Downslope) ³	10	-

- Isolation distances to well locations may vary due to site conditions - contact Engineer for verification with the Vermont Water Supply Rule Regulations.
- For mound disposal systems, the limit of mound fill must be 25 feet from any downhill property line and 10 feet from side or uphill property lines.
- If a curtain or foundation drain is downslope of the leach field, the leach field cannot be closer than 75 feet to the drain. If the drain is upslope of the leach field, it shall be 35' if possible and 20' minimum.
- Sewers under roads, driveways or parking lots may require protective conduits or sleeves.

MINIMUM ISOLATION DISTANCES

(CONTACT ENGINEER FOR ANY CLARIFICATIONS OR CONFLICTS)

SWR-100 Sewer Iso

SWR-100

REVISED 08/01/2014

DISPOSAL FIELDS & FORCE MAINS

PART 1 - GENERAL

1.01 Summary

- A. Section includes:**
- Wastewater Disposal Field
 - Force Main Materials

1.02 References

- A.** All work shall be done in accordance with the State of Vermont Environmental Protection Rules effective September 29, 2007.

PART 2 - PRODUCTS

2.01 General

- A. Disposal Fields:** Schedule 40 PVC pipe meeting the requirements of the latest revision of ASTM Specification D-1785. Fittings used in the disposal fields shall be compatible with distribution lines material.
- B. Force Mains:** PVC pipe shall conform in all respects to the latest revisions of ASTM Specifications D-2241. All pipe fittings shall be SDR 26 (or SCH 40) clearly marked as follows:
- Manufacturer's Name and Trademark
 - Nominal Pipe Size (as shown on plans)
 - Material Designation
- Joints shall be push-on type using elastomeric gaskets factory installed conforming to ASTM Specification D-3212.

- C.** Crushed stone shall be clean, durable and no smaller than 3/4" or larger than 1 1/2 inches in diameter.

PART 3 - EXECUTION

3.01 Disposal Field Installation Procedure

- A.** The wastewater system shall be inspected during critical stages of construction by a qualified consultant. This shall include at a minimum the staking of the disposal field, the trenches after the initial 12 inches of stone and distribution piping is placed, and a final inspection of the entire system. The Contractor will be responsible for contacting the Engineer to set up the inspection schedule.

- B.** Construction of the system shall not take place when the soil moisture is high in the system area. If the soil at 6 inches below grade can be rolled into the shape of a wire, the soil moisture content is too high for construction to begin.

- C.** When the trench has been excavated, the sides and bottom shall be raked to scarify any smeared soil surfaces. Construction equipment not needed to construct the system should be kept off the area to be utilized for the absorption trench system to prevent undesirable compaction of the soils.

- D.** At least 12 inches of washed stone shall be placed in the bottom of the trench.

- E.** The pressure distribution pipe should be laid level on top of the stone and flushing valves installed at the ends of the pipe. Upon completion of the distribution piping, the qualified consultant shall test the system with clean water. The test shall show that a minimum pressure of three feet of head is present at the ends of the pipe and that the difference in discharge rate between the two orifices with the greatest difference in discharge rates is not greater than 15 percent. After connecting the distribution pipe to the force main, the distribution pipe shall be covered with at least two inches of clean stone aggregate. The stone aggregate shall be covered completely with filter fabric.

- F.** The distribution pipe shall be covered with at least 3 inches of clean stone aggregate. The stone aggregate shall be covered completely with filter fabric.

- G.** The filter fabric shall be covered with a minimum of 12 inches of soil but not more than 18 inches, with the upper 4 to 6 inches of soil being loam and the remainder of the fill being of a fine sandy loam to medium sand texture. A vegetated cover free of large brush and trees shall be maintained over the system.

- H.** The area surrounding the disposal field shall be graded to provide diversion of surface run-off waters if required.

3.02 Testing Report

- A.** Testing of pressure distribution shall be done in the Engineer's presence. Pressure shall be measured to insure a minimum of 1 psi.

- B.** The distribution line shall then be carefully placed on the bedding with no slope, orifice shields snapped into place, and covered with at least 2" of crushed stone.

- C.** All work shall be done in accordance with the State of Vermont Environmental Protection Rules.

D. Force Main

- 1. General:** All force mains shall pass the hydrostatic pressure test and leakage test described herein. Prior to testing, all anchors and braces shall be installed. All concrete thrust blocks and restraints shall be in place and cured at least seven days. All buried pipe shall be backfilled. Suitable test plugs shall be installed and air release valves shall be installed at the high points.

- 2. Hydrostatic Test:** The following procedure shall be used:

- All air release valves shall be opened and the pipe shall be filled with water at a rate not to exceed the venting capacity of the air release valves.
- The water pressure shall be raised to 150 percent of the designed operating pressure or 60 psi minimum at the highest point.
- Failure to hold the designated pressure within 5 psi of the specified test pressure for the two hour period constitutes a failure of the section tested.

- 3. Leakage Test:** The following procedure shall be used:

- Leakage shall be defined as the quantity of water that must be supplied into the pipe being tested to maintain pressure within 5 psi of the specified test pressure.
 - No pipe installation shall be accepted if the leakage is greater than that determined by the following formula:
- $$L = \frac{ND(P)0.5}{7,400}$$
- Which ever is less
- $$L = \frac{SD(P)0.5}{133,100}$$
- S = Length of Pipe Testing
L = Allowable Leakage in Gal/Hr
D = Nominal Diameter of Pipe (")
P = Average Test Pressure (psi)
N = Number of Joints in the Pipeline Tested

All testing shall be conducted in accordance with AWWA C600-87 or latest revision.

- E.** Prior to use of the system, the qualified consultant shall submit a written report to the Owner stating that the system has been installed according to the approved plans and permit. The report shall specifically address the inspection of the site preparations and include numerical results of the orifice discharge rate comparison.

SITE ENGINEER:



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

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DRAWN

MAB

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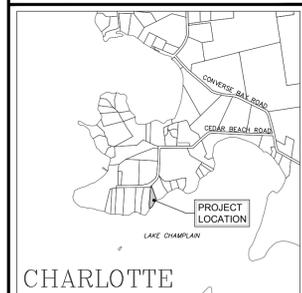
CLIENT:

**ESTATE OF SHIRLEY
L. BRUCE**

PROJECT:

**WASTEWATER
SYSTEM**

**715 CEDAR BEACH ROAD
CHARLOTTE, VT 05445**



CHARLOTTE

LOCATION MAP

1" = 2000'

DATE	CHECKED	REVISION

DETAILS

DATE
8/31/20
SCALE
AS SHOWN
PROJ. NO.
18198

DRAWING NUMBER
C2.2

SANITARY SEWER SYSTEMS

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes:
 1. Gravity Sewer Pipe
 2. Pressure Sewer Pipe

B. Related Sections:

- 1. Section 312000 Earth Moving

1.02 SUBMITTALS

- A. Product Data: Submit published data from manufacturers of products and accessories specified, indicating compliance with requirements.

1.03 QUALITY ASSURANCE

- A. All sanitary sewer materials and construction of same shall be as shown on the Contract Plans and shall meet the requirements of the State of Vermont Agency of Natural Resources (Department of Environmental Conservation) and the Public Works Standards and Specifications of the local municipality.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Furnish elts, tees, reducing tees, wyes, couplings, increasers, crosses, transitions and end caps of the same type and class of material as the conduit, or of material having equal or superior physical and chemical properties as acceptable to the Engineer to provide a complete and operable system.

2.02 PVC GRAVITY SANITARY SEWER PIPE

- A. PVC sewer pipe shall conform in all respects to the latest revision of ASTM Specifications D-3034 or F679, Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings, SDR 35 pipe. All pipe and fittings shall be clearly marked as follows:

- Manufacturer's Name and Trademark
- Nominal Pipe Size (as shown on plans)
- Material Designation 12454-C PVC
- Legend "Type PSM SDR 35 PVC Sewer Pipe" or "PS 46 PVC Sewer Pipe"
- Designation ASTM D-3034 or F679

- B. Joints shall be push-on type using elastomeric gaskets and shall conform to ASTM D-3212. The gaskets shall be factory installed. The pipe shall be furnished in nominal 13 foot lengths. Sufficient numbers of short lengths and full machine fittings shall be provided for use at manholes and connections. All connections will require the use of manufactured fittings. Field fabricated, saddle-type connections will not be considered acceptable.

- C. Any pipe or fitting having a crack or other defect or which has received a severe blow shall be marked rejected and removed at once from the work site. All field cuts are to be made with saw and 90 degree miter box. Bevel the cut end to the same as the factory bevel and remove all interior burrs. Measure and place a haming mark on the pipe before assembling. The pipe installed under this specification shall be installed so that the initial deflection, measured as described below, shall be less than five percent (5%).

- D. The manhole water stop gasket and stainless steel clamp assembly must be approved by the Town Wastewater Treatment Department prior to the installation of any pipe.

- E. The Contractor will submit certification that the materials of construction have been sampled, tested, inspected, and meet all the requirements including wall thickness in accordance with ASTM D-3034 or ASTM F679 for all pipe and fittings to be installed in project work. PVC pipe shall not be installed when the temperature drops below 32 degrees Fahrenheit or goes above 100 degrees Fahrenheit. During cold weather, the flexibility and impact resistance of PVC pipe is reduced. Extra care is required when handling PVC pipe during cold weather. PVC pipe shall not be stored outside and exposed to prolonged periods of sunlight, as pipe discoloration and reduction in pipe impact strength will occur. Canvas and other opaque material shall be used to cover PVC pipe when stored outside.

2.03 PVC PRESSURE SEWER PIPE

- A. PVC pipe shall conform in all respects to the latest revisions of ASTM Specifications D-2241. All pipe and fittings shall be SDR 26 (or as specified on plans) clearly marked as follows:

- Manufacturer's Name and Trademark
- Nominal Pipe Size (as shown on plans)
- Material Designation 12454-A PVC ASTM D-1784

- B. Joints shall be push-on type using elastomeric gaskets factory installed conforming to ASTM Specification D-3212.

2.04 CLEANOUTS

- A. Cleanouts for gravity sewers and force mains shall be provided at locations indicated on the plans or as directed by the Engineer. Cleanout frames and covers shall be of tough gray cast iron. Castings shall be true to pattern and free from flaws. The bearing surface of cleanout frames and covers against each other shall be machined to give continuous contact throughout their circumference.

2.05 PIPELINE INSULATION

- A. Approved sewer lines with less than four feet (4'-0") of cover over the crown, five (5'-0") in plowed areas that cross a storm sewer, or where indicated on the plans, shall be protected against freezing by the installation of two inch (2") thick highest available density extruded polystyrene insulating sheets or equivalent. Sheets shall be the the lesser of 3' or 2 x diameter of the pipe. The sheets shall be placed

six inches (6") above the crown after placement of four to six inches (4"-6") of clean medium or coarse sand below the pipe bottom and four to six inches (4"-6") above the crown. Joints shall be overlapped so there is no gap that will allow frost to penetrate. Care shall be exercised during backfill and compaction over the polystyrene sheets to prevent damage to the sheets. The polystyrene sheets shall meet the comprehensive strength requirements of ASTM D1621-73. In no cases shall the waterline have less than four feet (4') of cover over the top of the pipe. When sewer line passes within 5 feet of a catch basin install 2" min. rigid insulation, polystyrene sheets, between sewer line and cb.

PART 3 – EXECUTION

3.01 GENERAL

- A. Care shall be exercised by the Contractor to avoid disrupting the operation of existing sanitary sewer facilities without prior written approval of the Engineer.

- B. When existing underground utilities not scheduled for removal or abandonment are encountered in the excavation, they shall be adequately supported and protected from damage. Any damage to utilities shall be repaired promptly at no additional cost to the Owner.

- C. Installation of pipe shall be in accordance with the Utility Trenching and Backfilling and as specified by this section.

3.02 BEDDING FOR PIPE

- A. The bedding material shall be shaped to fit the pipe for a depth of not less than 10 percent of its total height and shall have recesses to receive the bell.

3.03 LAYING PIPE

- A. In general, sewer pipe shall be installed in accordance with the latest detailed instructions of the manufacturer.

- B. The laying shall begin at the outlet end and the lower segment of the pipe shall be in contact with the shaped bedding throughout its full length. Bell or grooved ends of rigid pipes and the circumferential lops of flexible pipe shall be placed facing upstream.

- C. All pipe and fittings shall be carefully examined for defects and no pipe or fittings shall be laid which are known to be defective. If any defective piece is discovered after laying, it shall be removed and replaced at the Contractor's expense. All pipes and fittings shall be cleaned before they are laid and shall be kept clean until accepted in the completed work.

- D. The pipe shall be laid to conform to the lines and grades indicated on the drawings or given by the Engineer. Each pipe shall be so laid as to form a close joint with the next adjoining pipe and to bring the inverts continuously to the required grade.

- E. The Contractor shall take all necessary precautions to prevent flotation of the pipe in the trench.

- F. When pipe laying is not in progress, the open ends of the pipe shall be closed with temporary watertight plugs. If water is in the trench when work is resumed, the plug shall not be removed until all danger of water entering the pipe is eliminated.

- G. For force mains, concrete reaction blocking shall be provided as detailed at all bends deflecting 22½ degrees or more. At the Contractor's option, retainer glands may be used at bends in lieu of concrete blocking. Retainer glands shall also be provided at all joints within three pipe lengths each side of the bends.

- H. Any pipe that is not laid to grade and alignment shall be re-laid to the satisfaction of the Town Wastewater Department. The bedding material shall be placed and compacted on each side of the pipe to a height equal to one-half (1/2) the pipe diameter and for the full width of the excavated trench and as shown on the accepted plans. Bedding shall be #2 pea stone from Shelburne Limestone or an equivalent approved by the Town Wastewater Department and the Engineer.

3.04 GRAVITY SEWER PIPE TESTING

- A. The Contractor shall provide all necessary equipment and instrumentation required for proper completion of the flushing and testing. Quality of water, test procedures, and method of disposal of water shall be approved by the Engineer. Prior to testing, flush with water to remove construction debris and pass through a full gouge squeegee.
- B. All tests shall be made in the presence of the Engineer. Preliminary tests made by the Contractor without being observed by the Engineer will not be accepted. The Engineer will be notified at least eight hours before any work is to be inspected or tested. The Town shall be notified at least at least two (2) days before testing.
- C. The maximum sewer length to be tested at one time shall be that length between any two manholes.
- D. Air Testing: Low pressure air testing shall be conducted in accordance with the following procedures:

1. Each end of the test section and laterals shall be plugged, capped and braced. Necessary safety precautions shall be taken to prevent blowouts and possible injury.
2. An air hose shall be connected to a tapped plug used for an air inlet. The hose will be connected to the air control equipment, which shall include valves and pressure gauges. These shall allow air to enter the sewer test line, monitor air pressure in the sewer, shut off air, and provide pressure reduction and relief. The monitoring pressure gauge shall have a range of 0-10 psi with divisions of 0.10 psi and accuracy of 0.05 psi±.

3. The air compressor and air supply shall be connected to the test line and the test section filled slowly, until a constant pressure of 4.0 psig is maintained.
4. A pressure above 3.0 psig shall be maintained for at least five minutes to allow the temperature to stabilize. A check for leaks shall be made and if any are found, the pressure shall be released and the fitting replaced or repaired.
5. After the stabilization period, the pressure shall be adjusted to 3.5 psig and the air supply disconnected.

6. Measure and record the time interval for the test line pressure to drop from 3.5 psig to 2.5 psig.
7. If the groundwater table is above the pipe, increase above test pressures 0.5 psig for each foot the groundwater is above the invert of the pipe.
8. The requirements of this specification shall be considered satisfied if the time required in seconds for the pressure to decrease from 3.5 to 2.5 psi greater than the average back pressure of any groundwater that may submerge the pipe is not less than that computed according to the following table:

Minimum Diameter (Inches)	Test Time for Various Pipe Sizes (Sec./100 Ft.)
4	18
6	45
8	75
10	90
12	110

3.05 PRESSURE PIPE TESTING

- A. General: All force mains shall pass the hydrostatic pressure test and leakage test described herein. Prior to testing, all anchors and braces shall be installed. All concrete thrust blocks and restraints shall be in place and cured at least seven days. All buried pipe shall be backfilled. Suitable test plugs shall be installed and air release valves shall be installed at the high points.

- B. Hydrostatic Test: The following procedure shall be used:

1. All air release valves shall be opened and the pipe shall be filled with water at a rate not to exceed the venting capacity of the air release valves.
2. The water pressure shall be raised to 150 percent of the designed operating pressure or 60 psi minimum at the highest point.
3. Failure to hold the designated pressure within 5 psi of the specified test pressure for the two hour period constitutes a failure of the section tested.

- C. Leakage Test: The following procedure shall be used:

1. Leakage shall be defined as the quantity of water that must be supplied into the pipe being tested to maintain pressure within 5 psi of the specified test pressure.
2. No pipe installation shall be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{ND(P)^{0.5}}{7,400}$$

Whichever is less

$$L = \frac{SD(P)^{0.5}}{133,100}$$

- S = Length of Pipe Testing
- L = Allowable Leakage in Gal/Hr.
- D = Nominal Diameter of Pipe (")
- P = Average Test Pressure (psi)
- N = Number of Joints in the Pipeline Tested

- All testing shall be conducted in accordance with AWWA C600-87 or latest revision.

3.06 PUMP STATION AND STORAGE TANK TESTING

- A. Pump Station and Storage Tank Testing: All manholes and storage tanks shall be tested for leakage in accordance with the following procedure:

- B. Water Test: After the structure has been assembled in place, all lifting holes and exterior joints shall be filled and pointed with non shrinking mortar. All pipes and other openings into the structure shall be suitably plugged and the plugs placed to prevent blowout.

1. Each structure shall be checked for exfiltration by filling with water to the top of the cone section. A stabilization period of one hour shall be provided to allow for absorption. At the end of this period, the structure shall be refilled to the top of the cone, if necessary, and the measuring time of at least six hours begun. At the end of the test period, the structure shall be refilled to the top of the cone measuring the volume of water added.
2. This amount shall be converted to a 24-hour rate and the leakage determined on the basis of depth and size of structure. The leakage for each structure shall not exceed one gallon per vertical foot per 15 linear feet of wall (as measured in plan view) for a 24 hour period for exfiltration and there shall be no visible infiltration.

- C. Air Test: Alternatively, the manhole may be tested for leakage using the following procedure:

1. All lifting hole and exterior joints shall be filled and pointed with an approved non-shrinking mortar. The completed manhole shall not be backfilled prior to testing. Structures that have been backfilled shall be excavated to expose the entire exterior prior to vacuum testing or the manhole shall be tested for leakage by means of a hydrostatic test.
2. All pipes and other openings in the manhole shall be suitably plugged in a manner to prevent displacement.
3. A plate with an inflatable rubber ring the size of the top of the manhole shall be installed by inflating the ring with air to a pressure adequate to prevent leakage of air

between the rubber ring and the manhole wall.

4. Air shall then be pumped out of the manhole through an opening in the plate until a vacuum is created inside of the manhole equal to 10 inches of mercury on an approved vacuum gauge. The removal of the air shall then be stopped and the test time begun.
5. The vacuum must not drop below 9 inches of mercury within a 2 minute test period. If more than 1 inch of drop in vacuum occurs within the 2 minute test period the manhole has failed the test and shall be repaired or reconstructed and retested.

- D. Following satisfactory test results, the manhole may be backfilled.

3.07 SERVICE CONNECTION

No sanitary sewer shall be placed in service until such time as the Town has given final approval to the sewer installation, including satisfactory completion of all required tests. Service connections shall not be made until all receiving sewer mains have been completed and approved and as-builts received along with GPS coordinates and approved by the Town Wastewater Department.

A. Laterals

Where required on the plans, sewer service connections for one house shall be constructed of four inch (4") pipe, unless otherwise noted on the plans, of the type material specified under this section. The pipe shall be laid and its joints made as required for sewer construction in this specification. Open ends of pipes shall be properly sealed to prevent damage and intrusion of foreign matter where hookup to the building sewer is not coincident with sewer main construction. Additionally, the Contractor will provide a stable, temporary marker approved by the Town Wastewater Department from the sewer service invert up to six inches (6") above the finish grade and seated securely into the ground for ease in relocating the end of sewer service connection for hooking up the building sewer. Two (2) tie points to permanent objects shall be documented. The tie points shall be submitted to the homeowner and to the Wastewater Department.

In the case of reconnection of existing services, such reconnection will be made only after the new sewer main has been completed, tested, and accepted. The excavation, bedding material, installation, and backfill for service connections shall be the same as for sewer mains.

B. Cleanouts for Sewers

Cleanouts for gravity sewers and force mains shall be provided at locations indicated on the plans or as directed by the Town Wastewater Department. Cleanout frames and covers against each other shall be machined to give continuous contact throughout their circumference. All iron castings shall be thoroughly cleaned and then coated with hot coal tar before being delivered. Individual laterals shall have cleanouts every one hundred feet (100'). Cleanouts shall also be installed in laterals with changes of alignment of 45 degrees or greater.

C. Chimneys

Chimneys shall be built of four inch (4") pipe and/or as indicated on the contract drawings. Each chimney shall be plugged or capped at end until ready to connect to existing services. Chimneys are required where the vertical drop between the finished grade surface and the main sewer line exceeds fifteen feet (15') at the wye from a service connection.

3.08 Force Main

After force mains have been laid and the trench backfilled, the pipe shall be subjected to a hydrostatic pressure test in accordance with AWWA Standard for Installation of Cast Iron Water Main, AWWA C600 (latest issue), Section 13. The hydrostatic pressure shall be 150 percent (150%) of normal operational pressure. After the pressure test has been satisfactorily completed, a leakage test shall be conducted in accordance with AWWA C600 (latest issue), Section 13. The minimum test pressure shall be 75 pounds per square inch at the high point in the system.

3.09 Wet well

The pre-cast concrete wet well shall be externally coated with an asphaltic sealant and tested for water tightness using an approved vacuum or water testing procedure.

PART 4 – PUMP STATION

4.00 O & M MANUALS

- A. Installation of all mechanical equipment shall be done in accordance with written instructions provided by the manufacturer. Installation instructions shall be delivered with the station.
- B. The manufacturer shall provide 2 copies of a complete and detailed operating and maintenance manual. This manual shall provide all design criteria, general operating procedures, maintenance and servicing procedures for all major components, and as-built drawings of the contributory gravity sewer system, the pumping station and force main. All instructions and parts lists shall be prepared for the specific equipment furnished and shall not refer to similar equipment. Operating manuals must be submitted to the Town prior to final acceptance of the station.

4.01 POLYETHYLENE (PE3408) SANITARY SEWER FORCE MAINS

- A. This specification covers requirements for PE3408 high density polyethylene sanitary sewer force mains. All work shall be performed in accordance with these specifications and manufacturer requirements.
- B. Referenced Standards. All standard specifications, i.e., Federal, ANSI, ASTM, etc., made a portion of these Specifications by reference, shall be the latest edition and revision thereof.
- C. Warranty and Acceptance. The Contractor shall warrant all work to be free from defects in workmanship and materials for a period of one year from the date of completion of all construction. If work meets these specifications, a letter of acceptance, subject to the one year warranty period, shall be given at the time of completion. A final acceptance letter shall be given upon final inspection at the end of the one year warranty period, provided the work still complies with these specifications. In the event deficiencies are discovered

during the warranty period, they shall be corrected by the Contractor without additional charge to the owner before final acceptance. During the warranty period, the Project Engineer shall determine if warranty repairs or replacement work shall be performed by the Contractor. The decision of the Project Engineer shall be binding upon the Contractor.

D. Polyethylene Pipe and Fittings

1. Qualification of Manufacturers. The Manufacturer shall have manufacturing and quality control facilities capable of producing and assuring the quality of the pipe and fittings required by these Specifications. The manufacturer's production facilities shall be open for inspection by the Owner or his Authorized Representative. Qualified manufacturers shall be approved by the Project Engineer.
2. Materials. Materials used for the manufacture of polyethylene pipe and fittings shall be PE3408 high density polyethylene (SDR 11 or better) meeting cell classification 345444C or 345444E per ASTM D 3350; and shall be listed in the name of the pipe and fitting manufacturer in Plastics Pipe Institute's TR-4, Recommended Hydrostatic Strengths and Design Stresses for Thermoplastic Pipe and Fitting.

- 3. Compounds. with a standard grade HDB rating of 1,600 psi at 73F. The manufacturer shall certify that the materials used to manufacture pipe and fittings meet these requirements.

- 3. Polyethylene Pipe. Polyethylene pipe shall be manufactured in accordance with ASTM F 714, Polyethylene (PE) Plastic Pipe (SDR-11 rating or better) Based on Outside Diameter, and shall be so marked. Each production lot of pipe shall be tested for (from material or pipe) melt index, density, % carbon, (from pipe) dimensions and ring tensile strength.

- 4. Polyethylene Fittings & Custom Fabrications. Polyethylene fittings and custom fabrications shall be molded or fabricated by the pipe manufacturer. Butt fusion outlets shall be made to the same outside diameter, wall thickness, and tolerances as the mating pipe. All fittings and custom fabrications and connections shall be fully rated for the same internal pressure as the mating pipe. Pressure de-rated fabricated fittings are prohibited.

- 5. Molded Fittings. Molded fittings shall be manufactured in accordance with ASTM D 3261, Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing, and shall be so marked. Each production lot of molded fittings shall be subjected to the tests required under ASTM D 3261.

- 6. Fabricated Fittings. Fabricated fittings shall be made by heat fusion joining specially machine shapes cut from pipe, polyethylene sheet stock, or molded fittings. Fabricated fittings shall be rated for internal pressure service at least equal to the full service pressure rating of the mating pipe.

- 7. Polyethylene Flange Adapters. Flange adapters shall be made with sufficient through-bore length to be clamped in a butt fusion joining machine without the use of a stub-end holder.

- 8. Back-up Rings & Flange Bolts. Flange adapters shall be fitted with back-up rings pressure rated equal to or greater than the mating pipe. The back-up ring bore shall be chamfered or radiused to provide clearance to the flange adapter radius. Flange bolts and nuts shall be Grade 6 or higher (stainless steel).

- 9. Compliance Tests. Manufacturer's inspection and testing of the materials. In case of conflict with manufacturer's certifications, the Contractor, Project Engineer, or Owner may request retesting by the manufacturer or have retests performed by an outside testing service. All retesting shall be at the requestor's expense, and shall be performed in accordance with the Specifications.

E. Joining

1. Heat Fusion Joining. Joints between plain end pipes and fittings shall be made by butt fusion, electrofusion couplings and joints between the main and saddle branch fittings shall be made using saddle fusion procedures that are recommended by the pipe and fitting manufacturer. The Contractor shall ensure that persons making heat fusion joints have received training in the manufacturer's recommended procedure. The Contractor shall maintain records of trained personnel and shall certify that training was received not more than 12 months before commencing construction. External and internal beads shall not be removed.

2. Butt Fusion of Unlike Wall Thicknesses. Fusions of different wall thickness are acceptable, as long as the difference is limited to a one SDR difference, i.e. SDR 11 to SDR 9. Transitions between unlike wall thicknesses greater than one SDR shall be made with a transition nipple (a short length of the heavier wall pipe with one end machined to the lighter wall) or by mechanical means.

3. Joining by Other Means. Polyethylene pipe and fittings may be joined together or to other materials by means of (a) flanged connections (flange adapters and backup rings), (b) mechanical couplings designed for joining polyethylene pipe or for joining polyethylene pipe to another material, or (c) electrofusion. When joining by other means, the installation instructions of the joining device manufacturer shall be followed. All connections shall maintain the total pressure rating of the force main.

4. Mechanical Joint Installation. Mechanical joints shall be installed in accordance with the manufacturer's recommended procedure. When an OD compression mechanical coupling is used, a stiffener shall be installed in the bore of the polyethylene pipe.

5. Branch Connections. Branch connections to the main shall be made with saddle fittings or tees. Polyethylene saddle fittings shall be saddle fused to the main pipe.

SITE ENGINEER:



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

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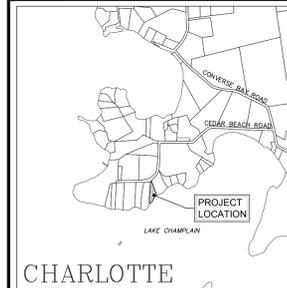
CLIENT:

ESTATE OF SHIRLEY L. BRUCE

PROJECT:

WASTEWATER SYSTEM

715 CEDAR BEACH ROAD CHARLOTTE, VT 05445



LOCATION MAP

1" = 200'

DATE	CHECKED	REVISION

SPECIFICATIONS

DATE

8/31/20

SCALE

NTS

PROJ. NO.

18198

4.02 HORIZONTAL DIRECTIONAL DRILLING W/ POLYETHYLENE PIPE

A. Directional boring with PE3408 pipe shall be completed in accordance with the manufacturer's requirements and shall not in any way affect the joint connections or the overall strength characteristics of the pipe.

B. References:

"Mini-Horizontal Directional Drilling Manual" published by North American Society for Trenchless Technology (NASTT).

"Guidelines for a Successful Directional Crossing Bid Package" published by Directional Crossing Contractors Association (DCCA).

"Polyethylene Pipe for Horizontal Directional Drilling" of the Plastic Pipe Institute's Handbook of Polyethylene Piping.

C. Quality Control. All directional boring shall be completed in such a way as not to jeopardize the existing infrastructure/facilities, such as the roadway, utility poles, subsurface utilities, structures/foundations, or significant landscaping. Prior to directional drilling, all potential conflicts shall be field verified.

D. General

1. Directional drilling shall be performed in a manner required to install HDPE utility line as indicated on the drawings. Furnish all manpower and equipment required to perform the pipeline installation. The operation shall include all excavation and dewatering, drilling calculations, pilot hole, and pullback operations. Contractor shall be responsible for type of reamer, diameter, and other pertinent operations required for a complete installation. Contractor shall be responsible for mobilizing on-site with a full range of drill stems and reaming heads to allow for various factors which may occur. Drill stems shall be of proper size and diameter to allow for full thrust and torque capabilities of the drilling machines.

2. Contractor shall perform utility survey to locate information concerning existing utility lines located in the areas of the directional drilling work.

3. Directional drilling shall be accomplished by drilling from one side of the crossing to the other using an approved method. One method shall be drilling a small diameter pilot hole along the proposed utility route. Steering shall be accomplished by using drilling mud which is pumped into the drill pipe to provide rotational energy in a drill bit at the end of the drill pipe. A jet bit shall force the mud through small orifices and jet away the earth and to allow the drilled path to curve in the proper direction as the drill pipe is thrust forward. An electronic survey instrument shall be placed inside the drill pipe head. The instrument shall signal a computer of the drilled paths magnetic azimuth, vertical inclination, and orientation of the bend. This data shall be used by the drilling contractor to calculate location of the drill bit and allow steering adjustments to be made.

4. After completing the pilot hole, larger diameter reaming heads shall be pulled back in order to enlarge the hole as required to allow for the pipe pullback. The Contractor shall be responsible for multiple reaming operations as required to complete the work. Pull back operations shall be carried out as soon as possible following the final pre-ream. During this phase of the work, the Contractor shall continue his work operations without interruption regardless of the day of week or hour of the day. A pullback head shall be attached to the pipe to allow fastening to the swivel head reamer. The head shall be closed to prevent drilling mud from entering the main during the pullback operation.

5. Upon completion of the drilling operations, the equipment and materials used shall be removed from the site and the areas disturbed shall be restored to original conditions. The main shall be tested in accordance with Section 02730 of the Specifications. If the main fails the testing, it shall be removed and the work repeated at no additional cost to the Owner.

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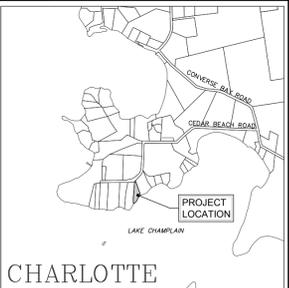
CLIENT:

**ESTATE OF SHIRLEY
L. BRUCE**

PROJECT:

**WASTEWATER
SYSTEM**

715 CEDAR BEACH ROAD
CHARLOTTE, VT 05445



CHARLOTTE
LOCATION MAP

1" = 2000'

DATE	CHECKED	REVISION

SPECIFICATIONS

DATE
8/31/20

SCALE

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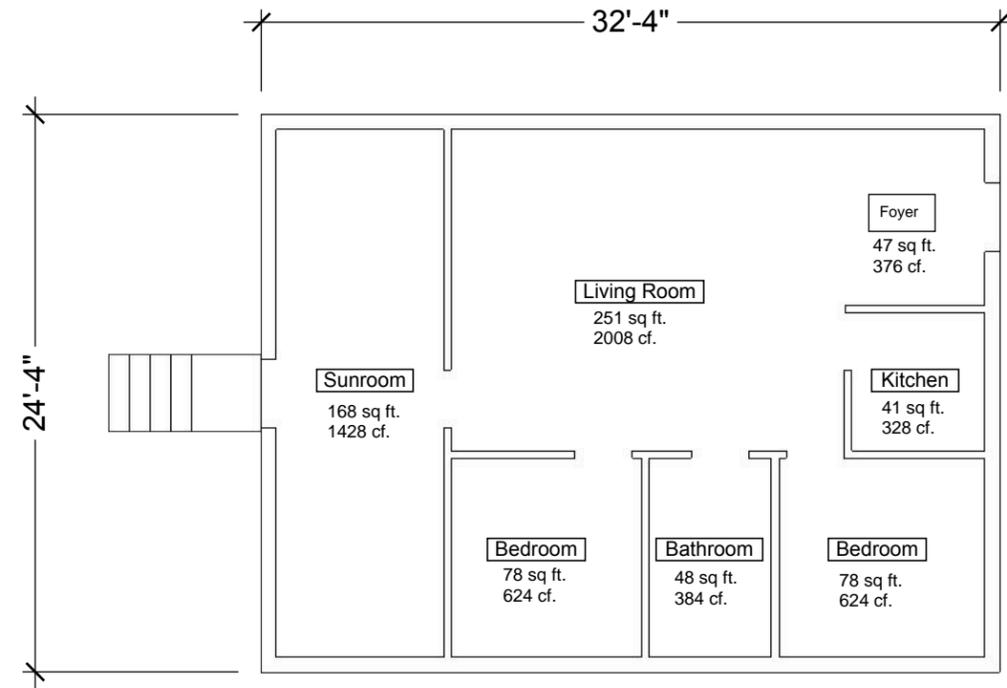
18198

DRAWING NUMBER

C3.1

Existing Floor Plan

Scale: 1/8"=1'-0"
 Total Sq Ft: 805
 Total Cubic Ft: 6,440



	Area (sf)	Volume (cf)
Living Room	251	2008
Sun Room	168	1428
Kitchen	41	328
Foyer	47	376
3/4 Bathroom	48	384
Bedroom 1	78	624
Bedroom 2	78	624
Existing Floor Total	711	5772



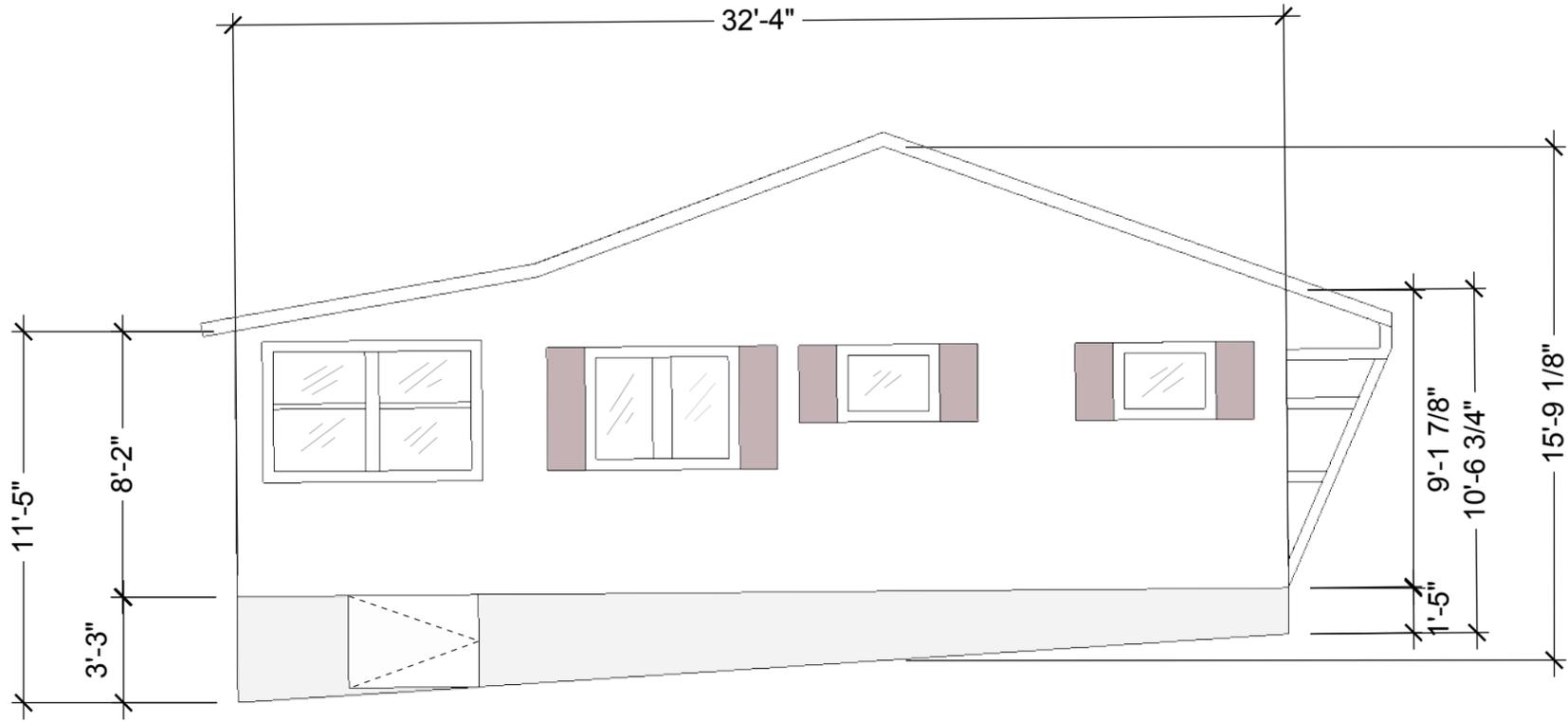
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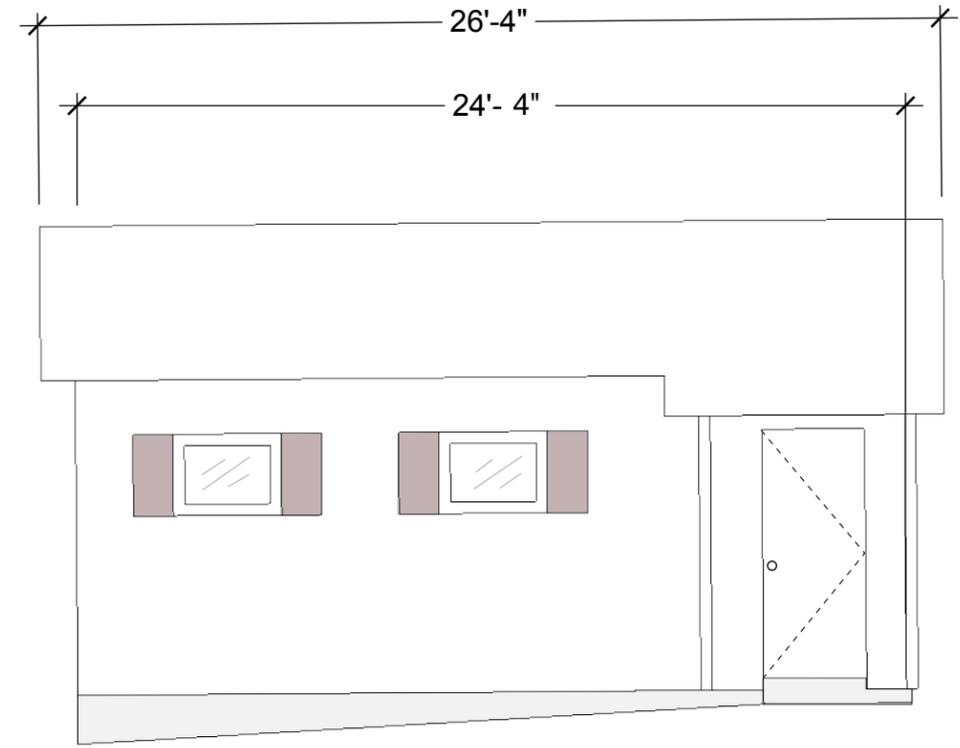
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PROJECT
 Goodwin - Charlotte
 Lake Home

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DESCRIPTION
 Existing Floor Plan



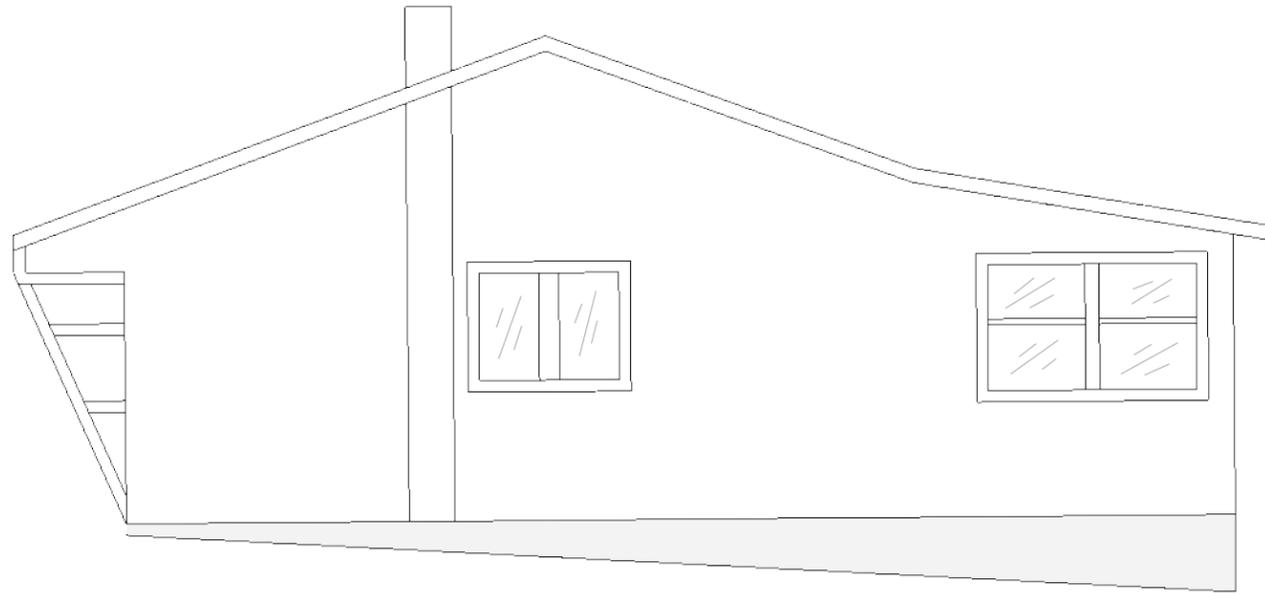
East Elevation

Scale: 3/16"=1' -0"



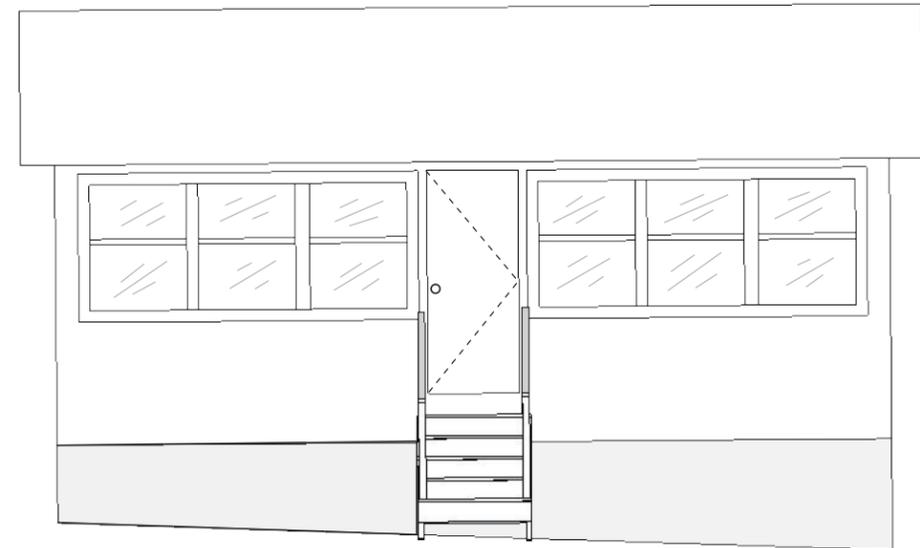
North Elevation

Scale: 3/16"=1' -0"



West Elevation

Scale: 3/16"=1' -0"



South Elevation

Scale: 3/16"=1' -0"

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Lake Home

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DESCRIPTION
Existing Elevations





East Elevation



North Elevation



West Elevation



South Elevation



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DESCRIPTION
 Existing Elevations
 Photos



First Floor Plan

Scale: 1/8"=1'-0"



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DESCRIPTION
 First Floor Plan

Second Floor Plan

Scale: 1/8"=1'-0"



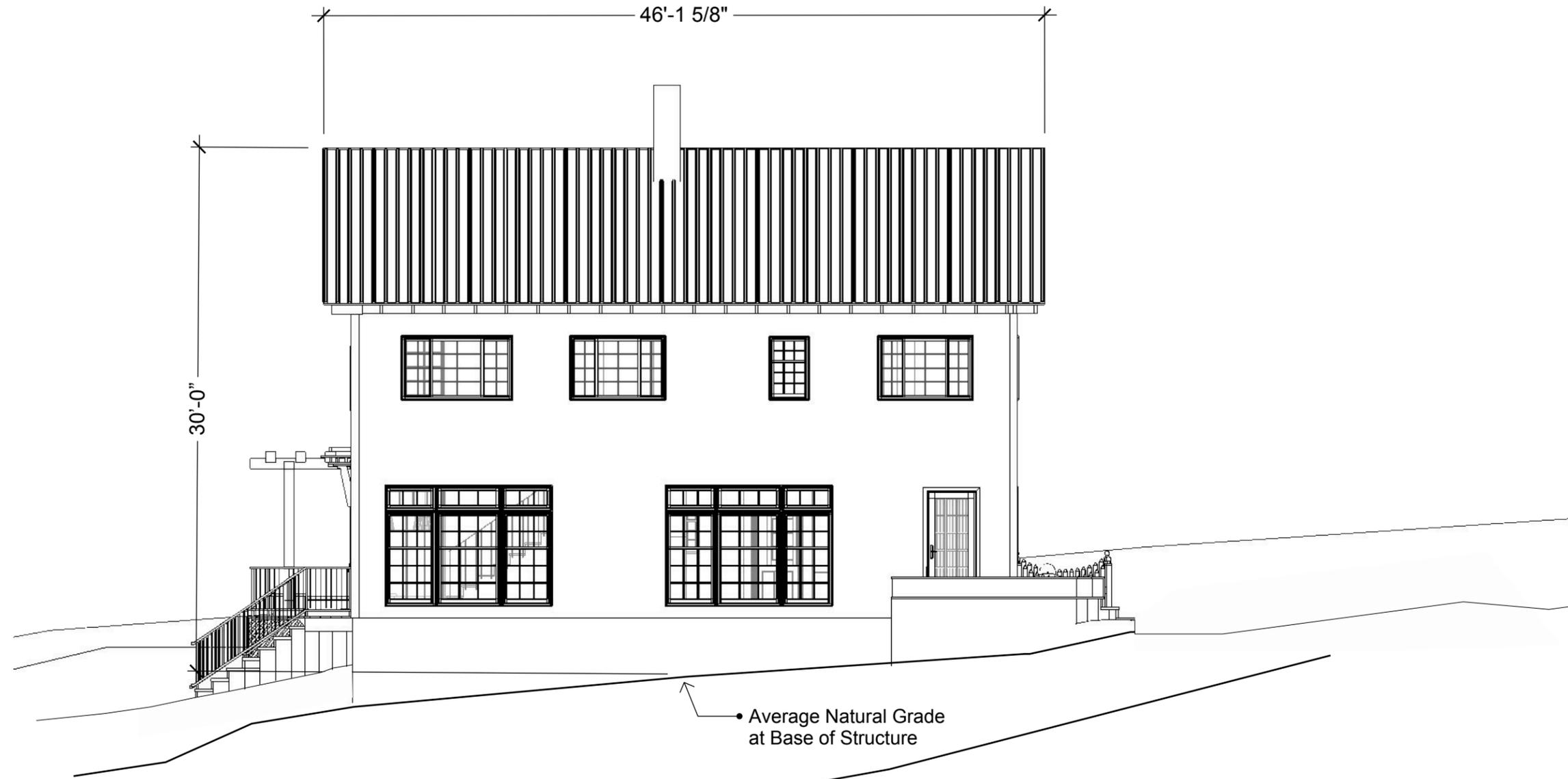
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DESCRIPTION
Second Floor Plan



East Elevation

Scale: 1/8"=1'-0"



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DESCRIPTION
 West Elevation

South Elevation

Scale: 1/8"=1'-0"



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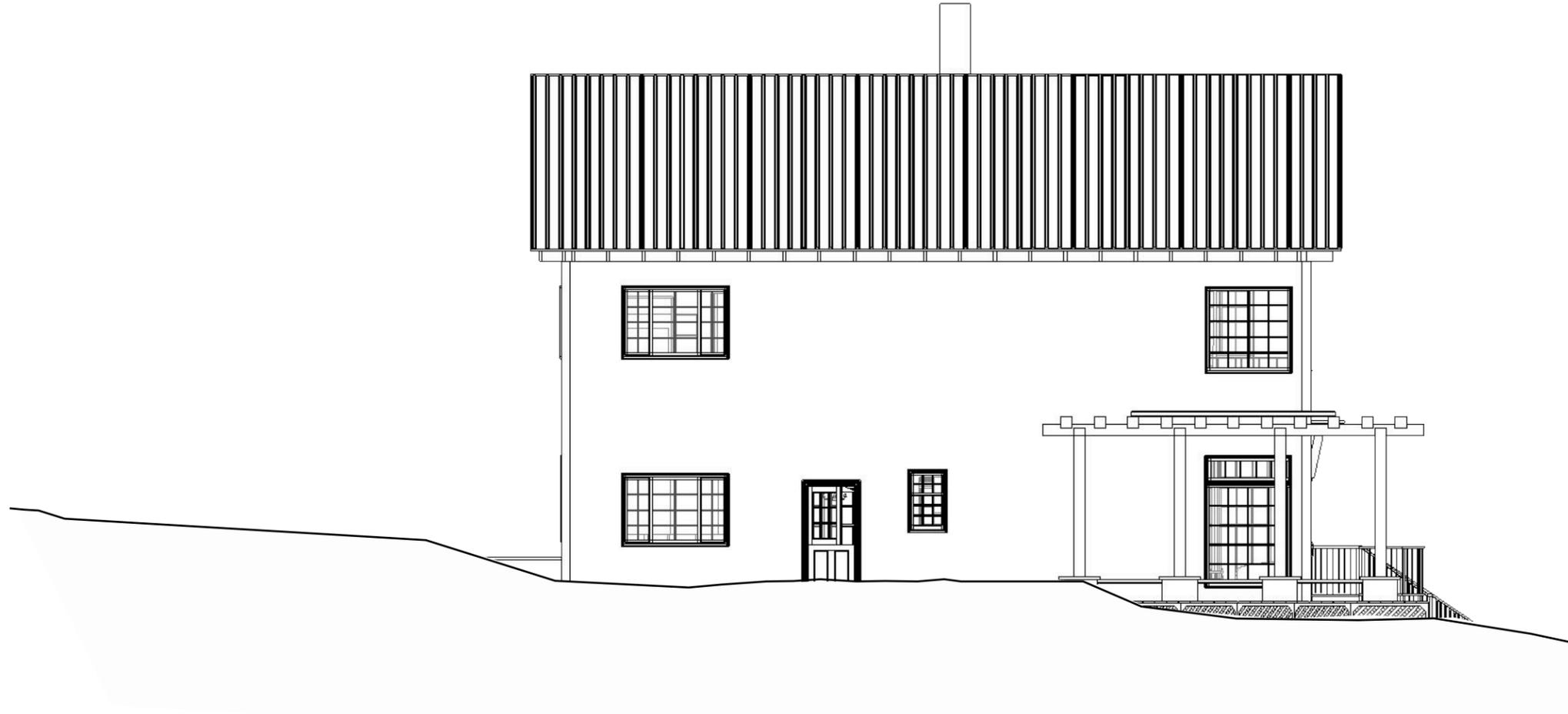
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JG
DESCRIPTION
North Elevation

a

04

West Elevation

Scale: 1/8"=1'-0"



a

05

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DESCRIPTION
East Elevation

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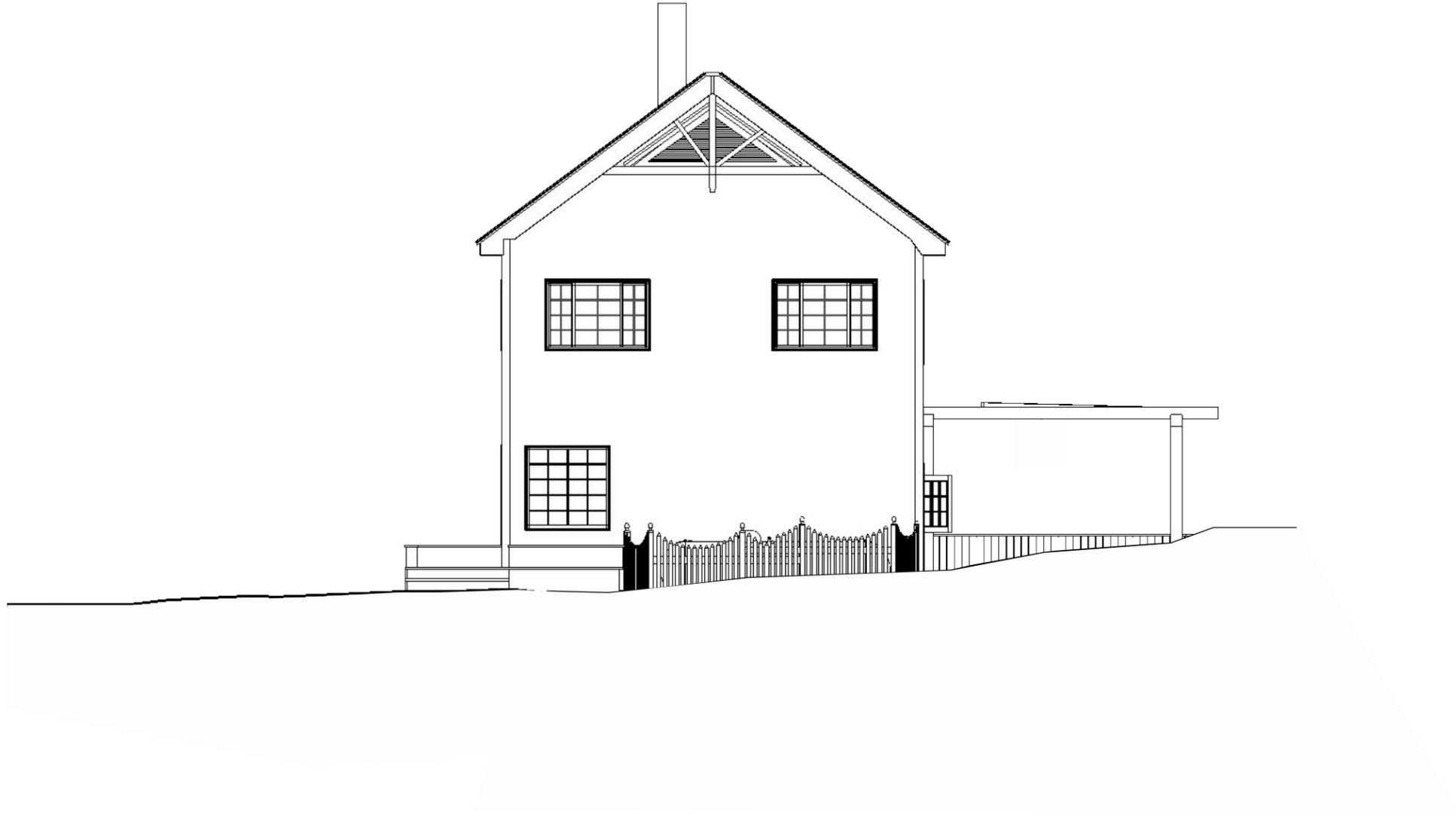
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Lake Home

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DESCRIPTION
South Elevation

a

06



North Elevation

Scale: 1/8"=1'-0"

Number	Room Name	Brand	Series	Window						Grilles						Hardware		Trim		
				Size		Type	Frame Material	Exterior Finish Color	Interior Finish Color	Pattern	Profile	Top Sash		Bottom Sash		Type	Finish	Size	Type	Finish Color
				Width	Height							Horizontal Lites	Vertical Lites	Horizontal Lites	Vertical Lites					
1	Den	Pella	Architect	20-5/8"	46 - 3/8"	Casement	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	2	5	N/A	N/A	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
2	Den	Pella	Architect	40-5/16"	46 - 3/8"	Double-Hung: Cottage Sash	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	2	3	3	3	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
3	Den	Pella	Architect	20-5/8"	46 - 3/8"	Casement	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	2	5	N/A	N/A	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
4	Bedroom	Pella	350 Series	70-13/16"	46 - 3/8"	Double Hung: Center Fixed with Flankers	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	2	2	2	2	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
5	Bedroom	Pella	350 Series	70-13/16"	46 - 3/8"	Double Hung: Center Fixed with Flankers	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	2	2	2	2	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
6	Stairway	Pella	Architect	56-11/16"	55 - 15/16"	Double Hung Fixed	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	4	5	N/A	N/A	N/A	N/A	1-5/8"	Brickmould	Fossil
7	Stairway	Pella	Architect	28-5/16"	46 - 1/4"	Double-Hung: Cottage Sash	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	2	3	3	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
8	Master Bedroom	Pella	350 Series	94-13/16"	46 - 1/4"	Double Hung: Center Fixed with Flankers	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	2	2	2	2	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
9	Master Bedroom	Pella	350 Series	82-13/16"	46 - 1/4"	Double Hung: Center Fixed with Flankers	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	2	2	2	2	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
10	Master Bathroom	Pella	350 Series	70-13/16"	46 - 1/4"	Double Hung: Center Fixed with Flankers	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	2	2	2	2	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
11	Bathroom	Pella	Architect	28-5/16"	46 - 1/4"	Double-Hung: Cottage Sash	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	2	3	3	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
12	Hall	Pella	350 Series	70-5/16"	46 - 1/4"	Double Hung: Center Fixed with Flankers	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	2	2	2	2	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
13	Den	Pella	Architect	40-5/16"	46 - 1/4"	Double-Hung: Cottage Sash	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	2	3	3	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
14	Den	Pella	Architect	40-5/16"	46 - 1/4"	Double-Hung: Cottage Sash	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	2	3	3	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
15	Den	Pella	Architect	40-5/16"	46 - 1/4"	Double-Hung: Cottage Sash	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	2	3	3	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
16	Kitchen	Pella	350 Series	70-13/16"	46 - 1/4"	Double Hung: Center Fixed with Flankers	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	2	2	2	2	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
17	Half Bathroom	Pella	Architect	29-5/16"	36 - 1/4"	Double-Hung: Cottage Sash	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	2	3	3	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
18	Stairway	Pella	Architect	56-11/16"	17-3/4"	Transom	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	4	1	N/A	N/A	N/A	N/A	1-5/8"	Brickmould	Fossil
19	Stairway	Pella	Architect	56-11/16"	67-15/16"	Double Hung Fixed	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	4	5	N/A	N/A	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
20	Living Room	Pella	Architect	31-1/4"	16-5/16"	Transom	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	2	1	N/A	N/A	N/A	N/A	1-5/8"	Brickmould	Fossil
21	Living Room	Pella	Architect	74-9/16"	16-5/16"	Transom	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	1	N/A	N/A	N/A	N/A	1-5/8"	Brickmould	Fossil
22	Living Room	Pella	Architect	31-1/4"	16-5/16"	Transom	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	2	1	N/A	N/A	N/A	N/A	1-5/8"	Brickmould	Fossil
23	Living Room	Pella	Architect	139-1/4"	80"	Series Reserve Sliding Door: French: 4 Panel	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	2	5	N/A	N/A	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
24	Living Room	Pella	Architect	36-5/16"	16-5/16"	Transom	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	1	N/A	N/A	N/A	N/A	1-5/8"	Brickmould	Fossil
25	Living Room	Pella	Architect	48-5/8"	16-5/16"	Transom	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	1	N/A	N/A	N/A	N/A	1-5/8"	Brickmould	Fossil
26	Living Room	Pella	Architect	36-5/16"	16-5/16"	Transom	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	1	N/A	N/A	N/A	N/A	1-5/8"	Brickmould	Fossil
27	Living Room	Pella	Architect	36-5/16"	70-1/4"	Double-Hung: Cottage Sash	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	2	3	3	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
28	Living Room	Pella	Architect	48-5/8"	70-1/4"	Double-Hung: Cottage Sash	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	2	3	3	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
29	Living Room	Pella	Architect	36-5/16"	70-1/4"	Double-Hung: Cottage Sash	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	2	3	3	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
30	Dining Room	Pella	Architect	36-5/16"	16-5/16"	Transom	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	1	N/A	N/A	N/A	N/A	1-5/8"	Brickmould	Fossil
31	Dining Room	Pella	Architect	48-5/8"	16-5/16"	Transom	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	1	N/A	N/A	N/A	N/A	1-5/8"	Brickmould	Fossil
32	Dining Room	Pella	Architect	36-5/16"	16-5/16"	Transom	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	1	N/A	N/A	N/A	N/A	1-5/8"	Brickmould	Fossil
33	Dining Room	Pella	Architect	36-5/16"	70-1/4"	Double-Hung: Cottage Sash	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	2	3	3	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
34	Dining Room	Pella	Architect	48-5/8"	70-1/4"	Double-Hung: Cottage Sash	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	2	3	3	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
35	Dining Room	Pella	Architect	36-5/16"	70-1/4"	Double-Hung: Cottage Sash	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	3	2	3	3	Essential Collection	Oil-Rubbed Bronze	1-5/8"	Brickmould	Fossil
36	Foyer	Pella	Architect	56 - 11/16"	55 - 15/16"	Double Hung Fixed	Aluminum Clad	Fossil	White	Traditional	3/4" Grilles-Between-the-Glass	4	5	N/A	N/A	N/A	N/A	1-5/8"	Brickmould	Fossil

Window Schedule

Scale: N/A



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PROJECT
Goodwin - Charlotte
Lake Home

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DESCRIPTION
Window Schedule

a

07



East Elevation- Rendered

Scale: 1/8"=1'-0"



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DESCRIPTION
 West Elevation-
 Rendered



South Elevation- Rendered

Scale: 1/8"=1' -0"



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 North Elevation-
 Rendered



West Elevation- Rendered

Scale: 1/8"=1'-0"



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 Tel: 802.922.6336

ISSUE
 June 4th, 2020
RE-ISSUE
 August 31st, 2020

PROJECT NO.
 H03.001
PROJECT
 Goodwin- Charlotte
 Lake Home

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 JG
DESCRIPTION
 East Elevation-
 Rendered



North Elevation- Rendered

Scale: 1/8"=1' -0"



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DESCRIPTION
 South Elevation-
 Rendered



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DESCRIPTION
 South Perspective

a

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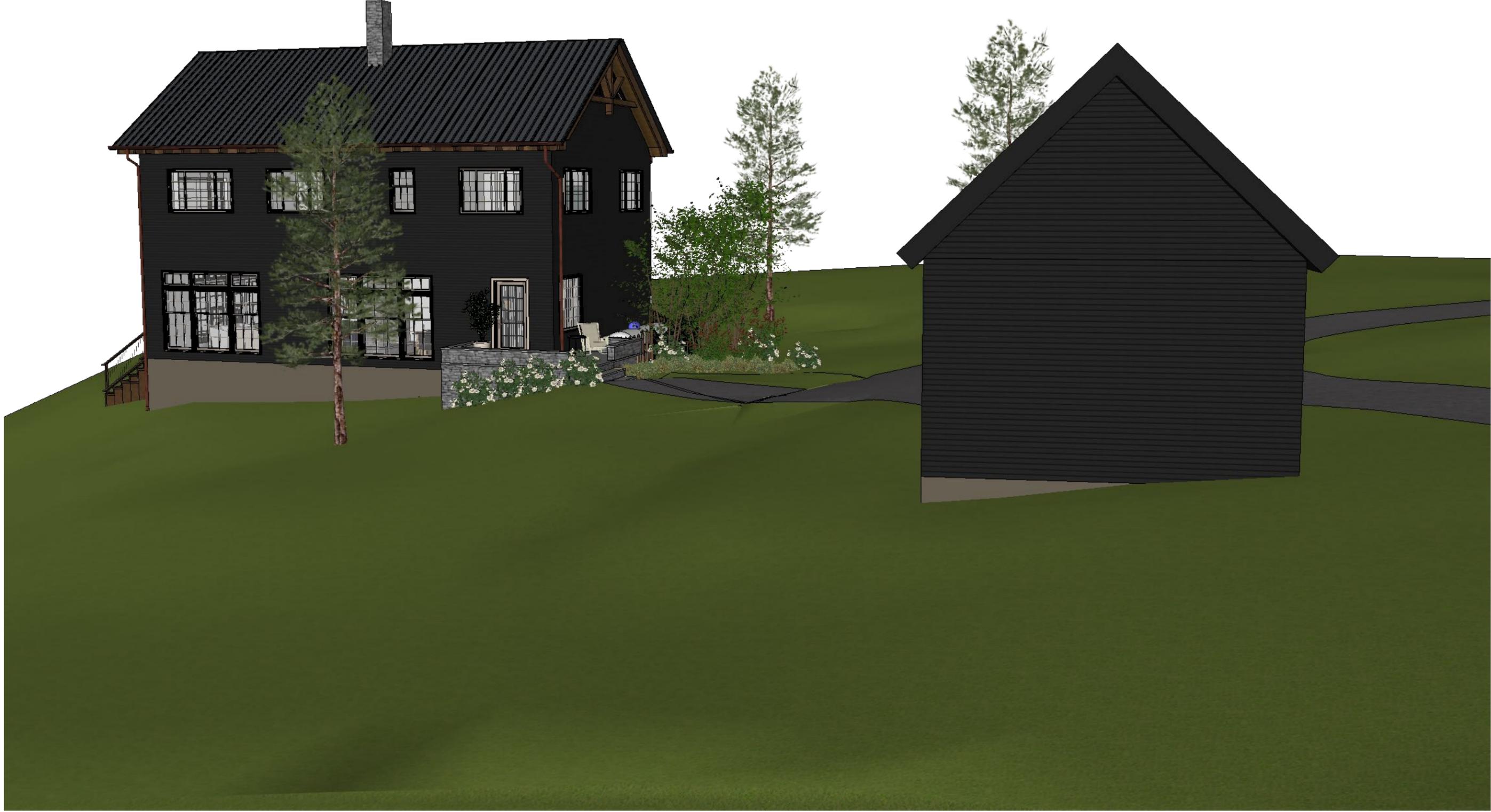
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DESCRIPTION
West Perspective

PROJECT NO.
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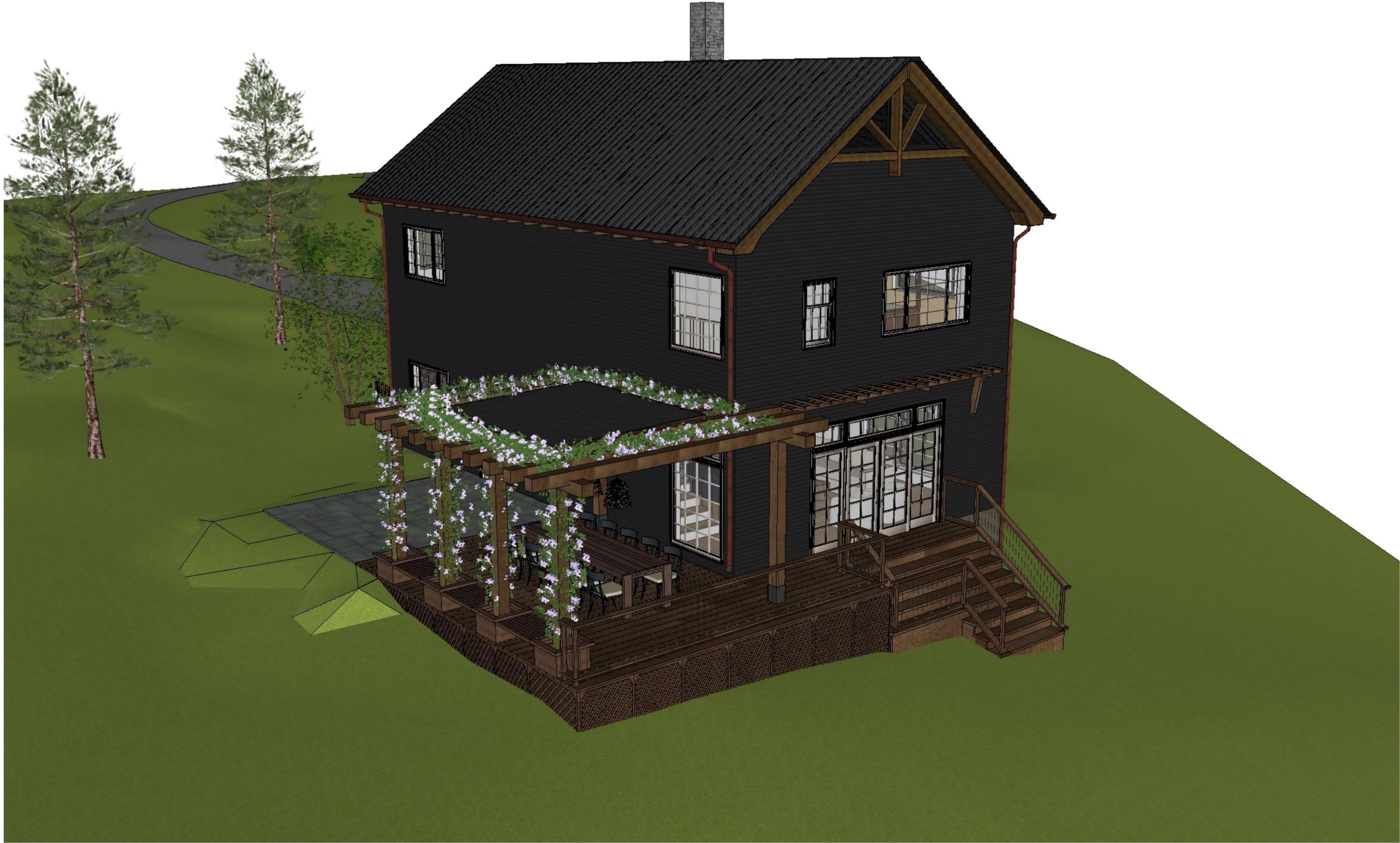
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DESCRIPTION
 East Perspective

a

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